

# DRAFT ENVIRONMENTAL IMPACT ASSESSMENT AND ENVIRONMENT MANAGEMENT PLAN

## FOR OBTAINING

**Environmental Clearance under EIA Notification – 2006**

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

**“B1” CATEGORY-MINOR MINERAL-CLUSTER-NONFOREST LAND-FRESH QUARRY**

**CLUSTER EXTENT = 36.38.21 hectares**

**At**

**Kundiathandalam and Poonathangal Village, Vembakkam Taluk,**

**Tiruvannamalai District, Tamil Nadu State**

TOR File No. 12483 and ToR Identification No. TO25B0108TN5856513N Dated: 25.09.2025

### NAME AND ADDRESS OF THE PROPOSED PROJECT PROPONENT

| Name and address                                                                                                                                                                | Extent & S.F.No.                                                                                                                                                                       | Production in m <sup>3</sup> & Tons                                                            |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------|
| M/s.Sri Kanniammal Blue Metals<br>Proprietor, Mr.K.Kumar,<br>S/o.Kannaiyan,<br>S.No.660/2A,2B,2D,660/1A,1B,<br>Aarpakkam Village,<br>Walajabad Taluk,<br>Kancheepuram District. | 3.38.58 ha &<br>S.F. Nos. 162/1, 162/2A,<br>162/2B, 162/3, 162/4,<br>162/5A, 162/5B, 162/6,<br>162/7, 162/8, 162/10A1,<br>162/10A2,162/10A3A,<br>162/10A3B,117/12A2,<br>144/1A, 144/2. | Rough stone<br>296860m <sup>3</sup> & 816368Ts<br><br>Gravel<br>82550m <sup>3</sup> & 165100Ts |

## ENVIRONMENTAL CONSULTANT

### GEO TECHNICAL MINING SOLUTIONS

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

Oddapatti, Collectorate Post office,

Dharmapuri-636705. Tamil Nadu.

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

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

NABET ACC. NO: NABET/EIA/23-26/RA 0319

Valid till: 31.12.2026

### ENVIRONMENTAL LAB

INTERSTELLAR TESTING CENTRE Pvt. Ltd

Plot.No.2, Site No.12/2A,

Industrial Estate, Perungudi, Chennai, Tamil Nadu

NABL Certificate Number:TC-6952, Valid Until : 30.07.2026.

**Baseline Study Period – Oct through Dec 2025**



## TERMS OF REFERENCE (ToR) COMPLIANCE

ToR File No.12483

ToR Identification No. TO25B0108TN5856513N, dated. 25/09/2025

M/s. Sri Kanniammal Blue Metals Rough Stone & Gravel Quarry

### 1. Seac Conditions - Site Specific

| S.No | Terms of Reference        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | Remarks                                                                                                                                                                                      |
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| 1.1  | <b>Major Condition</b>    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                                                                                                                                                                                              |
|      | 1                         | The PP shall leave 7.5m distance as safety barrier in case of patta land and 10m in case of government poramboke as per MMR, 1961 and the same shall be incorporated in the revised mining plan.                                                                                                                                                                                                                                                                                                                 | The safety barrier zones will be demarcated with permanent boundary pillars prior to commencement of mining operations, and no mining activity will be undertaken within these safety zones. |
|      | <b>Specific Condition</b> |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                                                                                                                                                                                              |
|      | 1                         | A Cluster Management Committee (CMC) shall be constituted including all the mines in the cluster as Committee Members for the effective management of the mining operation in the cluster through systematic & scientific approach with appointment of statutory personnel, appropriate environmental monitoring, good maintenance of haul roads and village/panchayat roads, authorized blasting operation etc. The PP shall submit the following details in the form of an Affidavit during the EIA appraisal: |                                                                                                                                                                                              |
|      | (i)                       | Copy of the agreement forming CMC.                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | The PP will form a CMC and submit the affidavit including these conditions during the final EIA appraisal meeting.                                                                           |
|      | (ii)                      | The Organization chart of the Committee with defining the role of the members                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                                                                                                                                                                              |
|      | (iii)                     | The 'Standard Operating Procedures' (SoP) executing the planned activities                                                                                                                                                                                                                                                                                                                                                                                                                                       |                                                                                                                                                                                              |
|      | 2                         | The PP should submit an affidavit to follow the scientific formation of benches for 5m x 5m                                                                                                                                                                                                                                                                                                                                                                                                                      | The Affidavit for scientific formation of benches will be included in final EIA report.                                                                                                      |

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|  |   | properly during mining as per the approved mining plan.                                                                                           |                                                                          |
|  | 3 | The PP shall ensure the installation of CCTV at the proposed quarry site and submit the photographic /video evidence during the EIA presentation. | The Photocopy of CCTV installation will be included in final EIA report. |

## 2. Seac Standard Conditions

| S.No | Terms of Reference |                                                                                                                                                                            | Remarks                                                        |
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| 2.1  | 1                  | In the case of existing/operating mines, a letter obtained from the concerned AD (Mines) shall be submitted and it shall include the following:                            | As it is a fresh quarry, these conditions are not applicable.  |
|      |                    | (i) Original pit dimension                                                                                                                                                 |                                                                |
|      |                    | (ii) Quantity achieved vs EC Approved Quantity                                                                                                                             |                                                                |
|      |                    | (iii) Balance Quantity as per Mineable Reserve calculated.                                                                                                                 |                                                                |
|      |                    | (iv) Mined out Depth as on date Vs EC Permitted depth                                                                                                                      |                                                                |
|      |                    | (v) Details of illegal/illicit mining                                                                                                                                      |                                                                |
|      |                    | (vi) Violation in the quarry during the past working.                                                                                                                      |                                                                |
|      |                    | (vii) Quantity of material mined out outside the mine lease area                                                                                                           |                                                                |
|      |                    | (viii) Condition of Safety zone/benches                                                                                                                                    |                                                                |
|      |                    | (ix) Revised/Modified Mining Plan showing the benches of not exceeding 6 m height and ultimate depth of not exceeding 50m.                                                 |                                                                |
|      | 2                  | Details of habitations around the proposed mining area and latest VAO certificate regarding the location of habitations within 300m radius from the periphery of the site. | The VAO certificate is attached as Annexure, page no-.330,331. |

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|  | 3 | The proponent is requested to carry out a survey and enumerate on the structures located within the radius of (i) 50 m, (ii) 100 m, (iii) 200 m and (iv) 300 m (v) 500m shall be enumerated with details such as dwelling houses with number of occupants, whether it belongs to the owner (or) not, places of worship, industries, factories, sheds, etc with indicating the owner of the building, nature of construction, age of the building, number of residents, their profession and income, etc. | There are no any structures or occupants or any sheds in 500m radius of the project site.              |
|  | 4 | The PP shall submit a detailed hydrological report indicating the impact of proposed quarrying operations on the waterbodies like lake, water tanks, etc are located within 1 km of the proposed quarry.                                                                                                                                                                                                                                                                                                 | Detailed hydrological study report will be submitted in the final EIA report.                          |
|  | 5 | The Proponent shall carry out Bio diversity study through reputed Institution and the same shall be included in EIA Report.                                                                                                                                                                                                                                                                                                                                                                              | The Bio-diversity study report from the reputed institution will be submitted in the final EIA report. |
|  | 6 | The DFO letter stating that the proximity distance of Reserve Forests, Protected Areas, Sanctuaries, Tiger reserve etc, up to a radius of 25 km from the proposed site.                                                                                                                                                                                                                                                                                                                                  | The DFO letter will be submitted in the final EIA report.                                              |
|  | 7 | In the case of proposed lease in an existing (or old) quarry where the benches are not formed (or) partially formed as per the approved Mining Plan, the Project Proponent (PP) shall the PP shall carry out the scientific studies to assess the slope                                                                                                                                                                                                                                                  | This is a fresh lease area, no benches are formed.                                                     |



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|  |    | stability of the working benches to be constructed and existing quarry wall, by involving any one of the reputed Research and Academic Institutions - CSIR-Central Institute of Mining & Fuel Research / Dhanbad, NIRM/Bangalore, Division of Geotechnical Engineering-IIT-Madras, NIT-Dept of Mining Engg, Surathkal, and Anna University Chennai-CEG Campus. The PP shall submit a copy of the aforesaid report indicating the stability status of the quarry wall and possible mitigation measures during the time of appraisal for obtaining the EC. |                                                                                                                 |
|  | 8  | However, in case of the fresh/virgin quarries, the Proponent shall submit a conceptual 'Slope Stability Plan' for the proposed quarry during the appraisal while obtaining the EC, when the depth of the working is extended beyond 30 m below ground level.                                                                                                                                                                                                                                                                                             | This is a fresh lease area; the Slope Stability report will be submitted once the mining depth reaches 30m BGL. |
|  | 9  | The PP shall furnish the affidavit stating that the blasting operation in the proposed quarry is carried out by the statutory competent person as per the MMR 1961 such as blaster, mining mate, mine foreman, II/I Class mines manager appointed by the proponent.                                                                                                                                                                                                                                                                                      | The affidavit for blasting will be enclosed in the final EIA report.                                            |
|  | 10 | The PP shall present a conceptual design for carrying out only controlled blasting operation involving line drilling and muffle blasting in the proposed quarry such that the blast-induced ground vibrations are                                                                                                                                                                                                                                                                                                                                        | A conceptual design of blasting has given in Section 2.5.1 under Chapter II in the EIA report page 16-18.       |

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|  |    | controlled as well as no fly rock travel beyond 30 m from the blast site.                                                                                                                                        |                                                                     |
|  | 11 | The EIA Coordinators shall obtain and furnish the details of quarry/quarries operated by the proponent in the past, either in the same location or elsewhere in the State with video and photographic evidences. | This is the only quarry in name of the lessee.                      |
|  | 12 | If the proponent has already carried out the mining activity in the proposed mining lease area after 15.01.2016, then the proponent shall furnish the following details from AD/DD, mines,                       | Not applicable, it is a fresh quarry lease.                         |
|  | 13 | What was the period of the operation and stoppage of the earlier mines with last work permit issued by the AD/DD mines?                                                                                          | As it is a fresh quarry lease, these conditions are not applicable. |
|  | 14 | Quantity of minerals mined out.                                                                                                                                                                                  |                                                                     |
|  |    | <ul style="list-style-type: none"> <li>Highest production achieved in any one year.</li> </ul>                                                                                                                   |                                                                     |
|  |    | <ul style="list-style-type: none"> <li>Detail of approved depth of mining.</li> </ul>                                                                                                                            |                                                                     |
|  |    | <ul style="list-style-type: none"> <li>Actual depth of the mining achieved earlier.</li> </ul>                                                                                                                   |                                                                     |
|  |    | <ul style="list-style-type: none"> <li>Name of the person already mined in that leases area.</li> </ul>                                                                                                          |                                                                     |
|  |    | <ul style="list-style-type: none"> <li>If EC and CTO already obtained, the copy of the same shall be submitted.</li> </ul>                                                                                       |                                                                     |
|  |    | <ul style="list-style-type: none"> <li>Whether the mining was carried out as per the approved mine plan (or EC if issued) with stipulated benches.</li> </ul>                                                    |                                                                     |
|  | 15 | All corner coordinates of the mine lease area, superimposed on a High-Resolution                                                                                                                                 | All corner coordinates of the mine lease area have been             |

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|  |    | Imagery/Toposheet, topographic sheet, geomorphology, lithology and geology of the mining lease area should be provided. Such an Imagery of the proposed area should clearly show the land use and other ecological features of the study area (core and buffer zone).                              | superimposed on a high-resolution Google Earth Image, as shown in Figure 2.2 under Chapter II in the EIA report page 10.                                                                                                                                                             |
|  | 16 | The PP shall carry out Drone video survey covering the cluster, green belt, fencing, etc.                                                                                                                                                                                                          | The drone video will be submitted during final presentation.                                                                                                                                                                                                                         |
|  | 17 | The proponent shall furnish photographs of adequate fencing, green belt along the periphery including replantation of existing trees & safety distance between the adjacent quarries & water bodies nearby provided as per the approved mining plan.                                               | Photographs of adequate fencing, green belt along the periphery of the project area and the photographs showing nearby water bodies will be included in final EIA Presentation.                                                                                                      |
|  | 18 | The Project Proponent shall provide the details of mineral reserves and mineable reserves, planned production capacity, proposed working methodology with justifications, the anticipated impacts of the mining operations on the surrounding environment, and the remedial measures for the same. | The Resources and Reserves of Rough Stone were calculated based on cross-section method by plotting sections to cover the maximum lease area for the proposed project.<br><br>The details reserve estimation has been shown in Table 2.5 under Chapter II in the EIA report page 13. |
|  | 19 | The Project Proponent shall provide the Organization chart indicating the appointment of various statutory officials and other competent persons to be appointed as per the provisions of the Mines Act'1952                                                                                       | The chart including the role of statutory officials is prepared and given in section -2.8, page no-24.                                                                                                                                                                               |

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|  |    | and the MMR, 1961 for carrying out the quarrying operations scientifically and systematically in order to ensure safety and to protect the environment.                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                                                                                                                                                                                                                              |
|  | 20 | The Project Proponent shall conduct the hydro-geological study considering the contour map of the water table detailing the number of groundwater pumping & open wells, and surface water bodies such as rivers, tanks, canals, ponds, etc. within 1 km (radius) along with the collected water level data for both monsoon and non-monsoon seasons from the PWD / TWAD so as to assess the impacts on the wells due to mining activity. Based on actual monitored data, it may clearly be shown whether working will intersect groundwater. Necessary data and documentation in this regard may be provided. | The hydro-geological study is discussed in the Section 3.2.2 under Chapter III in the EIA report page 46-55.                                                                                                                 |
|  | 21 | The proponent shall furnish the baseline data for the environmental and ecological parameters with regard to surface water/ground water quality, air quality, soil quality & flora/fauna including traffic/vehicular movement study.                                                                                                                                                                                                                                                                                                                                                                          | The baseline data was collected for the environmental components including land, soil, water, air, noise, biology, socio-economy, and traffic and the results have been discussed in Chapter III of EIA report, page 25-103. |
|  | 22 | The Proponent shall carry out the Cumulative impact study due to mining operations carried out in the quarry specifically with reference to the specific                                                                                                                                                                                                                                                                                                                                                                                                                                                      | Results of cumulative impact study due to mining operations are given in Section 7.4 under                                                                                                                                   |

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|  |    | 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.                                                                                                                                                          | Chapter VII in the EIA report page 138-152.                                                                                                                                                                                                                                                                                                                                                                 |
|  | 23 | Rain water harvesting management with recharging details along with water balance (both monsoon & non-monsoon) be submitted.                                                                                                                                                                                                                                                                                                             | As part of rainwater harvesting measures, the rain water from garland drainage system will be diverted to nearby check dams after treating the water in settling tanks.<br><br>The detailed rain water harvesting along with water balance is discussed in Section- 3.2.3.1 Chapter III, page- 47-49.                                                                                                       |
|  | 24 | Land use of the study area delineating forest area, agricultural land, grazing land, wildlife sanctuary, national park, migratory routes of fauna, water bodies, human settlements and other ecological features should be indicated. Land use plan of the mine lease area should be prepared to encompass preoperational, operational and post operational phases and submitted. Impact, if any, of change of land use should be given. | Land use of the study area delineating forest area, agricultural land, grazing land, wildlife sanctuary, national park, migratory routes of fauna, water bodies, human settlements and other ecological features has been discussed in Section 3.1.2 under Chapter III in the EIA report page 27-29.<br><br>The details of surrounding sensitive ecological features have been provided in Table 3.36 under |

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|    |                                                                                                                                                                                                                                                                                                                                                                                                              | Chapter III in the EIA report page 102.<br><br>Land use plan of the project area showing pre-operational, operational and post-operational phases are discussed in Table 2.9 under Chapter II in the EIA report page 19. |
| 25 | Details of the land for storage of Overburden/Waste Dumps (or) Rejects outside the mine lease, such as extent of land area, distance from mine lease, its land use, R&R issues, if any, should be provided.                                                                                                                                                                                                  | The rough stone is of 100% recovery without any wastes or rejects. So, no dumps have been proposed inside or outside the lease area. Hence, R&R may not require.                                                         |
| 26 | Proximity to Areas declared as 'Critically Polluted' (or) the Project areas which attracts the court restrictions for mining operations, should also be indicated and where so required, clearance certifications from the prescribed Authorities, such as the TNPCB (or) Dept. of Geology and Mining should be secured and furnished to the effect that the proposed mining activities could be considered. | Not Applicable.<br><br>Project area / Study area is not declared in 'Critically Polluted' Area.                                                                                                                          |
| 27 | Description of water conservation measures proposed to be adopted in the Project should be given. Details of rainwater harvesting proposed in the Project, if any, should be provided.                                                                                                                                                                                                                       | As part of rainwater harvesting measures, the rain water from garland drainage system will be diverted to nearby check dams after treating the water in settling tanks.                                                  |

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| 28 | Impact on local transport infrastructure due to the Project should be indicated.                                                                                                                                                                                                                           | Details regarding impact of the project on traffic and transport infrastructure are given in Section 3.7 under Chapter III in the EIA report page 99-101.                                                                |
| 29 | A tree survey study shall be carried out (nos., name of the species, age, diameter etc.,) both within the mining lease applied area & 300m buffer zone and its management during mining activity.                                                                                                          | A detailed tree survey was carried out within 300 m radius and the results have been discussed in Section 3.5 under Chapter III in the EIA report page 70-80.                                                            |
| 30 | A detailed mine closure plan for the proposed project shall be included in EIA/EMP report which should be site-specific.                                                                                                                                                                                   | A progressive mine closure plan has given in section 4.10, chapter IV, page-125,126.<br><br>The budget details for the progressive mine closure plan are shown in Table 10.1 under Chapter X in the EIA report page 164. |
| 31 | As a part of the study of flora and fauna around the vicinity of the proposed site, the EIA coordinator shall strive to educate the local students on the importance of preserving local flora and fauna by involving them in the study, wherever possible.                                                | The EIA coordinator and the FAE for ecology and biodiversity visited the study area and educated the local students about the importance of protecting the biological environment.                                       |
| 32 | The purpose of green belt around the project is to capture the fugitive emissions, carbon sequestration and to attenuate the noise generated, in addition to improving the aesthetics. A wide range of indigenous plant species should be planted as given in the appendix-I in consultation with the DFO, | A detailed greenbelt development plan has been provided in Table 4.13, 4.14 under Chapter IV in the EIA report page 121.                                                                                                 |

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|  |    | State Agriculture University. The plant species with dense/moderate canopy of native origin should be chosen. Species of small/medium/tall trees alternating with shrubs should be planted in a mixed manner.                                                                                                                                                                                                       |                                                                                                                                                                                                                                                                                                                                                                                                       |
|  | 33 | Taller/one year old Saplings raised in appropriate size of bags; preferably ecofriendly bags should be planted as per the advice of local forest authorities/botanist/Horticulturist with 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.<br><br>The green belt development plan including planting procedure is discussed in page- 121 |
|  | 34 | A Disaster management Plan shall be prepared and included in the EIA/EMP Report for the complete life of the proposed quarry (or) till the end of the lease period.                                                                                                                                                                                                                                                 | The disaster management plan for the project has been prepared and provided in Section 7.3 under Chapter VII in the EIA report page 136,137.                                                                                                                                                                                                                                                          |
|  | 35 | A Risk Assessment and management Plan shall be prepared and included in the EIA/EMP Report for the complete life of the proposed quarry (or) till the end of the lease period.                                                                                                                                                                                                                                      | Risk assessment plan for the project has been prepared and provided in Section 7.2 under Chapter VII in the EIA report page 133-136.                                                                                                                                                                                                                                                                  |
|  | 36 | Occupational Health impacts of the Project should be anticipated and the proposed preventive measures spelt out in detail.                                                                                                                                                                                                                                                                                          | Occupational health impacts of the project and preventive measures have been discussed in                                                                                                                                                                                                                                                                                                             |



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|  |    | 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.                                                                                       | detail in Section 4.8 under Chapter IV in the EIA report 123-125.                                                                                                                                                                                                             |
|  | 37 | Public health implications of the Project and related activities for the population in the impact zone should be systematically evaluated and the proposed remedial measures should be detailed along with budgetary allocations.                                                                                                                     | No public health implications are anticipated due to this project. Details of CSR and CER activities have been discussed in Sections 8.6 and 8.7 under Chapter VIII in the EIA report page 154,155.                                                                           |
|  | 38 | The Socio-economic studies should be carried out within a 5 km buffer zone from the mining activity. Measures of socio-economic significance and influence to the local community proposed to be provided by the Project Proponent should be indicated. As far as possible, quantitative dimensions may be given with time frames for implementation. | No negative impact on socio-economic environment of the study area is anticipated and this project shall benefit the socio-economic environment by offering employment for 22 people directly as discussed in Section 8.1, 8.2 under Chapter VIII in the EIA report page 153. |
|  | 39 | Details of litigation pending against the project, if any, with direction /order passed by any Court of Law against the Project should be given.                                                                                                                                                                                                      | No litigation is pending in any court against this project.                                                                                                                                                                                                                   |
|  | 40 | Benefits of the Project if the Project is implemented should be spelt out. The benefits of the Project shall clearly indicate                                                                                                                                                                                                                         | The benefits of the project in all these aspects are discussed in the Chapter VIII in the EIA report page 153-155.                                                                                                                                                            |

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|  |    | environmental, social, economic, employment potential, etc.                                                                                                                                                                                                                                                                                  |                                                                                                                                                                                                                                                                                                      |
|  | 41 | If any quarrying operations were carried out in the proposed quarrying site for which now the EC is sought, the Project Proponent shall furnish the detailed compliance to EC conditions given in the previous EC with the site photographs which shall duly be certified by MoEF&CC, Regional Office, Chennai (or) the concerned DEE/TNPCB. | It is fresh lease area and the condition is not applicable.                                                                                                                                                                                                                                          |
|  | 42 | The PP shall prepare the EMP for the entire life of mine and also furnish the sworn affidavit stating to abide the EMP for the entire life of mine.                                                                                                                                                                                          | A detailed environment management plan has been prepared following the suggestion made by SEAC, is added as Chapter X in the EIA report page 157-164.<br><br>The sworn affidavit stating to abide the EMP for the entire life of mine will be submitted in final EIA report.                         |
|  | 43 | Concealing any factual information or submission of false/fabricated data and failure to comply with any of the conditions mentioned above may result in withdrawal of this Terms of Conditions besides attracting penal provisions in the Environment (Protection) Act, 1986.                                                               | This EIA report has been prepared keeping in mind that, fact 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 |

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|  |  | Environment (Protection) Act, 1986. |
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### 3. Seiaa Specific Conditions

| S.No | Terms of Reference                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | Remarks                                                                                                                                                                                                           |
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| 3.1  | The authority noted that the subject was placed in the 609th SEAC-I meeting held on 26.08.2025. After detailed discussions, the Authority accepts the recommendation of SEAC-I and decided to grant Terms of Reference (ToR) along with Public Hearing for the quantity of 381425 m <sup>3</sup> of Rough Stone & 89610 m <sup>3</sup> of Gravel up to the depth of 50m (BGL) as per the approved mining plan, 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-I & normal conditions & the SEIAA Standard conditions. | The proponent thanking the authorities for granting the ToR with Public Hearing. (Revised proposed production and depth)<br><br>Will undergo a combined EIA study and prepare the EMP as per the recommendations. |

### 4. Seiaa Standard Conditions:

| S.No | Terms of Reference                  |                                                                                                                                                                 | Remarks                                                                                           |
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|      | <b>Cluster Management Committee</b> |                                                                                                                                                                 |                                                                                                   |
| 4.1  | 1                                   | Cluster Management Committee shall be framed which must include all the proponents in the cluster as members including the existing as well as proposed quarry. | A cluster management committee including all the proponents will be constituted by the proponent. |

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|  | 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 coordinate among themselves in effective implementation of EMP.                                                                                                                        |
|  | 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 and updated every year.                                                                                                      |
|  | 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.                                                         | The plan has prepared and information regarding haul roads as route map and network has been discussed in Section 2.5.2 under Chapter II in the EIA report page 18-19.                                                                      |
|  | 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.                                         | The committee will frame the risk management plan including the evacuation plan in a holistic manner.<br><br>However, quarrying will be stopped during the rainy conditions.                                                                |
|  | 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 in the EIA report. | It will be advised by the proponent 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 |

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|  |                                            |                                                                                                                                                                  | 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. | The proper action plan regarding the restoration will be framed and followed by the committee.                                                                                                                                                                                                                        |
|  | 8                                          | The committee shall deliberate on the health of the workers/staff involved in the mining as well as the health of the public in the vicinity.                    | The health status of workers and the local people will be monitored and updated periodically.                                                                                                                                                                                                                         |
|  | <b>Agriculture &amp; Agro-Biodiversity</b> |                                                                                                                                                                  |                                                                                                                                                                                                                                                                                                                       |
|  | 9                                          | 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 4.6.4 under Chapter IV in the EIA report page 122. |
|  | 10                                         | Impact on soil, flora & vegetation around the project site.                                                                                                      | The details on flora have been provided in Section 3.5 under Chapter III in the EIA report page 70-80.<br><br>There is no schedule I species of animals observed within study area. There is no endangered red list species found in the study area.                                                                  |

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|  | 11             | Details of type of vegetations including no. of trees & shrubs within the proposed mining area and. If so, transplantation of such vegetations all along the boundary of the proposed mining area shall committed mentioned in EMP. | Details of vegetation in the lease area have been provided in Section 3.5 under Chapter III in the EIA report page-70-80. Details about transplantation of plants have been provided in Section 4.6.2 under Chapter IV in the EIA report page 120,121. |
|  | 12             | 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 impacts and measures have been provided in Section 4.6 under Chapter IV in the EIA report page 120-122.                                                                                                                                 |
|  | 13             | Action should specifically suggest for sustainable management of the area and restoration of ecosystem for flow of goods and services.                                                                                              | All the essential environmental protective measures will be followed by the proponent to manage the surrounding environment and restore the ecosystem, as discussed in Chapter IV in the EIA report page 104-126.                                      |
|  | 14             | 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 in the EIA report page 105,106.                                                                                                                       |
|  | <b>Forests</b> |                                                                                                                                                                                                                                     |                                                                                                                                                                                                                                                        |
|  | 15             | The project proponent shall detail study on impact of mining on Reserve forests free ranging wildlife.                                                                                                                              | The project proponent will do barbed wire fencing work around the lease area to prevent wildlife from entering the site.                                                                                                                               |

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|  |                          |                                                                                                                                                                  | A full-time watchman has been appointed in advance to restrict the movements of the local people nearby the quarry site.                                                                                                          |
|  | 16                       | 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 in the EIA report page 120-122.                                                                                        |
|  | 17                       | 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 in the EIA report page 120,121.                                                                           |
|  | 18                       | The Environmental Impact Assessment should study impact on protected areas, Reserve Forests, National Parks, Corridors and Wildlife pathways, near project site. | There are no such areas nearby project site. Protected areas, National Parks, Corridors and Wildlife pathways near project site within 10 km radius has been provided in Table 3.36 under Chapter III in the EIA report page 102. |
|  | <b>Water Environment</b> |                                                                                                                                                                  |                                                                                                                                                                                                                                   |

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|  | 19 | 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. | The detailed hydro-geological study is carried out and results are discussed in chapter-III of EIA report page-46-55.                                                                                                                               |
|  | 20 | Erosion Control measures.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | Garland drainage structures will be constructed around the lease area to control the erosion and afforestation will be done in order to restore the stability of the terrain, discussed in Section 4.6 under Chapter IV in the EIA report page 121. |
|  | 21 | 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 impacts have been discussed and provided in Chapter IV of EIA report page 104-126.                                                                                                                                                              |
|  | 22 | 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 discussed in Section 3.5.3 under Chapter 3 in the EIA report page 84.                                                                                                                            |



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|  | 23 | 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 are discussed in Chapter IV in the EIA report page 104-126.                                                                                                                                  |
|  | 24 | 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 3.5.3 under Chapter III in the EIA report page 84.                                                                                               |
|  | 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 in the EIA report page 106,107.                                                                                                                                     |
|  | 26 | 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 in the EIA report page 107-109.                                                                                                                                 |
|  | 27 | The EIA shall include the impact of mining activity on the following:                                                                                                                                                                                                 |                                                                                                                                                                                                                                                                 |
|  |    | a. Hydrothermal / Geothermal effect due to destruction in the Environment.                                                                                                                                                                                            | The average geothermal gradient of earth is 25 <sup>0</sup> C/km. As the proposed depth of mining is 45m below the local ground level, the temperature will increase by 1.25 <sup>0</sup> C at the depth of mining. So, there will be no effect on environment. |

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|  |                       | b. Bio-geochemical processes and its foot prints including environmental stress.                                                                                                                                                                                               | No Bio-geochemical processes are anticipated as the quarrying is of hard rock type.<br><br>At the end of life of mine, the proposed quarry shall be left as an artificial reservoir structure to collect rain water and will enrich the ecosystem. |
|  |                       | c. Sediment geochemistry in the surface streams                                                                                                                                                                                                                                | There will be no effect on sediment geochemistry and are discussed in the Table 3.4 under Chapter III in the EIA report page 41.                                                                                                                   |
|  | <b>Energy</b>         |                                                                                                                                                                                                                                                                                |                                                                                                                                                                                                                                                    |
|  | 28                    | The measures taken to control Noise, Air, Water, Dust Control and steps adopted to efficiently utilize the Energy shall be furnished.                                                                                                                                          | The measures taken to control noise, air, water, and dust are furnished in Chapter IV of the EIA report page 107-119.                                                                                                                              |
|  | <b>Climate Change</b> |                                                                                                                                                                                                                                                                                |                                                                                                                                                                                                                                                    |
|  | 29                    | The Environmental Impact Assessment shall study in detail the carbon emission and also suggest the measures to mitigate carbon emission including development of carbon sinks and temperature reduction including control of other emission and climate mitigation activities. | The carbon emission and the measures to mitigate carbon emission have been discussed in Section 4.6 under Chapter IV in the EIA report page 120,121.                                                                                               |
|  | 30                    | The Environmental Impact Assessment should study impact on climate change, temperature rise, pollution and above soil & below soil carbon stock, soil health and physical, chemical & biological soil features.                                                                | Those aspects have been discussed in Chapter IV of the EIA report page 106,107.                                                                                                                                                                    |

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|  | 31                       | Impact of mining on pollution leading to GHGs emissions and the impact of the same on the local livelihood.                                                                        | There will be no such emission impact to local livelihood from this quarry project. All the vehicles used for transportation of the quarry materials will be maintained regularly to keep the GHGs emission within statutory limits.   |
|  | <b>Mine Closure Plan</b> |                                                                                                                                                                                    |                                                                                                                                                                                                                                        |
|  | 32                       | Detailed Mine Closure Plan covering the entire mine lease period as per precise area communication order issued.                                                                   | This is a fresh lease; a progressive mine closure plan has been given in chapter IV, page-125,126.<br><br>The budget details for the progressive mine closure plan are shown in Table 10.1 under Chapter X in the EIA report page 164. |
|  | <b>EMP</b>               |                                                                                                                                                                                    |                                                                                                                                                                                                                                        |
|  | 33                       | 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 as Chapter X in the EIA report page 157-164.                                                                                                                                     |
|  | 34                       | The Environmental Impact Assessment should hold detailed study on EMP with budget for green belt development and mine closure plan including disaster management plan.             | Environment Management plan with budget has been furnished in Tables 10.1 & 10.2 under Chapter X in the EIA report page 158-164.                                                                                                       |
|  | <b>Risk Assessment</b>   |                                                                                                                                                                                    |                                                                                                                                                                                                                                        |

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|  | 35                              | 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 prepared and provided in Section 7.2 under Chapter VII in the EIA report page 133-136. |
|  | <b>Disaster Management Plan</b> |                                                                                                                                                                                                                                                                                                                                                                                         |                                                                                                                                                          |
|  | 36                              | 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 prepared and provided in Section 7.3 under Chapter VII in the EIA report page 136,137.            |
|  | <b>Others</b>                   |                                                                                                                                                                                                                                                                                                                                                                                         |                                                                                                                                                          |
|  | 37                              | 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 is included as Annexure pages--330,331.                                                                                              |
|  | 38                              | 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 will be submitted in final EIA report.                                                                |

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|  | 39 | 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. | The plastic waste management has been discussed in Section 7.5 of Chapter VII in the EIA report page 152. |
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#### **Standard Terms of Reference for (Mining of minerals)**

##### **1.**

| <b>S.No</b> | <b>Terms of Reference</b>                                                                                                                                                                                                                                                                                                              | <b>Remarks</b>                                                                                                                                                             |
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| 1.1         | 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 a fresh quarry lease.                                                                                                                                 |
| 1.2         | A copy of the document in support of the fact that the Proponent is the rightful lessee of the mine should be given.                                                                                                                                                                                                                   | The proposed site for quarrying is a private land. A copy of the document showing that the proponent is the rightful lessee has been enclosed as Annexure, pages- 270-303. |
| 1.3         | All documents including approved mine plan, EIA and Public Hearing should be compatible with one another in terms of the mine lease area, production levels, waste generation and its management, mining technology etc. and should be in the name of the lessee.                                                                      | All documents are in the name of lessee.                                                                                                                                   |

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| 1.4 | All corner coordinates of the mine lease area, superimposed on a High-Resolution Imagery/ toposheet, topographic sheet, geomorphology and geology of the area should be provided. Such an Imagery of the proposed area should clearly show the land use and other ecological features of the study area (core and buffer zone).                                                                          | All corner coordinates of the mine lease area have been superimposed on a high-resolution Google Earth Image, is shown in Figure 2.2 of Chapter II, page-10.                                     |
| 1.5 | 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, is shown in Chapter III of EIA report, pages-40,44.                                  |
| 1.6 | Details about the land proposed for mining activities should be given with information as to whether mining conforms to the land use policy of the State; land diversion for mining should have approval from State land use board or the concerned authority.                                                                                                                                           | The lease area was inspected by the officers of Department of Mining and Geology along with revenue officials and found that the land is fit for quarrying under the policy of State Government. |
| 1.7 | 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 | The proponent has framed Environmental Policy and the same has been furnished in Section 10.1 under Chapter X, pp.157.                                                                           |

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|      | order of the Company to deal with the environmental issues and for ensuring compliance with the EC conditions may also be given. The system of reporting of non-compliances / violations of environmental norms to the Board of Directors of the Company and/or shareholders or stakeholders at large, may also be detailed in the EIA Report. |                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| 1.8  | Issues relating to Mine Safety, including subsidence study in case of underground mining and slope study in case of open cast mining, blasting study etc. should be detailed. The proposed safeguard measures in each case should also be provided.                                                                                            | It is an opencast quarrying operation proposed to operate in 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 45 <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. |
| 1.9  | 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 10 km radius for air, soil, water, and noise level sample collections, ecology and biodiversity studies. All data contained in the EIA report is for life of the mine / Lease period.                                                                                                                                                                                                                                          |
| 1.10 | Land use of the study area delineating forest area, agricultural land, grazing land, wildlife sanctuary, national park, migratory routes of fauna, water bodies, human                                                                                                                                                                         | Land use of the study area delineating the features has been discussed in Section 3.1.2 under Chapter III, pp.27-29.                                                                                                                                                                                                                                                                                                                                                          |

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|      | 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.                                                                                                                                                                                                                                                                                                                                                                      | The details of surrounding sensitive ecological features have been provided in Table 3.36 under Chapter III, p.102.<br>Land use plan of the project area showing pre- operational, operational and post-operational phases are discussed in Table 2.9 under Chapter II, p.19. |
| 1.11 | Details of the land for any Over Burden Dumps outside the mine lease, such as extent of land area, distance from mine lease, its land use, R&R issues, if any, should be given                                                                                                                                                                                                                                                                                                                                                                                                                                                         | Not Applicable, the rough stone excavation is of 100% recovery, no dump or overburden will remain in or around the lease area.                                                                                                                                                |
| 1.12 | A Certificate from the Competent Authority in the State Forest Department should be provided, confirming the involvement of forest land, if any, in the project area. In the event of any contrary claim by the Project Proponent regarding the status of forests, the site may be inspected by the State Forest Department along with the Regional Office of the Ministry to ascertain the status of forests, based on which, the Certificate in this regard as mentioned above be issued. In all such cases, it would be desirable for representative of the State Forest Department to assist the State Expert Appraisal Committees | Not applicable, as No forest land involved. The details have been given in Table 3.36 under Chapter III, p.102.                                                                                                                                                               |
| 1.13 | 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                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | Not applicable, as the proposed project area does not involve any forest land.                                                                                                                                                                                                |



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|      | afforestation (CA) should be indicated. A copy of the forestry clearance should also be furnished                                                                                                                                                                                                                                                                                      |                                                                                                                                                                                                                                                                                                        |
| 1.14 | 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.<br>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).                                          |
| 1.15 | The vegetation in the RF / PF areas in the study area, with necessary details, should be given.                                                                                                                                                                                                                                                                                        | No Reserve Forest is found nearby the study area. The details of reserve forest within 10km have been tabulated in Table 3.36 under Chapter III, p.102.                                                                                                                                                |
| 1.16 | 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 around the periphery of the project area.<br>Information regarding wildlife /protected area within 10km has been given in Table 3.36 under Chapter III, p.102.<br>Impact on Fauna and mitigation measures are given in section 4.6.3 under chapter III, p.122. |
| 1.17 | 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 | The details of National Parks, Biosphere Reserves, Wildlife Corridors, and Tiger/Elephant Reserves within 10 km radius from the periphery of the project area furnished in Table 3.36 of Chapter III, p.102.                                                                                           |

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|      | ecologically sensitive areas as mentioned above, should be obtained from the Standing Committee of National Board of Wildlife and copy furnished.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                                                                                                                                        |
| 1.18 | 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. | A detailed biological study was carried out in both core and buffer zones and the results have been discussed in Section 3.5 of Chapter III, pp.70-85. |
| 1.19 | 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 Dept. Should be secured and furnished to the effect that the proposed mining activities could be considered                                                                                                                                                                                                                                                                                                        | Not Applicable.<br>Project area / Study area is not included in 'Critically Polluted' Area and does not come under 'Aravalli Range'.                   |

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| 1.20 | 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<br><br>The project doesn't attract the C.R.Z. Notification, 2018.                                                                             |
| 1.21 | R&R Plan/compensation details for the Project Affected People (PAP) should be furnished. While preparing the R&R Plan, the relevant State/National Rehabilitation & Resettlement Policy should be kept in view. In respect of SCs /STs and other weaker sections of the society in the study area, a need-based sample survey, family-wise, should be undertaken to assess their requirements, and action programmes prepared and submitted accordingly, integrating the sectoral programmes of line departments of the State Government. It may be clearly brought out whether the village(s) located in the mine lease area will be shifted or not. The issues relating to shifting of village(s) including their R&R and socio-economic aspects should be discussed in the Report | Not Applicable.<br><br>There are no approved habitations of SCs/STs and any other weaker sections in the lease area.<br><br>Therefore, no R&R Plan required. |
| 1.22 | One season (non-monsoon) [i.e. March-May (Summer Season); October-December (post monsoon season); December-                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | Baseline data were collected for the period of October 2025 - December 2025 as per                                                                           |

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|      | <p>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</p> | <p>CPCB notification and MoEF &amp; CC Guidelines.</p> <p>Primary baseline data and the results have been discussed in Sections 3.1-3.9 of Chapter III, pp. 25-103.</p>                                        |
| 1.23 | <p>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</p>                                                                                                                                                                                                                                                                  | <p>Air quality modelling for prediction of incremental GLCs of pollutants was carried out using AERMOD view 11.2.0. The model results have been discussed in Section 4.4 under the Chapter IV, pp.110-115.</p> |

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|      | wind roses showing pre-dominant wind direction may also be indicated on the map                                                                                                                        |                                                                                                                                                                                                                                                                                                                                                                  |
| 1.24 | 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.21.                                                                                                                                                                                                                                      |
| 1.25 | Necessary clearance from the Competent Authority for drawl of requisite quantity of water for the Project should be provided                                                                           | Not Applicable.<br>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.<br>Drinking water will be bought from the approved local water vendors.                                   |
| 1.26 | Description of water conservation measures proposed to be adopted in the Project should be given. Details of rainwater harvesting proposed in the Project, if any, should be provided                  | Part of the working pit will be allowed to collect rain water during the spell of rain. The water thus collected will be used for greenbelt development and dust suppression.<br>The mine closure plan has been prepared for converting the excavated pit into rain water harvesting structure and serve as water reservoir for nearby villages during droughts. |
| 1.27 | 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                                                                                                                                                                                                                                                   |

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|      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | discussed in Section 4.3 under Chapter IV, pp. 107-109.                                                                                                                                                                                                                                                                                          |
| 1.28 | 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 State Ground Water Authority for working below ground water and for pumping of ground water should also be obtained and copy furnished | <p>Not Applicable.</p> <p>The ground water table is found at the depth of 65-60 m below ground level. The ultimate depth of quarry is 45m BGL. Therefore, the mining activity will not intersect the ground water table. Data regarding the occurrence of groundwater table have been provided in Section 3.2.2 under Chapter III, pp.46-55.</p> |
| 1.29 | 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                                                                                                                                                                                                                                                                                                                                                                                                    | <p>Not Applicable.</p> <p>There are no streams, seasonal or other water bodies passing within the project area.</p> <p>Therefore, no modification or diversion of water bodies is anticipated.</p>                                                                                                                                               |
| 1.30 | 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.                                                                                                                                                                                                                                                                                                                                                                                                                             | <p>The highest elevation of the project area is 94m.</p> <p>Ultimate depth of the mine is 45m BGL.</p> <p>Depth to the water level in the area is 65-60m BGL.</p> <p>Schematic diagram is included in chapter III, page-55.</p>                                                                                                                  |

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| 1.31 | <p>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.</p> | <p>Greenbelt development plan has given in Section 4.6 under Chapter IV, pp.121.</p>                                                                                                                                                                                                                                 |
| 1.32 | <p>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</p>                                                                                                                                                                                                                                      | <p>Traffic density survey was carried out to analyze 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 are provided in Section 3.7 under Chapter III, p.99-101.</p> |

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|      | Transportation study as per Indian Road Congress Guidelines.                                                                                                                                                                                                                                                                                                                               |                                                                                                                                                                                                                                                                                                                                                       |
| 1.33 | Details of the onsite shelter and facilities to be provided to the mine workers should be included in the EIA Report.                                                                                                                                                                                                                                                                      | Infrastructure & other facilities which are to be provided for mine workers has been discussed in Section 2.5.6 of Chapter II, page.21.                                                                                                                                                                                                               |
| 1.34 | 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 4.10 under Chapter IV, page 125,126.                                                                                                                                                                                                                         |
| 1.35 | 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 Section 4.8 of Chapter IV, pp.123-125.                                                                                                                                                                                                                      |
| 1.36 | 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.                                                                                                                                                          | <p>No public health implications are anticipated due to this project. The workers will be provided with face masks, helmets, rain coats, first aid kits etc.</p> <p>Regular health check-up will be conducted and medications will be provided, if needed.</p> <p>CSR &amp; CER details are given in section 8.6, 8.7-chapter VIII, page-154,155.</p> |



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| 1.37 | 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 22 people directly as discussed in Section 8.1, 8.2 under Chapter VIII, p.153. |
| 1.38 | 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 prepared and provided in Tables 10.1 & 10.2 of Chapter X, page-158-164.                                                                                                                                        |
| 1.39 | 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 minutes of public hearing will be included in final EIA report.                                                                                                                                                                                       |
| 1.40 | 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.                                                                                                                                                                                               |
| 1.41 | 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.72,28,000/-<br>CER Cost is Rs. 5,00,000/-<br>In order to implement the environmental protection measures, an amount of Rs. 56,46,340 as capital cost and recurring cost as Rs. 20,92,757 as recurring                                  |

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|      |                                                                                                                                                                                                                                                 | 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. 1,72,10,141, as shown in Tables 10.1 & 10.2 under Chapter X, pp.158-164. |
| 1.42 | A Disaster management Plan shall be prepared and included in the EIA/EMP Report                                                                                                                                                                 | The disaster management plan for this project has been prepared and provided in Section 7.3 of Chapter VII, page136,137.                                                                                                                                                                   |
| 1.43 | 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 in all aspects is given as Chapter VIII in EIA report page-153-155.                                                                                                                                                                                                |
| 1.44 | Besides the above, the below mentioned general points are also to be followed                                                                                                                                                                   |                                                                                                                                                                                                                                                                                            |
| a)   | All documents to be properly referenced with index and continuous page numbering                                                                                                                                                                | All the documents are properly referenced with index and continuous page numbering.                                                                                                                                                                                                        |
| b)   | 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.                                                                                                                                                                                                                       |
| c)   | 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. | All the original Baseline sample analysis/testing reports will be included in final EIA report.                                                                                                                                                                                            |

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| d) | Where the documents provided are in a language other than English, an English translation should be provided.                                                                                                                                                                                                                                                                                                                                                                          | All the documents provided are in English language only.                                                                                                    |
| e) | The Questionnaire for environmental appraisal of mining projects as devised earlier by the Ministry shall also be filled and submitted.                                                                                                                                                                                                                                                                                                                                                | The questionnaire will be included in final EIA report.                                                                                                     |
| f) | While preparing the EIA report, the instructions for the Proponents and instructions for the Consultants issued by MoEF vide O.M. No. J-11013/41/2006-IA.II(I) dated 4th August, 2009, which are available on the website of this Ministry, should be followed.                                                                                                                                                                                                                        | Instructions issued by MoEF & CC O.M. No. J-11013/41/2006-IA. II (I) dated 4 <sup>th</sup> August, 2009 have been followed while preparing this EIA report. |
| g) | 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.                                                                                          |
| h) | 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,                                                                                                                                                                                                                                                                  | It is a new lease area; this condition is not applicable.                                                                                                   |

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|    | should be obtained from the Regional Office of Ministry of Environment, Forest and Climate Change, as may be applicable.                                                                                                                                                                                                                                                       |                                                                                                                                   |
| i) | <p>The EIA report should also include;</p> <ul style="list-style-type: none"> <li>(i) surface plan of the area indicating contours of main topographic features, drainage and mining area,</li> <li>(ii) geological maps and sections,</li> <li>(iii) sections of the mine pit and external dumps, if any, clearly showing the land features of the adjoining area.</li> </ul> | All the plans including surface & geological plans, and progressive closure plan have been included as Annexures, pages-.319-328. |

#### **A. Standard Terms of Reference**

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| 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, it is fresh quarry lease.                                                                                                                                                                                  |
| 2. | A copy of the document in support of the fact that the proponent is the rightful lessee of the mine should be given.                                                                                                                                                                                                                   | <p>The proposed site for quarrying is a private land.</p> <p>A copy of the document showing that the proponent is the rightful lessee has been enclosed along with the approved mining plan in Annexure pages-270-303.</p> |
| 3. | All documents including approved mine plan, EIA and Public Hearing should be                                                                                                                                                                                                                                                           | All documents are in the name of lessee.                                                                                                                                                                                   |

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|    | 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/ toposheet, topographic sheet, geomorphology and geology of the area should be provided. Such an Imagery of the proposed area should clearly show the land use and other ecological features of the study area (core and buffer zone). | All corner coordinates of the mine lease area have been superimposed on a high-resolution Google Earth Image, is shown in Figure 2.2 of Chapter II in the EIA report page 10.                    |
| 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, are shown in Chapter III in the EIA report page 40,44.                               |
| 6. | Details about the land proposed for mining activities should be given with information as to whether mining conforms to the land use policy of the State; land diversion for mining should have approval from State land use board or the concerned authority.                                                                  | The lease area was inspected by the officers of Department of Geology and Mining 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.                                                                                                                     | The Environmental Policy is discussed in the Section 10.1 of Chapter X in the EIA report page 157.                                                                                               |

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|    | <p>prescribed operating process/ procedures to bring into focus any infringement/ deviation/ violation of the environmental or forest norms/conditions? The hierarchical system or administrative order of the Company to deal with the environmental issues and for ensuring compliance with the EC conditions may also be given. The system of reporting of non-compliances / violations of environmental norms to the Board of Directors of the Company and/or shareholders or stakeholders at large, may also be detailed in the EIA Report</p> |                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| 8. | <p>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</p>                                                                                                                                                                                                                                                                                           | <p>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 45° bench angles. Quarrying activities will be carried out under the supervision of Competent Persons like Mines Manager, Mines Foreman and Mining Mate. Necessary permissions will be obtained from DGMS after obtaining Environmental Clearance.</p> |
| 9. | <p>The study area will comprise of 10 km zone around the mine lease from lease periphery and the data contained in the EIA such as waste generation etc., should be for the life of the mine / lease period.</p>                                                                                                                                                                                                                                                                                                                                    | <p>The study area considered for this study is of 10km radius for air, soil, water, and noise level sample collections, ecology and biodiversity studies and all data contained in the EIA report such as waste</p>                                                                                                                                                                                                                                                      |

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|     |                                                                                                                                                                                                                                                                                                                                                                                                                                                 | 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.        | <p>Land use of the study area delineating features has been discussed in Section 3.1.2 under Chapter III in the EIA report page 27-29</p> <p>The details of surrounding sensitive ecological features have been provided in Table 3.36 under Chapter III in the EIA report page 102</p> <p>Land use plan of the project area showing pre- operational, operational and post-operational phases are tabulated in Table 2.9 under Chapter II in the EIA report page 19.</p> |
| 11. | Details of the land for any over burden dumps outside the mine lease, such as extent of land area, distance from mine lease, its land use, R&R issues, if any, should be given.                                                                                                                                                                                                                                                                 | It is not applicable, rough stone is of 100% recovery and no dumps have been proposed outside the lease area. The entire quarried out rough stone will be transported to the needy customers. No raise of R&R                                                                                                                                                                                                                                                             |
| 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 | <p>It is not applicable as there is no forest land involved within the proposed project area.</p> <p>The details of RF nearby the lease area is given in Table 3.36 under Chapter III in the EIA report page 102.</p>                                                                                                                                                                                                                                                     |

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|     | <p>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.</p>                                                                                                                                                       |                                                                                                                                                                                                                      |
| 13. | <p>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.</p>                                                                 | <p>It is not applicable, as the proposed project area does not involve any forest land.</p>                                                                                                                          |
| 14. | <p>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.</p>                                                                                                                                                  | <p>Not Applicable.</p> <p>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.</p>             |
| 15. | <p>The vegetation in the RF / PF areas in the study area, with necessary details, should be given.</p>                                                                                                                                                                                                                                       | <p>There is no any reserve forest in the study area.</p> <p>The details of reserve forest nearby are listed in the Table 3.36 under Chapter III in the EIA report page 102.</p>                                      |
| 16. | <p>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.</p> | <p>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 3.36 under Chapter III in the EIA report page 102.</p> |



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| 17. | <p>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.</p>                                                                                                                                                                                            | <p>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 3.36 under Chapter III in the EIA report page 102.</p> |
| 18. | <p>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.</p> | <p>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 in the EIA report page 70-85.</p>                                                                                            |

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| 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.<br><br>Project area / Study area is not listed 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.<br><br>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. 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 | Not Applicable.<br><br>There are no approved habitations of SCs/STs and other weaker sections in the lease area.<br><br>Therefore, R&R Plan / Compensation Plan is not required. |

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|     | <p>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 aspect should be discussed in the Report</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                                                                                                                                                                                                                                                                                      |
| 22  | <p>One season (non-monsoon) [i.e., March-May (Summer Season); October-December (post monsoon season); December-February (winter season)] primary baseline data on ambient air quality as per CPCB Notification of 2009, water quality, noise level, soil and flora and fauna shall be collected and the AAQ and other data so compiled presented date-wise in the EIA and EMP Report. Site-specific meteorological data should also be collected. The location of the monitoring stations should be such as to represent whole of the study area and justified keeping in view the pre-dominant downwind direction and location of sensitive receptors. There should be at least one monitoring station within 500 m of the mine lease in the pre-dominant downwind direction. The mineralogical composition of PM10, particularly for free silica, should be given.</p> | <p>Baseline data were collected for the period of October - December 2025 as per CPCB notification and MoEF &amp; CC Guidelines.</p> <p>Primary baseline data and the results have been included and discussed in Sections 3.1-3.9 of Chapter III in the EIA report page 25-103.</p> |
| 23. | <p>Air quality modelling should be carried out for prediction of impact of the project on the air quality of the area. It should also take into</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | <p>Air quality modelling for prediction of incremental GLCs of pollutants was carried out using AERMOD view 11.2.0.</p>                                                                                                                                                              |

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|     | 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 | The model results have been given in Section 4.4 under the Chapter IV in the EIA report page 110-115.                                                                                                                                                                                                                       |
| 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 in the EIA report page 21.                                                                                                                                                                             |
| 25. | Necessary clearance from the competent Authority for drawl of requisite quantity of water for the project should be provided.                                                                                                                                                                                                                                                                                             | Not Applicable.<br>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 local water vendors. |
| 26. | Description of water conservation measures proposed to be adopted in the Project should be given. Details of rainwater harvesting proposed in the Project, if any, should be provided.                                                                                                                                                                                                                                    | Part of the working pit will be allowed to collect rain water during the spell of rain. The water thus collected will be used for greenbelt development and dust suppression. The mine closure plan has been prepared for converting the excavated pit into rain water harvesting                                           |

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|     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | structure and serve as water reservoir for nearby villages during droughts.                                                                                                                                                                                                                                                                               |
| 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 of Chapter IV in the EIA report page 107-109.                                                                                                                                                                     |
| 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. | <p>The ground water table is found at the depth of 60-65m below ground level.</p> <p>The ultimate depth of quarry is 45m BGL. Therefore, the mining activity will not intersect the ground water table.</p> <p>Data regarding the occurrence of groundwater table have been provided in Section 3.2.2 under Chapter III in the EIA report page 46-55.</p> |
| 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                                                                                                                                                                                                                                                                                                                                                                                                       | <p>Not Applicable.</p> <p>There are no streams, seasonal or other water bodies passing within the project area.</p> <p>Therefore, no modification or diversion of water bodies is anticipated.</p>                                                                                                                                                        |
| 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 94m.                                                                                                                                                                                                                                                                                                         |

|     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                                                                                                                                                                                                                                                      |
|-----|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|     | <p>schematic diagram may also be provided for the same.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | <p>Ultimate depth of the mine is 45m BGL. Depth to the water level in the area is 60-65m below the ground level.</p> <p>Schematic diagram is included in chapter III, page -55.</p>                                                                  |
| 31. | <p>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.</p> | <p>Greenbelt development plan has been prepared and given in Section 4.6.2 under Chapter IV in the EIA report page 120, 121.</p>                                                                                                                     |
| 32. | <p>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</p>                                                                                                                                                                                                                                                                                                                                                                                                              | <p>Traffic density survey was carried out to analyses 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.</p> |

|     |                                                                                                                                                                                                                                                                                                                                                                                            |                                                                                                                                                                                             |
|-----|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|     | 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.                                                                                                                                                        | Details have been provided in Section 3.7 under Chapter III in the EIA report page 99-101.                                                                                                  |
| 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 which are to be provided for mine workers after the grant of quarry lease has been discussed in Section 2.5.6 under Chapter II in the EIA report page 21. |
| 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 4.10 under Chapter II in the EIA report page 125,126.                                              |
| 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 Section 4.8 under Chapter IV in the EIA report page 123-125.                                      |
| 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                                                                                                                                                                                                                        | No public health implications are anticipated due to this project.                                                                                                                          |

|     |                                                                                                                                                                                                                                                                                           |                                                                                                                                                                                                                                                                                                                                                 |
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|     | measures should be detailed along with budgetary allocations.                                                                                                                                                                                                                             | <p>The workers will be provided with face masks, helmets, rain coats, first aid kits etc.</p> <p>Regular health check-up will be done for workers and medical camps were conducted for local people and medications will be provided, if needed.</p> <p>The CSR &amp; CER details are given in section 8.6, 8.7-chapter VIII, page-154,155.</p> |
| 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 22 people directly as discussed in Section 8.1-8.7 under Chapter VIII 153-155.                                                                                       |
| 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 Table 10.1 & 10.2 under Chapter X in the EIA report page 157-164.                                                                                                                                                                                                      |
| 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                                                                                            | The minutes of public hearing and the responses of proponent will be included in final EIA report.                                                                                                                                                                                                                                              |



|     |                                                                                                                                                                                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
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|     | 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                                           | 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. 72,28,000/-<br>CER Cost is Rs. 5,00,000/-<br>In order to implement the environmental protection measures, an amount of Rs. 56,46,340 as capital cost and recurring cost as Rs. 20,92,757 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 05 years will be Rs. 1,72,10,141 and shown in Tables 10.1 & 10.2 of Chapter X, pp 157-164. |
| 42. | A disaster management plan shall be prepared and included in the EIA/EMP Report.                                                                                                          | The disaster management plan for this project has been provided in Section 7.3 under Chapter VII in the EIA report page 136-137.                                                                                                                                                                                                                                                                                                                                                                                   |
| 43. | Benefits of the Project if the Project is implemented should be spelt out. The benefits of the Project shall clearly indicate environmental, social, economic, employment potential, etc. | Benefits of the project details have been given as Chapter VIII in the EIA report page 153-155.                                                                                                                                                                                                                                                                                                                                                                                                                    |
| 44  | Besides the above, the below mentioned general points are also to be followed:                                                                                                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |

|    |                                                                                                                                                                                                                                                                       |                                                                                                                                                             |
|----|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------|
| a) | Executive Summary of the EIA/EMP Report.                                                                                                                                                                                                                              | Executive summary has been enclosed as a separate booklet.                                                                                                  |
| b) | All documents to be properly referenced with index and continuous page numbering.                                                                                                                                                                                     | All the documents have been properly referenced with index and continuous page numbering.                                                                   |
| c) | Where data are presented in the Report especially in Tables, the period in which the data were collected and the sources should be indicated.                                                                                                                         | List of tables and source of the data collected have been mentioned.                                                                                        |
| d) | Project Proponent shall enclose all the analysis/testing reports of water, air, soil, noise etc. using the MoEF & CC/NABL accredited laboratories. All the original analysis/testing reports should be available during appraisal of the Project.                     | All original Baseline sample analysis/testing reports will be submitted 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 submitted in the final EIA report.                                                                                                |
| g) | While preparing the EIA report, the instructions for the Proponents and instructions for the Consultants issued by MoEF & CC vide O.M. No. J-11013/41/2006-IA. II(I) dated 4th August, 2009, which are available on the website of this Ministry, should be followed. | Instructions issued by MoEF & CC O.M. No. J-11013/41/2006-IA. II (I) dated 4 <sup>th</sup> August, 2009 have been followed while preparing this EIA report. |
| h) | Changes, if any made in the basic scope and project parameters (as submitted in Form- I                                                                                                                                                                               | No changes are made in the basic scope and the project parameters.                                                                                          |

|    |                                                                                                                                                                                                                                                                                                                                                                                                  |                                                                                                                                   |
|----|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------|
|    | and the PFR for securing the TOR) should be brought to the attention of MoEF & CC with reasons for such changes and permission should be sought, as the TOR may also have to be altered. Post Public Hearing changes in structure and content of the draft EIA/EMP (other than modifications arising out of the P.H. process) will entail conducting the PH again with the revised documentation |                                                                                                                                   |
| i) | As per the circular no. J-11011/618/2010-IA. II(I) Dated: 30.5.2012, certified report of the status of compliance of the conditions stipulated in the environment clearance for the existing operations of the project, should be obtained from the Regional Office of Ministry of Environment, Forest and Climate Change, as may be applicable.                                                 | As it is a new lease area, this condition is not applicable.                                                                      |
| j) | The EIA report should also include;<br>(i) surface plan of the area indicating contours of main topographic features, drainage and mining area,<br>(ii) geological maps and sections and,<br>(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 as Annexures, pages- 319-329. |

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## **CHAPTER I**

### **INTRODUCTION**

#### **1.0 PREAMBLE**

Environmental Impact Assessment (EIA) study is a process used to identify the environmental, social and economic impacts of a project prior to decision-making. EIA systematically examines both beneficial and adverse consequences of the proposed project and ensure that these impacts are considered during the project designing. According to the Ministry of Environment and Forests, Govt. of India, EIA notification S.O. 1533(E) of 14<sup>th</sup> September 2006 and its subsequent amendments the projects are categorized into A, B1 & B2 to determine the level of scrutiny and process. The mining projects whose extent is  $\geq 5$  ha or the cluster of quarries (if homogeneous mineral) within 500m radius extent is greater than 5ha falls under category B1. These projects require preparation and submission of an EIA report after public consultation to SEIAA to obtain environmental clearance as per the Office Memorandum F.No. L-11011/175/2018-IA-II (M) Dated: 12.12.2018.

#### **1.1 PURPOSE OF THE REPORT**

The purpose of the report is to evaluate the project's potential environmental, social and economic effects of the before it is implemented adhering to the guidelines outlined in the MoEF & CC Notification, S.O. 996 (E) dated 10.04.2015 and MoEF & CC Office Memorandum dated 29.08.2017.

#### **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***

The project had applied in PARIVESH 2.0 proposal no. proposal no. SIA/TN/MIN/545425/2025, Dated: 19.07.2025 to obtain terms of reference.

##### ***Scoping***

The mechanism for issuing online system generated Standard ToR as well as reference to SEAC has been enabled on the PARIVESH Portal on the acceptance of the complete application online. The concerned Member Secretary of SEAC shall refer the project to the concerned SEAC for prescribing additional ToR as per the circular F.No. IA 3-22/15/2022-IA-III [Computer No 178038] Dated: 6<sup>th</sup> May 2022.



### ***Public Consultation***

In this stage, an application along with the draft EIA and EMP report will be made to the Member Secretary of the Tamil Nadu Pollution Control Board (TNPCB) and request to conduct Public Hearing as per EIA notification 2006. The outcome of the public hearing Details given in Final EIA Report.

### ***Appraisal***

In this stage, the final EIA report will submit in PARIVESH 2.0 to SEIAA, TN. Based on the recommendations of SEAC the SEIAA, TN will grant EC or castoff.

### **1.3 TERMS OF REFERENCE (ToR)**

The total extent of quarries within the 500m radius is greater than 5 ha. The details of the quarries within the cluster are given in Table 1.1.

**Table 1.1 Details of quarries within the cluster of 500m radius**  
**Proposed Quarries**

| Proposed Quarries |                             |                                                                                                                   |                   |             |                          |
|-------------------|-----------------------------|-------------------------------------------------------------------------------------------------------------------|-------------------|-------------|--------------------------|
| Cod e             | Name of the Owner           | S.F. No                                                                                                           | Village           | Extent (ha) | Status                   |
| P1                | Sri Kanniyammal Blue Metals | 162/1, 162/2A, 162/2B, 162/3, 162/4, 162/5A, 162/5B, 162/6, 162/7, 162/8, 162/10A1, 162/10A2,162/10A3A, 162/10A3B | Kundiyathandalam  | 3.38.58     | Proposed Area            |
|                   |                             | 117/12A2, 144/1A, 144/2                                                                                           | Poonaitangal      |             |                          |
| Existing Quarry   |                             |                                                                                                                   |                   |             |                          |
| E1                | K.Chandrasekaran            | 163/1A,1B,2,3,4, 7,8A,9,10A,10B, 11                                                                               | Kundiyanthandalam | 1.97.5      | 02.12.2021 to 01.12.2031 |
| E2                | Sri Thirumala Blue Metals   | 47/1A,1B,1C2 & etc                                                                                                | Menallur          | 2.98.5      | 07.05.2021 to 06.05.2031 |

|                             |                                      |                                                                                                            |                                        |                 |                                |
|-----------------------------|--------------------------------------|------------------------------------------------------------------------------------------------------------|----------------------------------------|-----------------|--------------------------------|
| E3                          | Willian                              | 159,160,164/2<br>(P)                                                                                       | Kundiyanthandalam                      | 2.88.0          | 24.12.2021<br>To<br>23.12.2026 |
| E4                          | Bhuvaneshwari                        | 181/1I1,1I2,1J1,<br>1J2,1L1,1L2,1M<br>1,1M2,1N1,1N2<br>,1O1,1O2,1O3,1<br>O4,1P,1Q1,1Q2,<br>1Q3             | Kundiyanthandalam                      | 2.05.5          | 23.02.2022<br>To<br>22.02.2032 |
| E5                          | Dasaradhan                           | 186/1,190/2B1,2<br>B2                                                                                      | Kundiyanthandalam                      | 2.88.5          | 15.07.2022<br>To<br>14.02.2032 |
| E6                          | K.Moorthy                            | 162/9,10B,163/5<br>,6,10C,12,13A,1<br>3B,13C,13D,13<br>E,13F,14A,181/<br>1D1,1D2,1E1,1<br>E2,<br>117/14,15 | Kundiyanthandalam<br>&<br>Poonathangal | 3.68.0          | 08.02.2023<br>To<br>07.02.2033 |
| E7                          | Lakshmi<br>Narayana                  | 152/6,4B,5B,15<br>1/3,121/2 etc                                                                            | Menallur<br>&<br>Poonathangal          | 7.21.4          | 15.05.2023<br>To<br>14.02.2033 |
| E8                          | Sri Thirumala<br>Blue Metals II      | 146/39B,146/46                                                                                             | Menallur                               | 4.44.35         | 17.02.2025<br>To<br>16.02.2030 |
| E9                          | Aditya Dura<br>Aggregates Pvt<br>Ltd | 124/30,124/31                                                                                              | Poonathangal                           | 4.87.88         | 12.02.2025                     |
| <b>Total Cluster Extent</b> |                                      |                                                                                                            |                                        | <b>36.38.21</b> |                                |

Source: DD Letter - Rc.No. 172/Kanimam/2025 dated: 29.08.2025.

The file was appraised in 609<sup>th</sup> SEAC meeting on 26.08.2025 and issued terms of reference (ToR) identification no **TO25B0108TN5856513N** on **25.09.2025** by SEIAA, TN.

## 1.4 POST ENVIRONMENT CLEARANCE MONITORING

- The project proponent shall prominently advertise in the newspapers indicating that the project has been accorded environmental clearance and the details of the website where it is displayed.
- The project proponent will submit a half-yearly compliance report of the stipulated environmental conditions to Regional Office, MoEF & CC & SEIAA on 1<sup>st</sup> June and 1<sup>st</sup> December of every year.

## 1.5 TRANSFERABILITY OF ENVIRONMENTAL CLEARANCE

The prior environmental clearance granted for a project or activity may be transferred as per the provisions of para 11 of the Environmental Impact Assessment Notification, 2006 and its subsequent amendments and the office memorandum File No. IA3-22/19/2023-IA.III [E226246] Dated: 3<sup>rd</sup> November 2023.

## 1.6 IDENTIFICATION OF THE PROJECT PROPONENT

The details of the project proponent are given in Table 1.2 below.

**1.2 Details of Project Proponent**

| Name of the Project Proponent | M/s.Sri Kanniammal Blue Metals                                                                                                             |
|-------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------|
| Address                       | Proprietor, Mr.K.Kumar,<br>S/o.Kannaiyan,<br>S.No.660/2A,2B,2D,660/1A,1B,<br>Aarpakkam Village, Walajabad Taluk,<br>Kancheepuram District. |
| Status                        | Proponent                                                                                                                                  |

## 1.7 BRIEF DESCRIPTION OF THE PROJECT

The method adopted for rough stone excavation is open cast semi mechanized method involving formation of benches with 5m height and 5m width and the overall bench slope is less than 65°. The quarry operation involves shallow jackhammer drilling, slurry blasting, excavation, loading and transportation.

The overall extent of the project site is 3.38.58ha and it is located in Kundiyathandalam & Poonathangal Village, Vembakkam Taluk, Tiruvannamalai District, Tamil Nadu.

The proposed project deals with excavation of rough stone and gravel which is primarily used in construction projects. The increasing demand for rough stone fueled by a booming construction industry presents a valuable opportunity. This project will not only meet the rising demand for rough stone but also create jobs for the surrounding villages.

## **1.8 SCOPE OF THE STUDY**

The main scope of the EIA study is to quantify the cumulative impact of the quarries in the cluster and formulate the effective mitigation measures. The baseline monitoring study has been carried out during the period of **Oct to Dec 2025** for various environmental components such as land, soil, air, water, noise, ecology, etc. to assess the anticipated impacts of the cluster on the environment and suggest suitable mitigation measures for likely adverse impacts due to the proposed project.

## **1.9 Legislation Applicable to Mining of Mineral Sector**

A few important legislations are given below:

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

## CHAPTER II

### PROJECT DESCRIPTION

#### 2.0 DECSRIPTION OF THE PROJECT

The proponent M/s. Sri Kanniammal Blue Metals Projects is involved in the mining and its auxiliary activities. The proponent had applied for quarry lease on 05.03.2025 to extract rough stone and gravel. The precise area communication letter was issued by Deputy Director of Geology and Mining, Tiruvannamalai vide (Roc.No.172/Mines/2025, Dated 04.04.2025). The mining plan thus prepared was approved by Deputy Director Department of Geology and Mining, Tiruvannamalai (Rc.No.172/Kanimam/2025 Dated. 29.08.2025). The project area and the proposed excavation details were given in Table 2.1.

**Table 2.1 Proposed project area and excavation details**

|                                  |                                                                |                              |                          |                           |
|----------------------------------|----------------------------------------------------------------|------------------------------|--------------------------|---------------------------|
| Name of the Quarry               | M/s. Sri Kanniammal Blue Metals, Rough stone and gravel quarry |                              |                          |                           |
| Type of Land                     | Patta Land                                                     |                              |                          |                           |
| Extent                           | 3.38.58 Ha                                                     |                              |                          |                           |
| Toposheet No                     | 57-P/10                                                        |                              |                          |                           |
| Location of Project Site         | 12°43'59.10"N to 12°44'8.20"N<br>79°42'55.27"E to 79°43'2.53"E |                              |                          |                           |
| Highest Elevation                | 94m AMSL                                                       |                              |                          |                           |
| Proposed depth of Mining         | 45m BGL                                                        |                              |                          |                           |
| Geological Resources             | Rough Stone in m <sup>3</sup>                                  |                              | Gravel in m <sup>3</sup> |                           |
|                                  | m <sup>3</sup>                                                 | Tons (m <sup>3</sup> * 2.75) | m <sup>3</sup>           | Tons (m <sup>3</sup> * 2) |
|                                  | 1523250                                                        | 4188938                      | 169250                   | 338500                    |
| Mineable Reserves                | Rough Stone in m <sup>3</sup>                                  |                              | Gravel in m <sup>3</sup> |                           |
|                                  | m <sup>3</sup>                                                 | Tons (m <sup>3</sup> * 2.75) | m <sup>3</sup>           | Tons (m <sup>3</sup> * 2) |
|                                  | 296860                                                         | 816368                       | 82550                    | 165100                    |
| Proposed reserves for five years | Rough Stone in m <sup>3</sup>                                  |                              | Gravel in m <sup>3</sup> |                           |
|                                  | m <sup>3</sup>                                                 | Tons (m <sup>3</sup> * 2.75) | m <sup>3</sup>           | Tons (m <sup>3</sup> * 2) |
|                                  | 296860                                                         | 816368                       | 82550                    | 165100                    |
| Method of Mining                 | Open-Cast Mechanized mining                                    |                              |                          |                           |
| Topography                       | Flat Topography                                                |                              |                          |                           |
| Machinery proposed               | Jack Hammer                                                    |                              | 2                        |                           |
|                                  | Compressor                                                     |                              | 2                        |                           |
|                                  | Tipper                                                         |                              | 8                        |                           |

|                              |                                                                                                                                                                                                             |   |
|------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---|
|                              | Hydraulic Excavator                                                                                                                                                                                         | 2 |
| Blasting Method              | The quarrying operation is proposed to be carried out by open cast mining in conjunction with conventional method using jack hammer drilling and blasting for shattering effect and loosen the rough stone. |   |
| Proposed Manpower Deployment | 22 Nos                                                                                                                                                                                                      |   |
| Project Cost                 | Rs.72,28,000/-                                                                                                                                                                                              |   |
| CER Cost                     | Rs. 5,00,000/-                                                                                                                                                                                              |   |
| Proposed Water Requirement   | 3.5 KLD                                                                                                                                                                                                     |   |

## 2.1 LOCATION AND ACCESSIBILITY

The proposed quarry project is located in Kundiyaithandalam and Poonathangal villages, Vembakkam Taluk, Tiruvannamalai District, Tamil Nadu as shown in Figure 2.1.

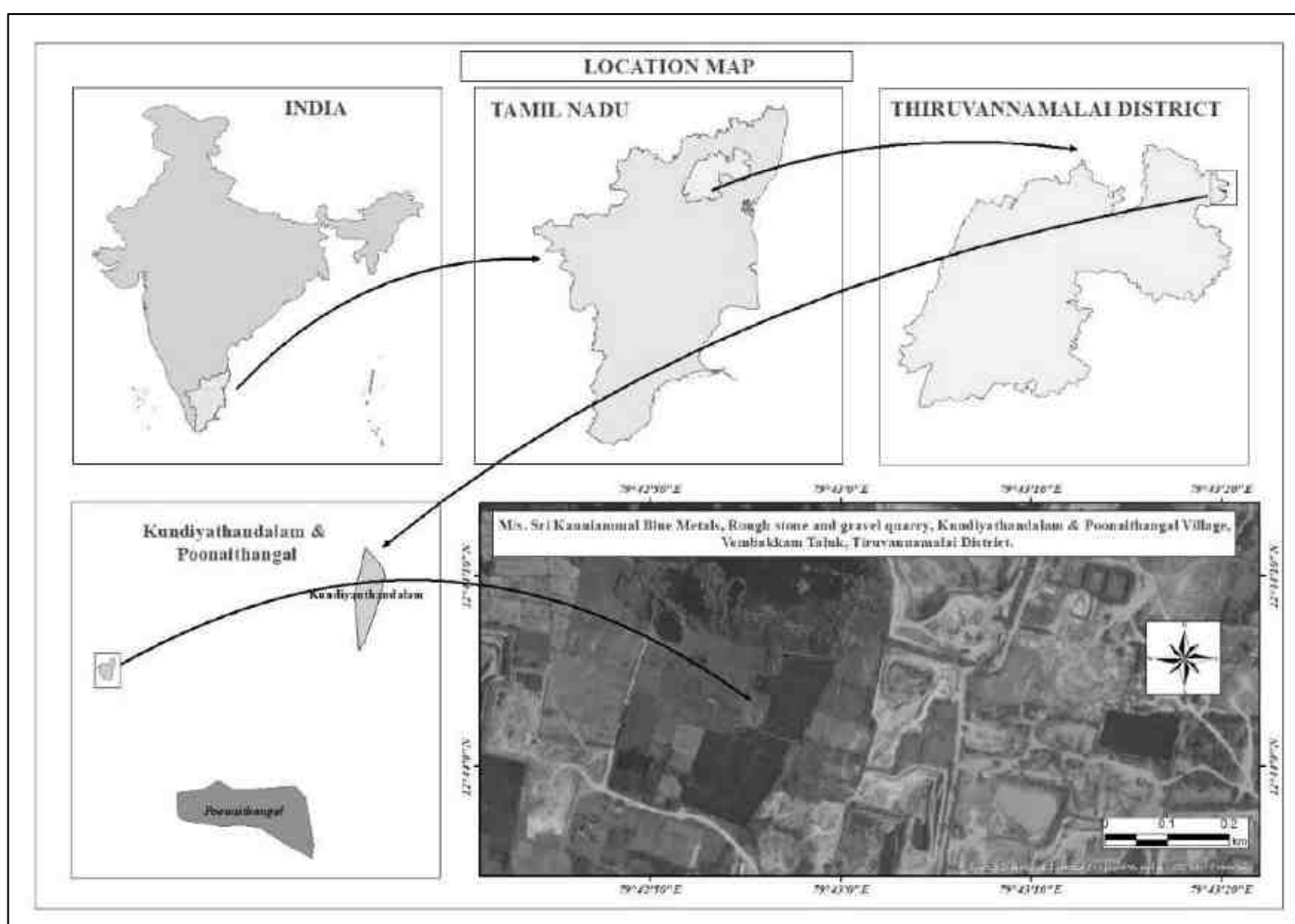


**Figure 2.1 Key Map Showing Location of Project Site**

To reach the site, start from uthiramerur in SH-118A – (Uthiramaerur-Kancheepuram road) upto 14.7km, from Perumanallur towards west via Seniyanallur, Suruttal and Poonathangal villages upto 3.3km nearby Seevalaperi temple, will find the site in the right side. Accessibility details to the proposed project site have been given in Table 2.2.

**Table 2.2 Site Connectivity to the Project Area**

|                         |                                      |           |
|-------------------------|--------------------------------------|-----------|
| Nearest Roadways        | NH-132B<br>Kancheepuram-Chengalpattu | 9.3km N   |
|                         | SH -118A<br>Kancheepuram-Uthiramerur | 3.3km E   |
| Nearest Town            | Kancheepuram                         | 11.0km N  |
| Nearest Railway Station | Kancheepuram                         | 11.5km N  |
| Nearest Airport         | Chennai                              | 57.1km NE |
| Nearest Seaport         | Chennai                              | 73.3km N  |
| Nearest Village         | Poonathangal                         | 1.1km N   |
|                         | Suruttal                             | 1.8km E   |
|                         | Bagavandapuram                       | 1.0km S   |
|                         | Valavandal                           | 2.8km W   |

## 2.2 LEASEHOLD AREA

The details of the field survey number, subdivision and their extent and the overall extent of the proposed project site is given in Table 2.3.

**Table 2.3 Lease hold area details**

| Survey No    | Sub Division | Total Extent in Hect | Patta No.                 | Village and Name of the Land Owner | Mine lease Applied S.F.No. | Mine lease Applied area out of total area in hect. |
|--------------|--------------|----------------------|---------------------------|------------------------------------|----------------------------|----------------------------------------------------|
| 162          | 1            | 0.11.0               | 918                       | Mr.K.Moorthy<br>S/o. Kannaiyan     | 162/1                      | 0.11.0                                             |
| 162          | 2A           | 0.07.0               |                           |                                    | 162/2A                     | 0.07.0                                             |
| 162          | 2B           | 0.02.5               |                           |                                    | 162/2B                     | 0.02.5                                             |
| 162          | 3            | 0.16.0               | 919                       |                                    | 162/3                      | 0.16.0                                             |
| 162          | 4            | 0.20.0               |                           |                                    | 162/4                      | 0.20.0                                             |
| 162          | 5A           | 0.10.5               |                           |                                    | 162/5A                     | 0.10.5                                             |
| 162          | 5B           | 0.07.0               | 162/5B                    |                                    | 0.07.0                     |                                                    |
| 162          | 6            | 0.08.0               | 918                       |                                    | 162/6                      | 0.08.0                                             |
| 162          | 7            | 0.11.5               | 919                       |                                    | 162/7                      | 0.11.5                                             |
| 162          | 8            | 0.22.0               |                           |                                    | 162/8                      | 0.22.0                                             |
| 162          | 10A1         | 0.49.0               |                           |                                    | 162/10A1                   | 0.49.0                                             |
| 162          | 10A2         | 0.21.0               | 674                       |                                    | 162/10A2                   | 0.21.0                                             |
| 162          | 10A3A        | 0.25.5               | 919                       |                                    | 162/10A3A                  | 0.25.5                                             |
| 162          | 10A3B        | 0.03.0               |                           |                                    | 162/10A3B                  | 0.03.0                                             |
| 117          | 12A2         | 0.42.0               | 312                       |                                    | 117/12A2                   | 0.42.0                                             |
| 144          | 1A           | 0.42.08              |                           |                                    | 144/1A                     | 0.42.08                                            |
| 144          | 2            | 0.40.5               |                           |                                    | 144/2                      | 0.40.5                                             |
| Total Extent |              | 3.38.58              | Applied lease area extent |                                    |                            | 3.38.58                                            |

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.

The overall extent of the project area is 3.38.58Ha as per the precise area communication letter vide Roc.No.172/Mines/2025 Dated 04.04.2025 issued by Dept of Geology and Mining, Tiruvannamalai District lies near the Kundiyathandalam & Poonathangal village, Vembakkam Taluk, Tiruvannamalai District, Tamil Nadu. The breakup of the existing land use for mining and ancillary feature is given in Table 2.3a.

**Table 2.3a Present Land use pattern of the project area**

| Sl. No. | Land Use                 | Present area (Hect.) |
|---------|--------------------------|----------------------|
| 1.      | Area under Mining        | Nil                  |
| 2       | Infrastructure           | Nil                  |
| 3       | Roads                    | Nil                  |
| 4       | Unutilized               | 3.38.58              |
| 5       | Green Belt               | Nil                  |
| 6       | Settling Tank & Drainage | Nil                  |
|         | <b>Grand Total</b>       | <b>3.38.58</b>       |

### 2.2.1 Geo Coordinates

The proposed lease area is flat topography. The maximum elevation (94m) was observed north side of the site. The boundary corner and the intermediate stone geographic coordinates is given in Table 2.4 and shown in Figure 2.5. The quarries within the cluster of 500m radius as per the letter Rc.No.172/Kanimam/2025 dated: 06.06.2025 is enclosed as Annexure II is shown in Figure 2.3.

**Table 2.4 Geographic coordinates of the Project area**

| Pillar ID | Latitude      | Longitude     | Pillar ID | Latitude     | Longitude     |
|-----------|---------------|---------------|-----------|--------------|---------------|
| 1         | 12°44'7.73"N  | 79°43'2.53"E  | 12        | 12°44'3.64"N | 79°42'56.30"E |
| 2         | 12°44'2.21"N  | 79°43'1.40"E  | 13        | 12°44'3.96"N | 79°42'55.27"E |
| 3         | 12°44'1.45"N  | 79°43'1.67"E  | 14        | 12°44'4.97"N | 79°42'55.44"E |
| 4         | 12°44'0.88"N  | 79°43'1.41"E  | 15        | 12°44'4.81"N | 79°42'56.07"E |
| 5         | 12°43'59.10"N | 79°43'0.89"E  | 16        | 12°44'4.95"N | 79°42'56.10"E |
| 6         | 12°43'59.51"N | 79°42'58.74"E | 17        | 12°44'4.82"N | 79°42'56.72"E |
| 7         | 12°43'59.80"N | 79°42'57.67"E | 18        | 12°44'6.06"N | 79°42'56.90"E |
| 8         | 12°44'0.02"N  | 79°42'57.57"E | 19        | 12°44'5.91"N | 79°42'58.01"E |
| 9         | 12°44'1.14"N  | 79°42'58.01"E | 20        | 12°44'5.65"N | 79°42'59.88"E |
| 10        | 12°44'1.33"N  | 79°42'57.55"E | 21        | 12°44'8.20"N | 79°43'0.97"E  |
| 11        | 12°44'1.85"N  | 79°42'55.71"E | --        | --           | --            |



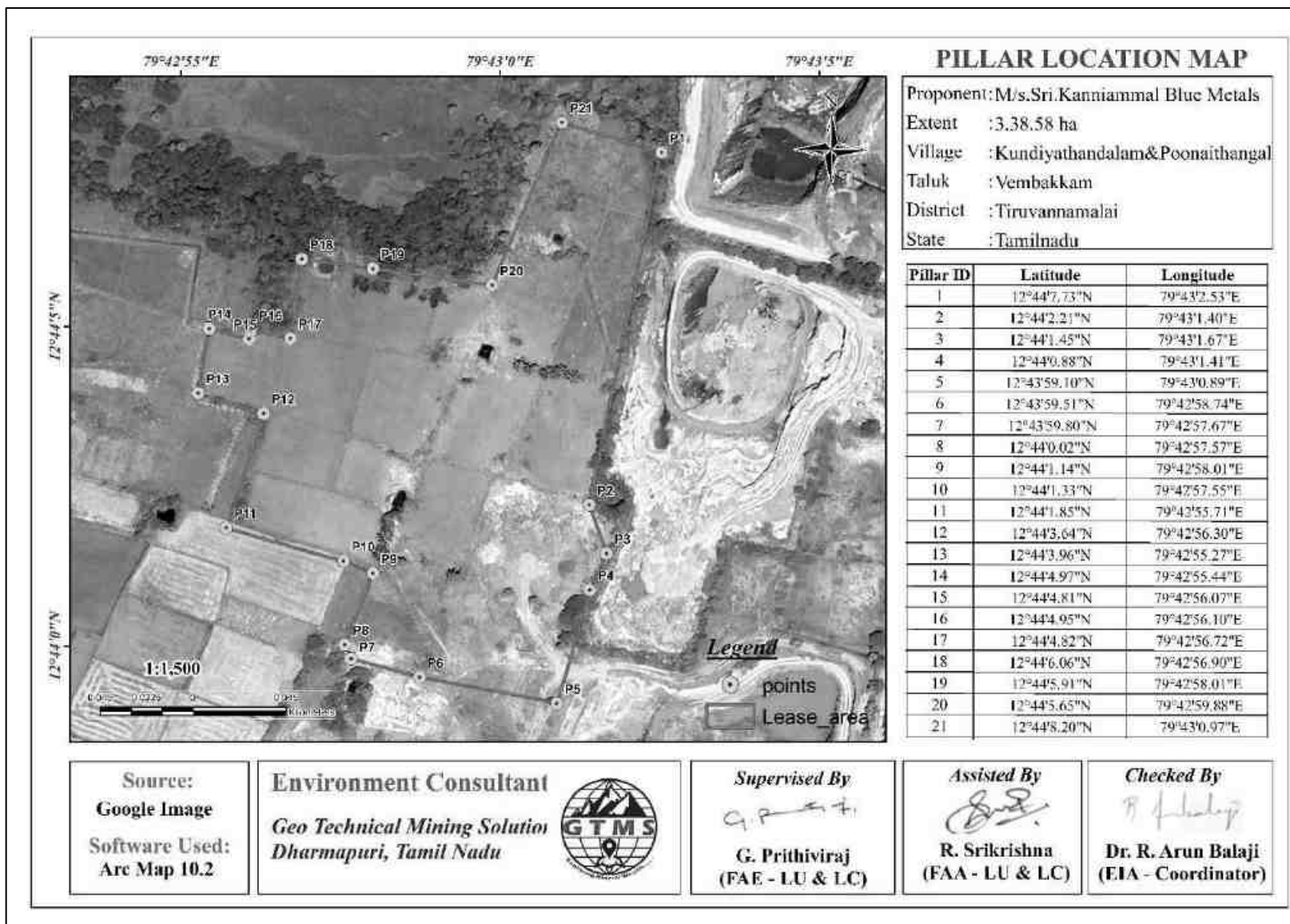


Figure 2.2 Google Earth Image Showing Pillar Coordinates of Lease Area

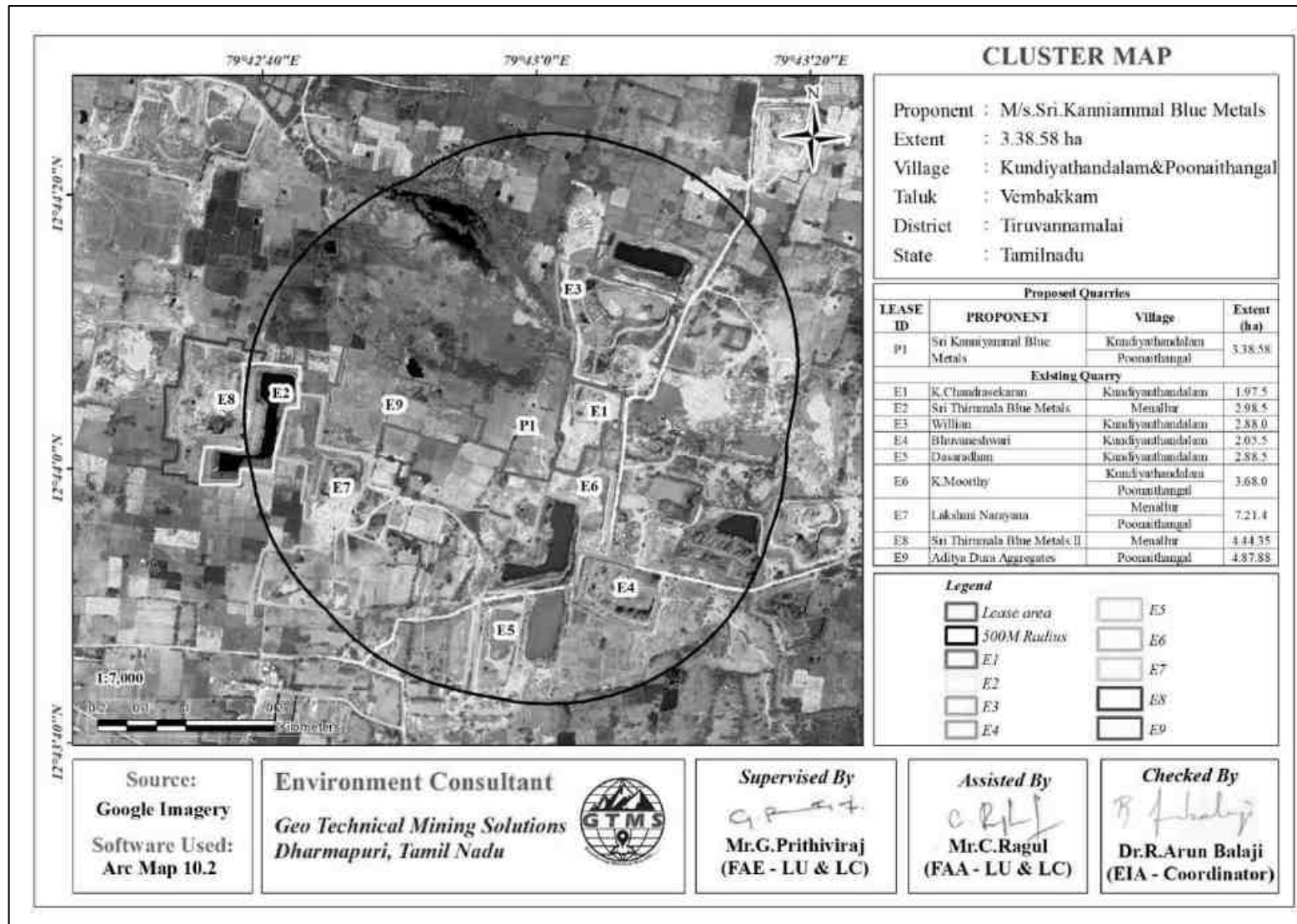


Figure 2.3 Google Earth Image of the cluster



## 2.3 GEOLOGY

The entire district is underlain by the rocks belonging to hard crystalline rock masses of Archean age. General characteristics of the rocks of this series has recorded that the rocks are in general bluish grey or darkish in colour and extremely fresh in appearance with an even grained granular structure. Charnockite, any member of a series of metamorphic rocks with variable chemical composition, the term is often limited to the characteristic ortho pyroxene granite of the series. The alkali feldspar may be intermediate between microcline and orthoclase, the fine micro perthitic texture being common.

Order of superposition of the proposed lease.

| Age                  | Group             | Rock Formation |
|----------------------|-------------------|----------------|
| Recent to Sub recent | ----              | Gravel         |
| Archean              | Charnockite Group | Charnockites   |

The gravel available at a depth of 0.5m followed by gravel exists up to a depth of 5m and the rough stone occurs at a depth of 5m below ground level.

## 2.4 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 45m below the ground level considering there is no waste / overburden / side burden (100% Recovery anticipated) for the proposed project. The results of geological resources and reserves is given in Table 2.5 and the approved year wise development plan is enclosed as Figure 2.5 & 2.5a.

**Table 2.5 Estimated Resources and Reserves of the Project**

| Resource Type                                         | Rough Stone in m <sup>3</sup> & Tons | Gravel in m <sup>3</sup> & Tons |
|-------------------------------------------------------|--------------------------------------|---------------------------------|
| Geological Resource in (m <sup>3</sup> & Ts)          | 1523250 & 4188938                    | 169250 & 338500                 |
| Mineable Reserves in (m <sup>3</sup> & Ts)            | 296860 & 816365                      | 82550 & 165100                  |
| Proposed production for 5 years (m <sup>3</sup> & Ts) | 296860 & 816365                      | 82550 & 165100                  |

*Source: Approved Mining Plan & ToR*

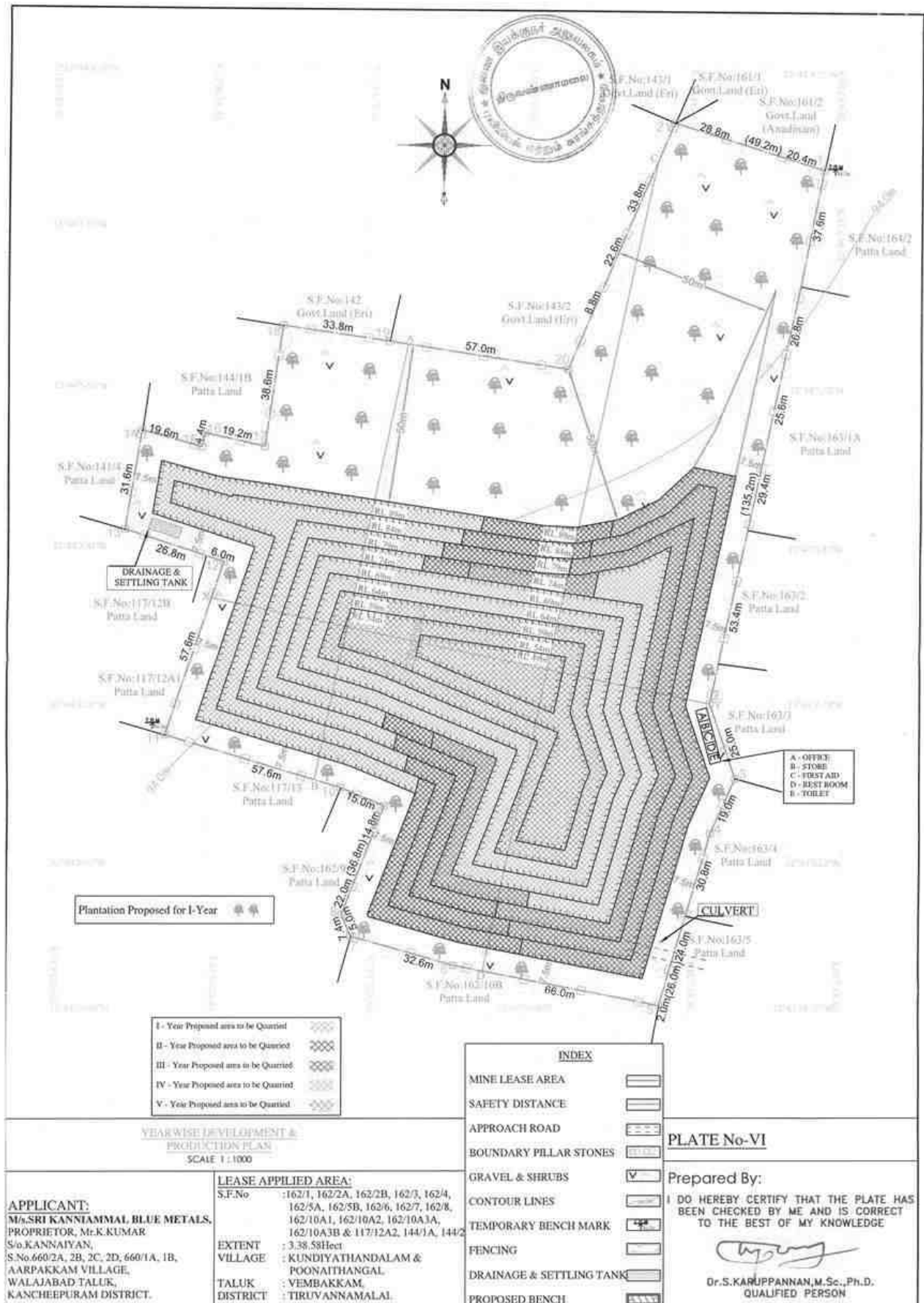


Figure 2.5 Year wise Development & Production Plan

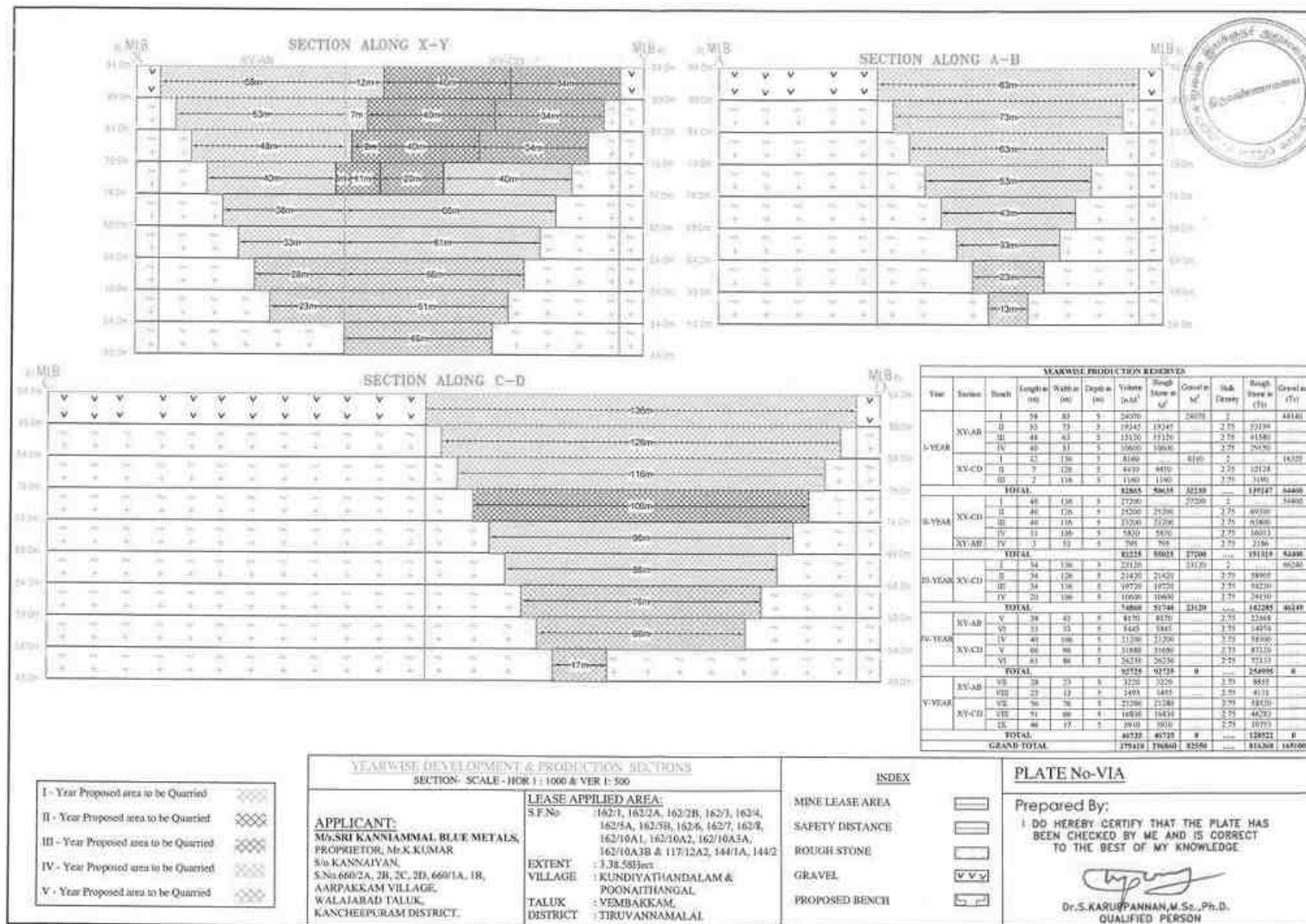


Figure 2.5a Year wise Development & Production Section

## **2.5 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 5m 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.

### **2.5.1 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 is given in Table 2.6.

**Table 2.6 Conceptual Blasting Design**

|                               |      |
|-------------------------------|------|
| Blast hole Diameter (D) in mm | 32   |
| Burden (B) in m               | 1.5  |
| Spacing (S) in m              | 1.3  |
| Sub drill in m                | 0.45 |
| Charge length (C) in m        | 0.64 |
| Stemming                      | 1.5  |
| Hole Length (L) in m          | 2.6  |
| Bench Height (BH) in m        | 2.1  |



|                                                 |           |
|-------------------------------------------------|-----------|
| Mass of explosive/hole in g                     | 400       |
| Stemming material size in mm                    | 3.2       |
| Burden stiffness ratio                          | 1.43      |
| Blast volume/hole in m <sup>3</sup>             | 4.16      |
| Production of rough stone/day in m <sup>3</sup> | 220       |
| Number of blast holes/day                       | 53        |
| Blast hole pattern                              | Staggered |
| Mass of explosive /day in kg                    | 21.16     |
| Powder factor in kg/m <sup>3</sup>              | 0.10      |
| Loading density                                 | 0.63      |
| Type of explosives                              | Slurry    |
| Diameter of packaging in mm                     | 25        |
| Initiation system                               | NONEL     |
| Fly rock distance in m                          | 19        |

#### **Statutory Provision & Precaution during Blasting: -**

- Blasting permission from DGMS will be taken by the proponent within 6 months from the date of execution of mine.
- Control blasting will be carried out by using delay detonators during multi rows blasting
- No secondary blasting will be carried out.
- Stemming column will be half of the depth of hole with coarse sand.
- Only Statutory designated Blaster will supervise the blasting operation.
- All persons in the radius of minimum 300m from the blasting site will be removed by siren.
- Blasting operation will be carried out during day time only particularly at noon time .

#### **2.5.2 Magnitude of Operation**

Based on the results of estimated production the details about the size of operation had provided in Table 2.7.

**Table 2.7 Operational Details for Proposed Project**

|                                        | <b>Rough Stone (m<sup>3</sup>) &amp; Ts /<br/>5 years</b> | <b>Gravel (m<sup>3</sup>) &amp; Ts /<br/>3 years</b> |
|----------------------------------------|-----------------------------------------------------------|------------------------------------------------------|
| Proposed production                    | 296860                                                    | 82550                                                |
| Number of Working Days                 | 270                                                       | 270                                                  |
| Production /Day (m <sup>3</sup> ) & Ts | 220                                                       | 102                                                  |
| No. of Lorry Loads                     | 37                                                        | 17                                                   |

**2.5.3 Extent of Mechanization**

List of machineries proposed for the quarrying operation is given in Table 2.8.

**Table 2.8 Machinery Details**

| <b>S. No.</b>                            | <b>Type</b>  | <b>No. of<br/>Unit</b> | <b>Size/Capacity</b>     | <b>Dia of Hole<br/>(mm)</b> | <b>Motive<br/>Power</b> |
|------------------------------------------|--------------|------------------------|--------------------------|-----------------------------|-------------------------|
| 1                                        | Jack Hammers | 2                      | Hand Held                | 32mm                        | Diesel                  |
| 2                                        | Compressor   | 2                      | AIR                      | ---                         | Diesel                  |
| 3                                        | Excavator    | 2                      | 2.9 - 4.5 m <sup>3</sup> | ---                         | Diesel                  |
| <b>Haulage &amp; Transport Equipment</b> |              |                        |                          |                             |                         |
| 4                                        | Tipper       | 8                      | ---                      | ---                         | Diesel                  |

**2.5.4 Post mining land use**

The land use at present, at the end of plan period & at the end of conceptual period is given in Table 2.9 below

**Table 2.9 Land Use at the end of mine Life**

| <b>Description</b>       | <b>Present Area (ha)</b> | <b>Area at the end of life of quarry<br/>(ha)</b> |
|--------------------------|--------------------------|---------------------------------------------------|
| Area under quarry        | Nil                      | 1.95.5                                            |
| Infrastructure           | Nil                      | 0.02.0                                            |
| Roads                    | Nil                      | 0.03.0                                            |
| Unutilized               | 3.38.58                  | Nil                                               |
| Green Belt               | Nil                      | 1.29.88                                           |
| Drainage & Settling Tank | Nil                      | 0.08.2                                            |
| <b>Total</b>             | <b>3.38.58</b>           | <b>3.38.58</b>                                    |

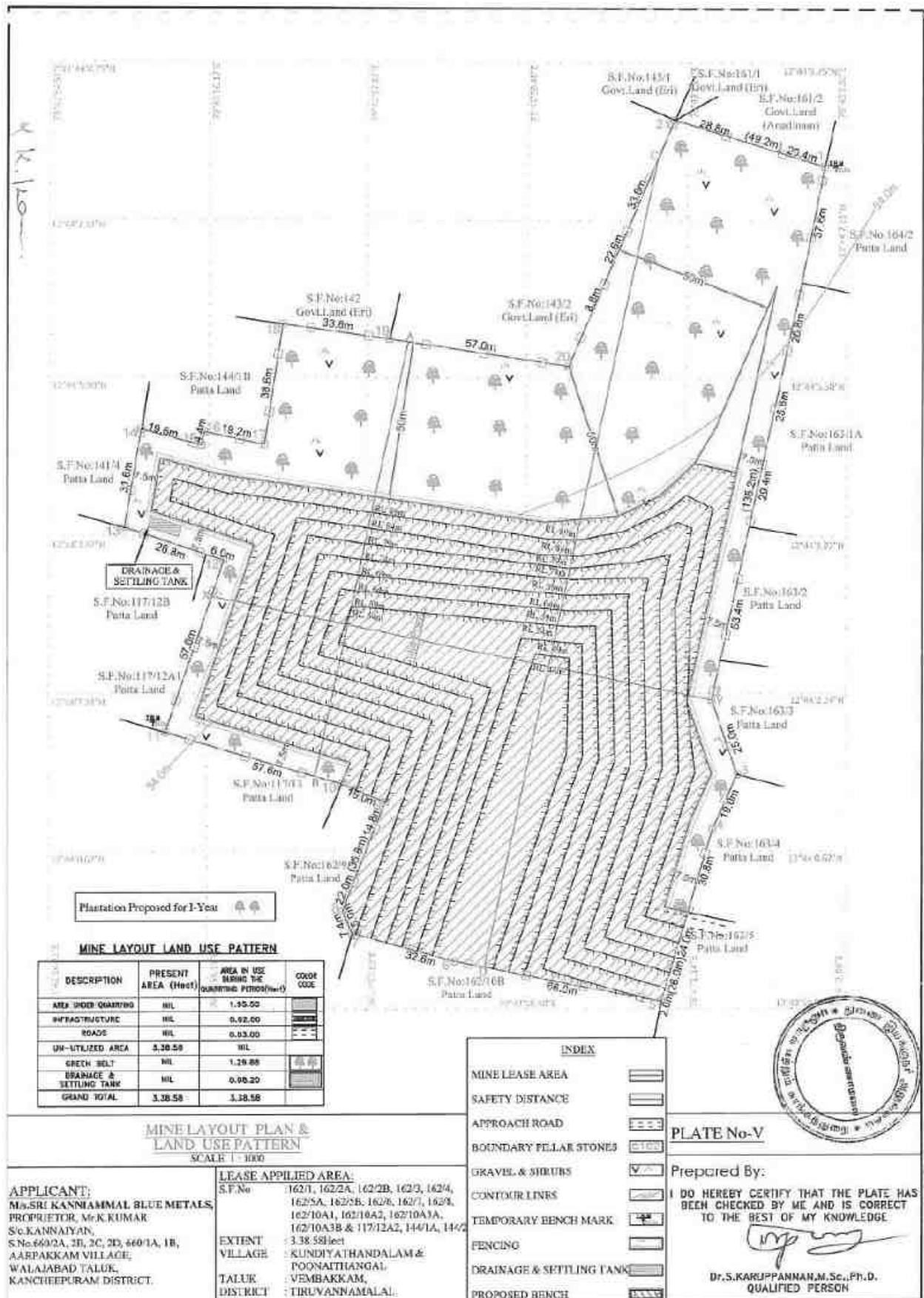


Figure 2.6 Mine Layout Plan and Land Use Pattern

### 2.5.5 Conceptual Mining Plan

The ultimate pit size is designed based on certain practical parameters such as economical depth of mining, safety zones, permissible area, etc. The ultimate pit dimension is provided in Table 2.10.

**Table 2.10 Ultimate Pit Dimension**

| Pit | Length (m) | Width (m) | Depth (m) |
|-----|------------|-----------|-----------|
| I   | 86         | 145       | 45        |

*Source: Approved Mining Plan & ToR*

### 2.5.6 Infrastructures

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

#### ***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.

### 2.5.7 Water Requirement

Details of water requirement in 3.5 KLD is given in Table 2.11.

**Table 2.11 Water Requirement for the Project**

| Purpose                | Quantity       | Source                                         |
|------------------------|----------------|------------------------------------------------|
| Dust Suppression       | 1.0 KLD        | Existing bore wells nearby the lease area      |
| Green Belt development | 1.0 KLD        | Existing bore wells nearby the lease area      |
| Drinking & Domestic    | 1.5 KLD        | Existing bore wells and approved water vendors |
| <b>Total</b>           | <b>3.5 KLD</b> |                                                |

*Source: Prefeasibility Report*

### 2.5.8 Energy Requirement

High speed Diesel (HSD) will be used for quarrying machineries. As per the data shown in Table 2.12 Around **22,66,732 litres of HSD** will be used for rough stone extraction during 10 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<br/>(296860 m<sup>3</sup>)</b> | <b>Gravel<br/>(82550 m<sup>3</sup>)</b> | <b>Total Diesel<br/>(litre)</b> |
| Average Rate of Fuel Consumption (1/hr)                             | 16                                            | 10                                      | ---                             |
| Working Capacity (m <sup>3</sup> /hr)                               | 20                                            | 60                                      | ---                             |
| Time Required (hours)                                               | 59372                                         | 1376                                    | ---                             |
| Total Diesel Consumption for 5 years (litre)                        | 949952                                        | 13760                                   | <b>963712</b>                   |
| <b>Fuel Requirement for Compressor</b>                              |                                               |                                         |                                 |
| Average Rate of Fuel Consumption/hole (litre)                       | 0.4                                           | ---                                     | ---                             |
| Number of Drill holes/day                                           | 53                                            | ---                                     | ---                             |
| Total Diesel Consumption for 5 years (litre)                        | 28620                                         | ---                                     | <b>28620</b>                    |
| <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                                              | 37                                            | 17                                      | ---                             |
| Number of Trips / 5 years                                           | 49950                                         | 13770                                   | ---                             |
| Total Diesel Consumption for 5 years (litre)                        | 999000                                        | 275400                                  | <b>1274400</b>                  |
| <b>Total Diesel Consumption by Excavator, Compressor and Tipper</b> |                                               |                                         | <b>22,66,732</b>                |

**2.5.9 Capital Requirement**

The project proponent will invest Rs. **72,28,000/-** to the project. The breakup summary of the investment has been given in Table 2.13.

**Table 2.13 Capital Requirement Details**

| <b>S. No.</b>             | <b>Description</b>      | <b>Cost (Rs.)</b>  |
|---------------------------|-------------------------|--------------------|
| 1                         | Fixed Asset Cost        | 25,00,000/-        |
| 2                         | Machinery cost (Rental) | 20,00,000/-        |
| 3                         | EMP Cost                | 27,28,000/-        |
| <b>Total Project Cost</b> |                         | <b>72,28,000/-</b> |

Source: *Approved Mining Plan*

**2.6 MANPOWER REQUIREMENT**

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

**Table 2.14 Employment Potential for the Proposed Project**

| S. No.       | Category       | Role             | Nos.      |
|--------------|----------------|------------------|-----------|
| 1.           | Highly Skilled | Mine manager     | 1         |
|              |                | Mine Engineer    | 1         |
|              |                | Mine Geologist   | 1         |
|              |                | Blaster          | 1         |
| 2.           | Unskilled      | Musdoor/ Labours | 18        |
| <b>Total</b> |                |                  | <b>22</b> |

*Source: Prefeasibility Report*

## 2.7 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 in 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*

## 2.8 ORGANIZATION CHART FOR THE PROJECT

The organization chart which allocates the duties and responsibilities of the individuals

| S.No. | Statutory Official /Competent Person | Role / Responsibility                                                                                                                                                                                                                                                                                                                         |
|-------|--------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1     | Project Proponent                    | <ul style="list-style-type: none"><li>• Overall incharge for the mining and administration activities,</li><li>• instructing the manager and other officials regarding the safety precautions,</li><li>• inspecting the mining area, labour sheds and sanitation facilities regularly,</li><li>• ensuring safe working environment.</li></ul> |
| 2     | Mine Manager                         | <ul style="list-style-type: none"><li>• Executing the instructions given by the proponent,</li><li>• ensuring the availability of first aid kits and other safety provisions,</li><li>• arrangement of safe and pure drinking water,</li><li>• supervising the overall activities of the labours in the mine site.</li></ul>                  |
| 3     | Mine Geologist                       | <ul style="list-style-type: none"><li>• Ensuring the mining activity as per the approved mining plan.</li></ul>                                                                                                                                                                                                                               |
| 4     | Mine Engineer                        | <ul style="list-style-type: none"><li>• Ensuring the safe working of the machineries like DG sets, excavators, compressor drillers etc. in the mine site,</li><li>• maintenance of loading vehicles and check the smoke emissions,</li><li>• ensuring the working of the CCTV cameras in the mine site.</li></ul>                             |
| 5     | Blaster/Foreman                      | <ul style="list-style-type: none"><li>• Carryout the controlled and safe blasting in mine site,</li><li>• alerting the mining area before the blasting,</li><li>• maintaining the regular time for blasting,</li><li>• ensuring the travel of fly rock within the planned area.</li></ul>                                                     |
| 6     | Watchman/Security                    | <ul style="list-style-type: none"><li>• Restricting the entry of the public in the mine site,</li><li>• recording the movements of the loading and other vehicles into the mine site,</li><li>• ensuring the loaded vehicle covered with tarpaulin while passing out the gate.</li></ul>                                                      |
| 7     | Labour 1                             | <ul style="list-style-type: none"><li>• Maintenance of labour sheds, toilets, mines office, garland drainage and settling tank, regular sprinkling on roads,</li><li>• watering of plants regularly and maintain the green belt.</li></ul>                                                                                                    |
| 8     | Other labours                        | <ul style="list-style-type: none"><li>• Carry out the mining work as per the instructions.</li></ul>                                                                                                                                                                                                                                          |

involved in this project is displayed below,

## 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 2025 with CPCB** guidelines. Environmental baseline data were collected by an NABL accredited and MoEF notified **Interstellar Testing Centre Pvt. Ltd** for the environmental attributes including soil, water, air, and noise and by FAEs for ecology and biodiversity, traffic, and socio-economy.

#### *Study Area*

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

**Table 3.1 Monitoring Attributes and Frequency of Monitoring**

| Attribute               | Parameters                                                      | Frequency of Monitoring            | No. of Locations                       | Protocol                                                                                           |
|-------------------------|-----------------------------------------------------------------|------------------------------------|----------------------------------------|----------------------------------------------------------------------------------------------------|
| Land Use/<br>Land Cover | Land-use<br>Pattern within<br>10 km radius of<br>the study area | Once during<br>the study<br>period | Study Area                             | Satellite Imagery &<br>Primary Survey                                                              |
| *Soil                   | Physico-<br>Chemical<br>characteristics                         | Once during<br>the study<br>period | 5<br>(1 in core & 4<br>in buffer zone) | IS 2720<br>Agriculture<br>Handbook - Indian<br>Council of<br>Agriculture<br>Research, New<br>Delhi |
| *Water<br>Quality       | Physical,<br>Chemical and<br>Bacteriological<br>Parameters      | Once during<br>the study<br>period | 5<br>(2 surface<br>water & 2           | IS 10500& CPCB<br>Standards                                                                        |



|                              |                                                                                                                       |                                                                   |                                  |                                                                                             |
|------------------------------|-----------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------|----------------------------------|---------------------------------------------------------------------------------------------|
|                              |                                                                                                                       |                                                                   | ground water,<br>waste water 1)  |                                                                                             |
| Meteorology                  | Wind speed<br>Wind direction<br>Temperature<br>Cloud cover<br>Dry bulb<br>temperature<br>Rainfall                     | 1 hourly<br>continuous<br>mechanical/automatic weather<br>station | 1                                | Site specific primary<br>data &<br>secondary data from<br>IMD Station                       |
| *Ambient<br>Air Quality      | PM <sub>10</sub> PM <sub>2.5</sub> SO <sub>2</sub><br>NO <sub>x</sub>                                                 | 24 hours, twice<br>a week                                         | 7<br>(1 core & 6<br>buffer)      | IS 5182 Part 1-23<br>National Ambient<br>Air Quality<br>Standards, CPCB                     |
| *Noise<br>Levels             | Ambient noise                                                                                                         | Hourly<br>observation for<br>24 hours per<br>location             | 7<br>(1 core & 6<br>buffer zone) | IS 9989<br>As per CPCB<br>Guidelines                                                        |
| Ecology                      | Existing flora<br>and fauna                                                                                           | Through field<br>visit during the<br>study period                 | Study area                       | Primary Survey by<br>Quadrat &<br>Transect Study<br>Secondary Data –<br>Forest Working Plan |
| Socio<br>Economic<br>Aspects | Socio-economic<br>characteristics,<br>Population<br>statistics and<br>existing<br>infrastructure in<br>the study area | Site visit &<br>Census<br>Handbook,<br>2011                       | Study area                       | Primary Survey,<br>census handbook &<br>need based<br>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

The geology of the study area showcases a diverse geology with ancient Precambrian crystalline rocks (charnockite, gneisses, khondalites) in southern areas and younger sedimentary formations (Cuddalore Gondwana) covering deeper crystalline basement in the north scattered with Pliocene gravels (Kanjeevaram Gravels) and recent alluvium/laterites illustrating superposition from oldest basement rocks to youngest surface deposits in this South Indian Shield region.

The geological superposition from oldest (bottom) to youngest (top):

1. Archaean Crystalline Basement: The oldest rocks consisting of Charnockites (metamorphosed igneous rocks), Garnetiferous Biotite Gneisses and Migmatite complexes form the deep foundation.

2. Gondwana Supergroup: Sedimentary rocks deposited over the basement indicating ancient river/delta environments.
3. Cuddalore Formation (Mio-Pliocene): Mio-Pliocene age sediments, often fluvial (river-deposited).
4. Kanjeevaram Gravels (Pliocene-Lower Pleistocene): Gravel and shingle beds a distinct local deposit.
5. Laterite & Alluvium (Quaternary): Youngest deposits including lateritic soils and river alluvium (silts) covering the surface.

The geology of the study area and the proposed area is shown in **Figure 3.1**.

### **Geomorphology:**

The lease area occurs in shallow weathered pediplain of nearly level terrain with low gradient. These are covered with shallow weathering material ranging from 0 to 5 m. The top soil is generally red soil. The core area soil is fine loamy mixed typic haplustalfs and fine mixed typic rhodustalfs classified in USDA soil taxonomy.

Soils (Alfisols) that are fertile (argillic horizon) have reddish hues (Rhodustalfs have redder tops) fine-loamy texture and are found in semi-arid regions with specific moisture/temperature characteristics indicating important differences in color, mineralogy (mixed) and management needs for agriculture. Most of the study area is occupied by this unit. The geomorphology of the study area is given in **Figure 3.2**.

### **3.1.2 Land Use/ Land Cover**

The study area (10 km radius, approximately **32,100 ha**) around the proposed mine site was classified into seven **LULC classes** using Sentinel II imagery. The distribution is dominated by **crop land**, which accounts for over two-thirds of the area.

#### **Areal Coverage by LULC Class**

- Crop Land: The dominant feature, comprising the maximum area of 21,710ha (67.41%).
- Built-up Area: The second largest class covering 4,977 ha (15.45%).
- Fallow Land: FL Accounts for 3,007 ha (9.34%) of the landscape.
- Water Bodies: Including major flows and small tanks totalling 1,746 ha (5.42%).
- Mining Area: Covers 455.84 ha, representing the least percentage of the total area (1.42%).
- Sparse Vegetation: Covers 218 ha (0.68%).
- Barren Land: The smallest naturally occurring class, with 90 ha (0.28%).

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

| S. No.       | Classification   | 2025             |            |
|--------------|------------------|------------------|------------|
|              |                  | Area in Hectares | Area in %  |
| 1            | Water Bodies     | 1746.00          | 5.42       |
| 2            | Vegetation cover | 218.00           | 0.68       |
| 3            | Crop Lands       | 21710.00         | 67.41      |
| 4            | Mining area      | 455.84           | 1.42       |
| 5            | Built-up Area    | 4977.00          | 15.45      |
| 6            | Barren Land      | 90.00            | 0.28       |
| 7            | Fallow land      | 3007.00          | 9.34       |
| <b>Total</b> |                  | <b>32203.84</b>  | <b>100</b> |

Source: Sentinel II Satellite Imagery

The LULC changes within a 10 km radius study area between 2020 and 2025 is given in Table 3.2a. The data suggests a notable shift from agricultural land toward industrial/mining activities and urban development alongside a significant increase in water bodies formed by reclaimed mining pits.

#### Key LULC Change Observations (2020 – 2025)

**Table 3.2a Comparison of LULC 2020 - 2025**

| LULC Class                  | 2020 Area (ha)       | LULC 2020 in %       | 2025 Area (ha) | LULC 2025 in % | Change Trend         |
|-----------------------------|----------------------|----------------------|----------------|----------------|----------------------|
| Crop Land                   | 23,746.56            | 73.74%               | 21,710         | 67.41%         | Decrease             |
| Built-up Area               | 4,012.56             | 12.46%               | 4,977          | 15.45%         | Increase             |
| Water Bodies (Unclassified) | ~641*                | 1.99%                | 1,746          | 5.42%          | Significant Increase |
| Fallow Land                 | <i>Not specified</i> | <i>Not specified</i> | 3,007          | 9.34%          | Decrease noted       |
| Barren Land                 | <i>Not specified</i> | <i>Not specified</i> | 90             | 0.28%          | Decrease noted       |

\*Approximation based on 2020 percentage of total area (~32,100 ha).

Source: Sentinel II Satellite Imagery

#### Interpretation of Changes

The change in LULC in the year 2020 and 2025 in Figure 3.3 and Figure.3.3a shows a

- **Shift in Economy:** The decrease in crop lands by over 2,000 ha and increase in mining/industrial areas is attributed to a changing occupational structure. The study suggests that less profitable farming with uncertain yields is driving people towards other economic activities like mining and related industries.

- **Economic Growth Indicators:** The rise in built-up areas is cited as evidence of an increase in the regional economy level fueled by demand for building materials (stones and sand) for infrastructure development.
- **Land Use Optimization:** The reduction in barren and fallow lands indicates that previously unproductive areas are being utilized for productive activities.
- **Innovative Water Management:** The significant increase in unclassified water bodies (a rise of over 3.4 percentage points) is clarified as the use of mined-out open pits as effective rainwater harvesting structures.

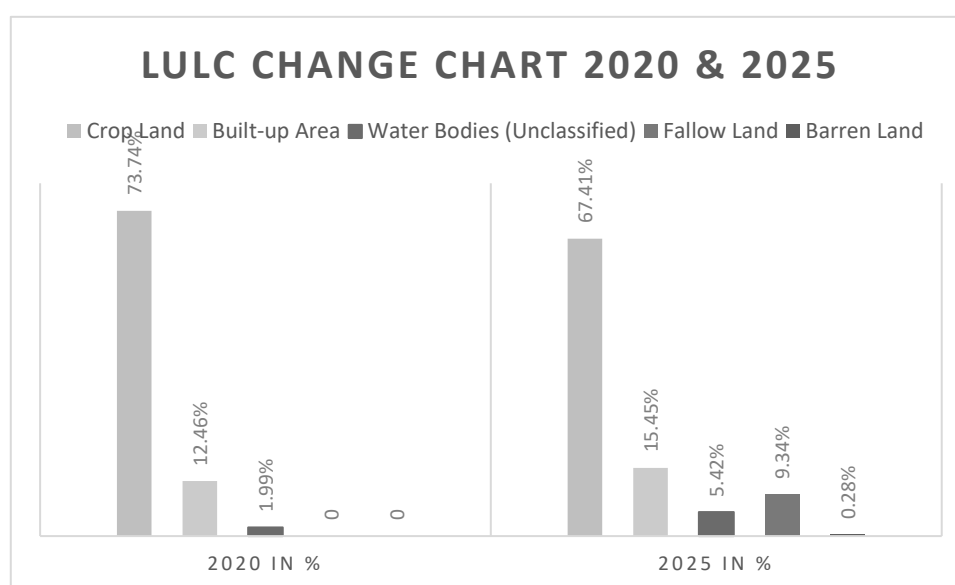


**Figure 3.0 Change in LULC chart 2020 and 2025.**

### Shortcomings:

- A study finds rural settlement growth causes 3.5 times more biodiversity loss than that associated with urban expansion.
- Low-density expansion fragments natural habitats more widely than urban development. Rural expansion tends to be scattered and low-density, spreading indirect impacts (like habitat fragmentation, noise, and light) over a much larger landscape than compact urban growth.
- Rural growth has spread faster into Key Biodiversity Areas than urban expansion.
- Rural expansion often enables small-scale but widespread illegal logging, quarrying, and resource harvesting, whose cumulative impact degrades ecosystems.
- Environmental impact assessments and land-use planning largely focus on cities, industries and large infrastructure projects. Rural settlement growth remains poorly regulated even when it occurs in biodiversity-rich landscapes

### 3.1.3 Topography

The study area is primarily characterized as a flat low-lying coastal plain with a terrain suitable for extensive agriculture. The topographical features of the study area

- **General Terrain:** The landscape is predominantly an undulating plain featuring numerous natural depressions used as irrigation tanks which are central to the region's agricultural viability.
- **Elevation and Slope:** The area maintains a low elevation sitting approximately at 83.2 meters (273 ft) above sea level. The land exhibits a gentle slope primarily towards the south and east.
- **Hills/Major Elevations:** The area is essentially a plain area lacking significant hills. The minor intermittent hill named Mamandur is known for its ancient cave temples to 7<sup>th</sup> century CE is located in the southern side of the study area.
- **Soil Composition:** The presence of fertile soil a mix of clay, loam and sand combined with the effective utilization of the irrigation tanks supports robust agricultural practices.

The project site is predominantly flat with its maximum elevation of 94 meters located on the north side of the site. The slope is towards south side and falls in Toposheet no. **57 P/10** and the topo-map is given in Figure 3.5.

### 3.1.4 Drainage Pattern

"The study area's drainage pattern is influenced by two major seasonal rivers. The drainage pattern is concordant and is characterized by a **sub-dendritic system** with first-order streams."

*(A dendritic drainage pattern is the most common type and resembles the branching pattern of a tree. It typically forms in regions with homogeneous (uniform) underlying rock material where erosion occurs at a similar rate in all directions and the river channel follows the general slope of the terrain. The term "sub-dendritic" suggests a variation of this pattern likely still following the general slope and rock characteristics but perhaps with minor structural influences not significant enough to form a completely different pattern like trellis or rectangular.)*

#### Key Drainage Features of the Study Area

- **Major Water Flows:** The area is situated strategically between two primary surface water flows:
  - The Palar River to the North.
  - The Cheyyar River to the South.

The **Palar Basin** is one of the most important of the 12 basins that lie between the **Pennar** and Cauvery basins.

- There are three primary geographical divisions in this basin:
  - the Eastern Ghats hill ranges
  - the plateau area
  - the coastal plains.
- Though the majority of the drainage region is in Tamil Nadu it also includes sections of **Karnataka and Andhra Pradesh** in the southeast and southwest respectively.
- The basin has a rhombus form and empties into the **Bay of Bengal** at vayalur named as kuvattur village.
- The **Palar River** basin's typical rainfall is modest. Droughts used to be common in this river basin. Although the river does not often flood significant rains have caused it to flood for up to six months. Dams have been built along the river's course particularly in Tamil Nadu to provide irrigation. Vellore, Arcot and Chengalpattu are the main towns along the river's banks.
- However, droughts in **Karnataka and Tamil Nadu** have been reduced by the construction of several small and medium **irrigation reservoirs**.
- Water availability for both surface and **groundwater irrigation** has improved as a result of this.
- The cheyyar river a major tributary of the Palar rises in Tamil Nadu's Jawadhu Hills.



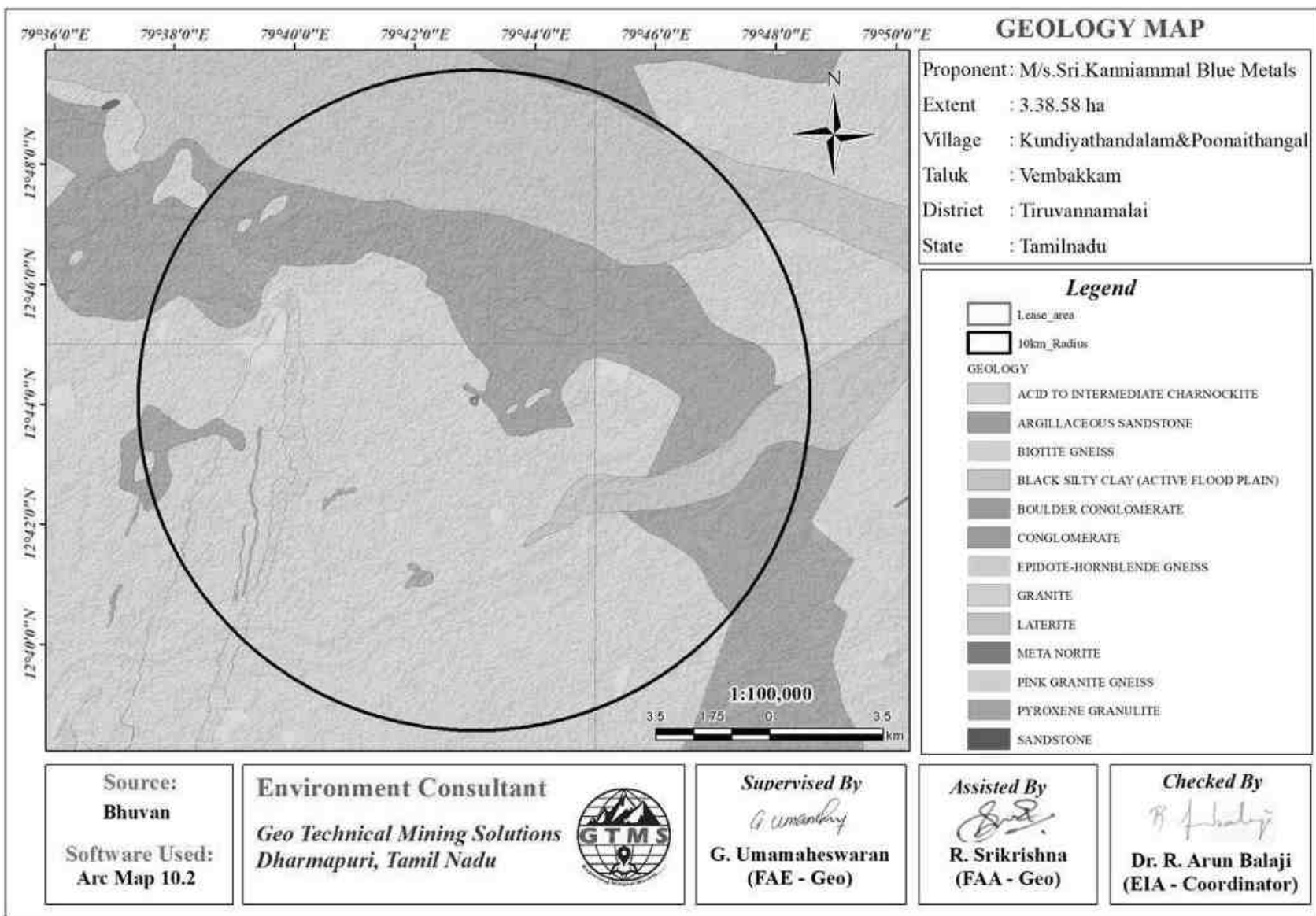


Figure 3.1 Geology Map with 10km Radius around Proposed Project Site

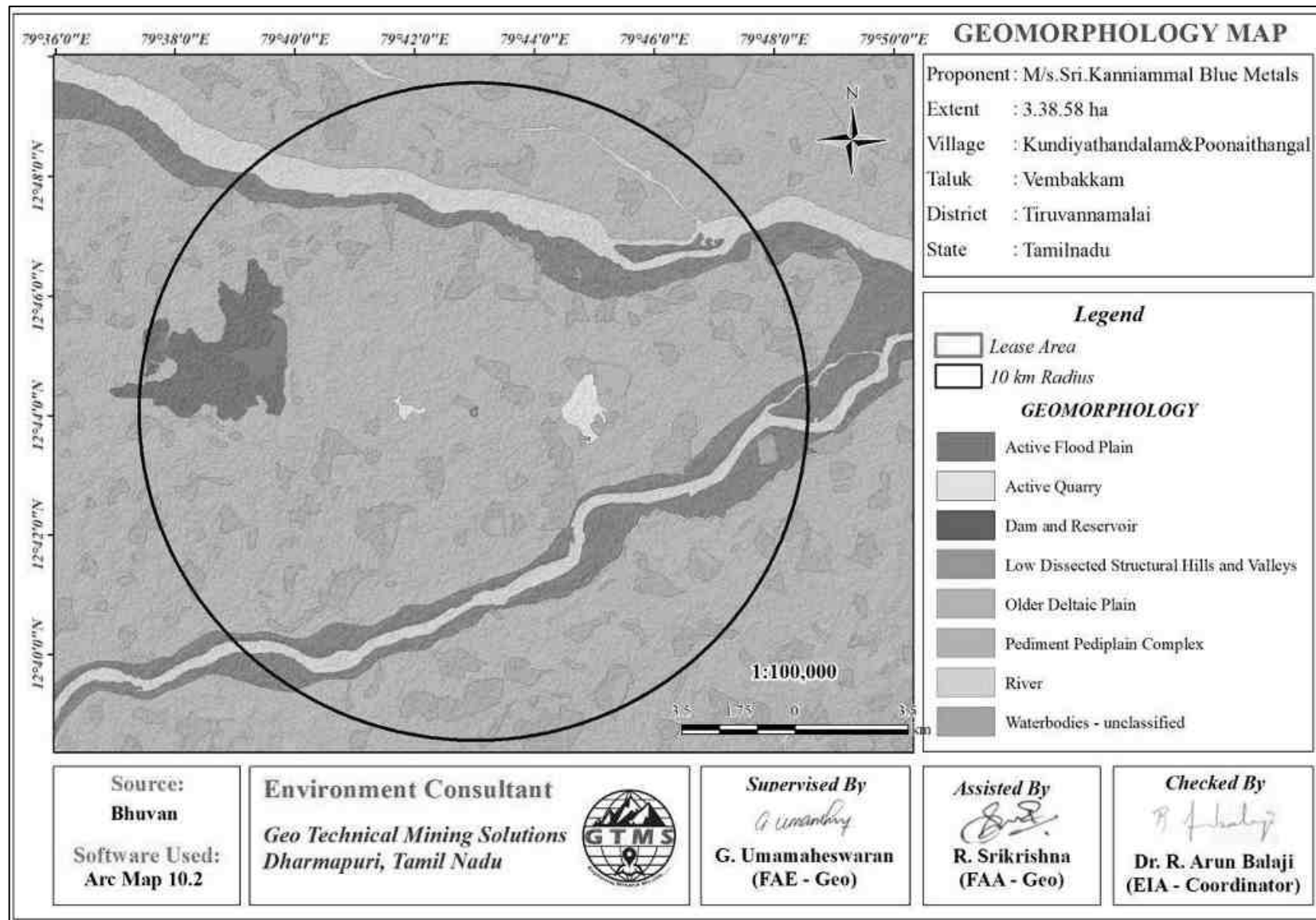


Figure 3.2 Geomorphology Map with 10km Radius around Proposed Project Site



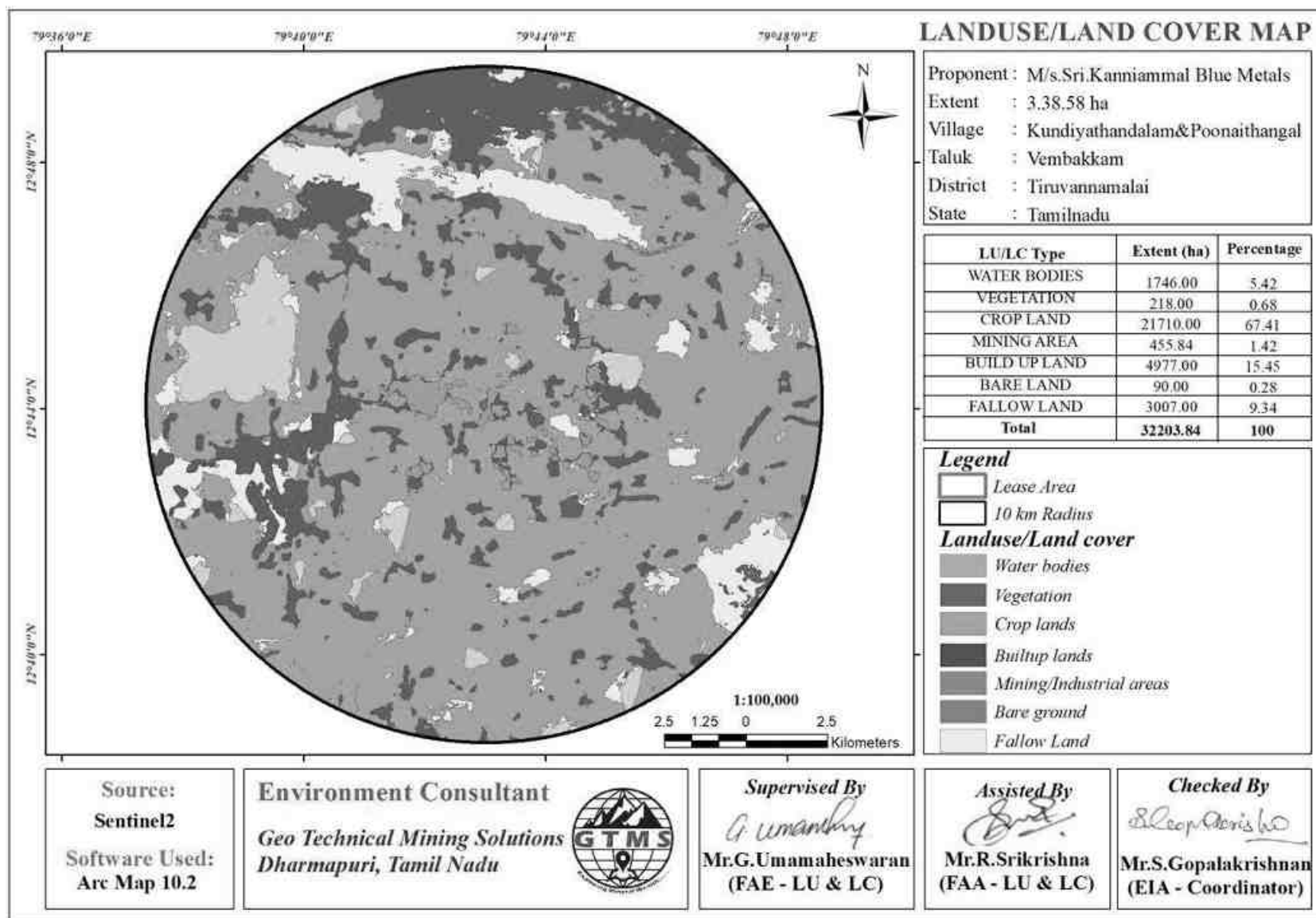


Figure 3.3 LULC Map with 10km Radius around Proposed Project Site (2025)

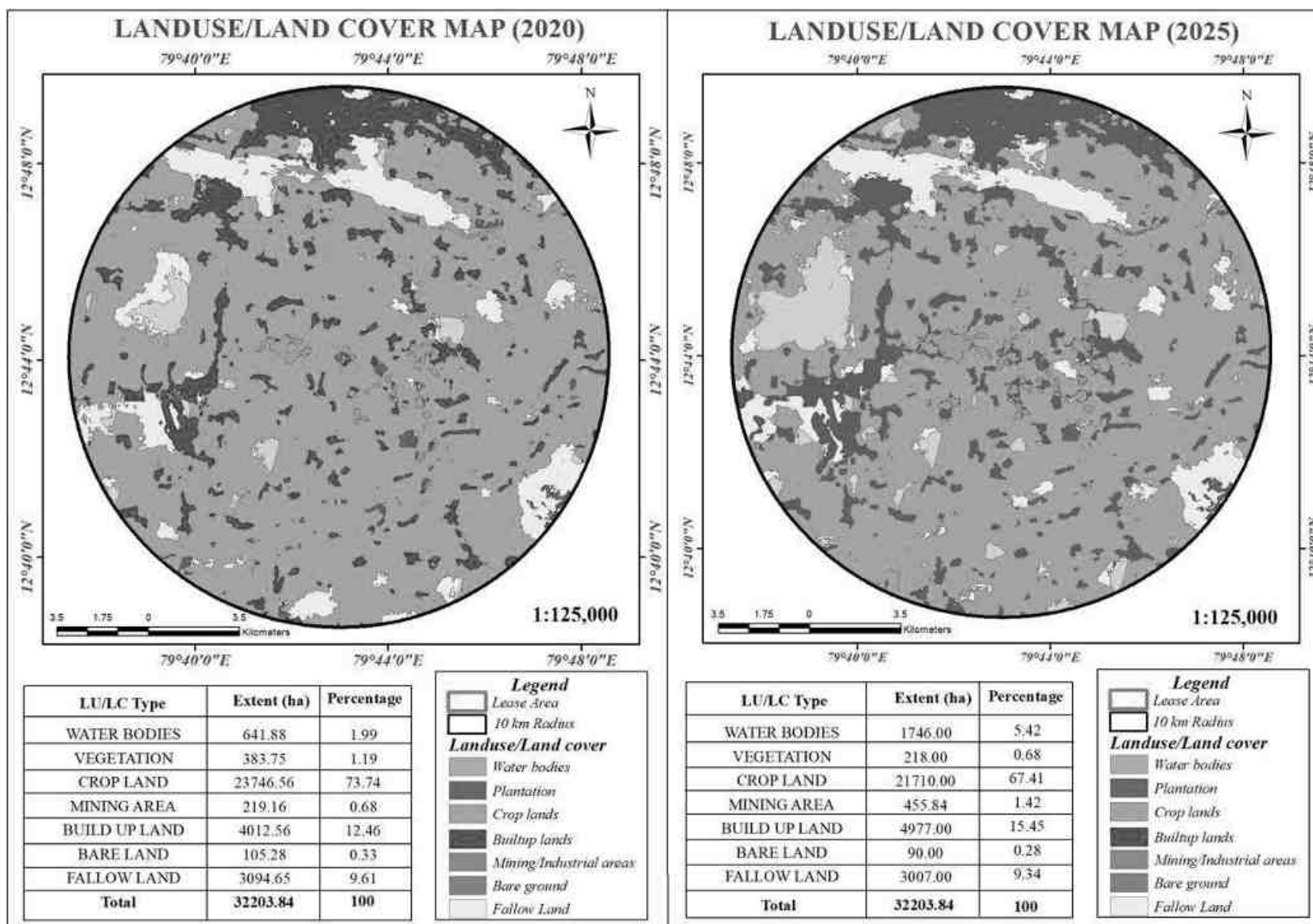


**Figure 3.3a Comparison Map of LULC with 10km Radius around Proposed Project Site (2020 & 2025)**

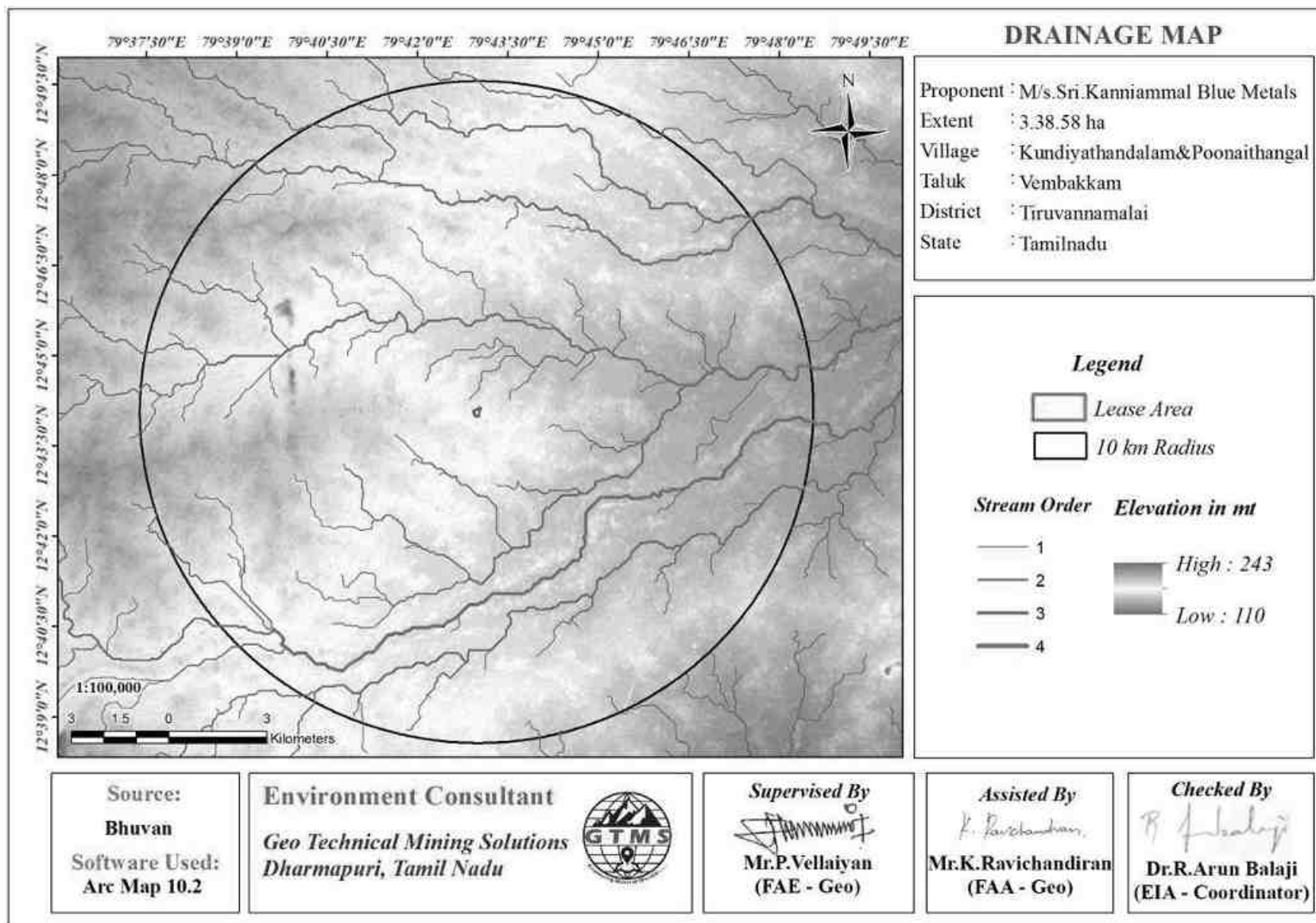


**Figure 3.4 Drainage Map with 10km Radius around Proposed Project Site**

### 3.1.5 Seismic Sensitivity

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

### 3.1.6 Soil

Composite soil samples were collected from 5 locations of the study area to determine the baseline soil characteristics of the soil. The locations were selected for soil sampling based on soil types, vegetative cover, and industrial & residential activities including infrastructure facilities. Soil samples were collected up to 90 cm depth, filled in polythene bags, coded and sent to laboratory for analysis. The locations of the sampling sites are shown in Table 3.3 and Figure 3.5. The samples thus collected were analysed for physical and chemical characteristics. The physical and chemical characteristic results of soil samples are provided in Table 3.3.

**Table 3.3 Soil Sampling Locations**

| Location Id | Monitoring Locations | Distance in m | Direction | Coordinates   |               |
|-------------|----------------------|---------------|-----------|---------------|---------------|
|             |                      |               |           | Latitude      | Longitude     |
| S1          | Near Core            | 0.16          | SW        | 12°43'59.50"N | 79°42'53.03"E |
| S2          | Sodiyambakkam        | 2.16          | SW        | 12°43'35.51"N | 79°41'49.21"E |
| S3          | Vadakalpakkam        | 2.06          | NW        | 12°45'11.98"N | 79°42'48.36"E |
| S4          | Surutal              | 0.41          | NE        | 12°44'20.03"N | 79°44'1.98"E  |
| S5          | Mamandur             | 4.43          | NW        | 12°45'10.43"N | 79°40'44.65"E |

Source: On-site monitoring/sampling *Interstellar Testing Centre Pvt. Ltd.*, in association with GTMS.

The interpretation of the analytical results for the five soil samples (S1–S5) is as follows

| Parameter      | Result Range   | Interpretation                                                 |
|----------------|----------------|----------------------------------------------------------------|
| Organic Matter | 0.25 – 0.36%   | Critically Low. It requires heavy composting.                  |
| Nitrogen (N)   | 0.056 – 0.068% | Deficient and requires fertilization.                          |
| CEC            | 19.30 – 22.50  | Moderate/High shows good nutrient retention potential.         |
| pH             | 7.35 – 8.53    | Neutral to Alkaline except S4. S4 may need sulfur to lower pH. |
| Texture        | Sandy Loam     | Well-aerated but dries out quickly.                            |

These are hungry soils. They have a solid physical foundation and a good capacity to store nutrients (CEC) but they currently contain almost no organic fuel or essential nutrients (N-P-K). Significant application of organic manure and balanced N-P-K fertilizers is essential for any agricultural use.

The Total Organic Matter (TOM) and Total Organic Carbon (TOC) in soil samples indicates a critically depleted state that significantly limits agricultural productivity.

| Sample | TOC (%) | TOM (%) | Rating   |
|--------|---------|---------|----------|
| S1     | 0.16    | 0.276   | Very Low |
| S2     | 0.17    | 0.293   | Very Low |
| S3     | 0.19    | 0.327   | Very Low |
| S4     | 0.15    | 0.258   | Very Low |
| S5     | 0.21    | 0.362   | Very Low |

Productive agricultural topsoil typically contains 1–6% organic matter. Even the maximum observed value in Sample S5 (0.362%) remains significantly below the minimum threshold required for healthy soil biological activity, nutrient cycling, and structural stability.

The organic matter values follow the **Van Bemmelen conversion factor**, where:

$$\text{TOM} \approx \text{TOC} \times 1.724$$

This calculation assumes that soil organic matter consists of approximately 58% organic carbon, which is a widely accepted standard in soil science.

### Agricultural Suitability Evaluation

Due to the dominant sandy loam texture, low organic matter content, and favorable drainage characteristics, the soil is more suitable for horticultural crops than for conventional wet-paddy cultivation.

| Feature              | Paddy Suitability                             | Horticulture Suitability                          |
|----------------------|-----------------------------------------------|---------------------------------------------------|
| Texture (Sandy Loam) | Low (Poor water retention)                    | High (Good drainage and aeration)                 |
| pH (7.35 – 8.53)     | Moderate (Paddy prefers acidic 5.5–6.5)       | High (Suitable for citrus, pomegranate, guava)    |
| Organic Matter       | Critically Low (Requires heavy organic input) | Low (Manageable with regular compost application) |
| Nutrients (NPK)      | Deficient (Requires heavy fertilization)      | Deficient (Requires balanced nutrient management) |

### Stress Relaxation Behaviour of Soil

Based on the sandy loam texture, very low organic matter content (<0.36%), and moderate cation exchange capacity (19.3–22.5 meq/100 g), the soil is expected to exhibit rapid initial stress relaxation followed by a relatively high residual stress.

Unlike organic-rich soils, which continue to relax over extended periods due to elastic organic matrices, the present soils show limited long-term stress dissipation capacity.

### Impact of Vehicular Movement on Soil Sample S1

The cumulative stress generated by repeated vehicle movement over soil sample S1 (Sandy Loam) significantly degrades soil quality by increasing the silt fraction and reducing particulate organic matter, which directly affects plant growth and soil functionality.

### Increase in Silt and Particulate Matter

Vehicle-induced stress physically alters soil texture through particle crushing and aggregate fragmentation:

- High dynamic stress from vehicle tires, concentrated within the top 0–20 cm soil layer, acts as a mechanical milling force.
- Larger sand grains ( $\approx 64.5\%$  in S1) and coarse particles collide and fracture under repeated pressure.
- This process shifts the grain-size distribution toward finer silt-sized particles.
- Surface-accumulated silt is easily resuspended by moving vehicles, increasing  $PM_{10}$  emissions and reducing available topsoil nutrients.

### Impact on Plant Growth

The gradual transformation toward a denser and silt-rich soil structure creates unfavorable growth conditions:

- Increasing silt content fills remaining macropores, rapidly increasing bulk density ( $\approx 1.0\text{--}1.08\text{ g/cc}$ ).
- Higher soil strength restricts root elongation, leading to root impedance and shallow root systems.
- Fine pore dominance reduces aeration and drainage, causing oxygen deficiency (hypoxia) in the root zone.
- In soil sample S1, reduced aeration can decrease root respiration and potentially cause a 12–41% reduction in crop yield, depending on crop sensitivity.

### Preventive Measures for Soil Protection

To minimize siltation and compaction effects:

- **Surface contact pressure should be maintained below 150 kPa**
- Vehicle movement should be avoided when soil moisture is high (7–12%), as wet soil conditions act as a lubricant
- Moist soils accelerate particle breakdown and promote deep-seated compaction

#### Summary of Vehicular Stress Effects on Soil Sample S1

| Soil Component | Change Due to Stress                        | Effect on Plant Growth            |
|----------------|---------------------------------------------|-----------------------------------|
| Silt Content   | Increases due to grain crushing             | Restricts root penetration        |
| Bulk Density   | Increases rapidly                           | Reduces air and water movement    |
| Organic Matter | Fragmentation and accelerated decomposition | Loss of nutrient-holding capacity |
| Pore Structure | Loss of macropores                          | Causes root hypoxia               |

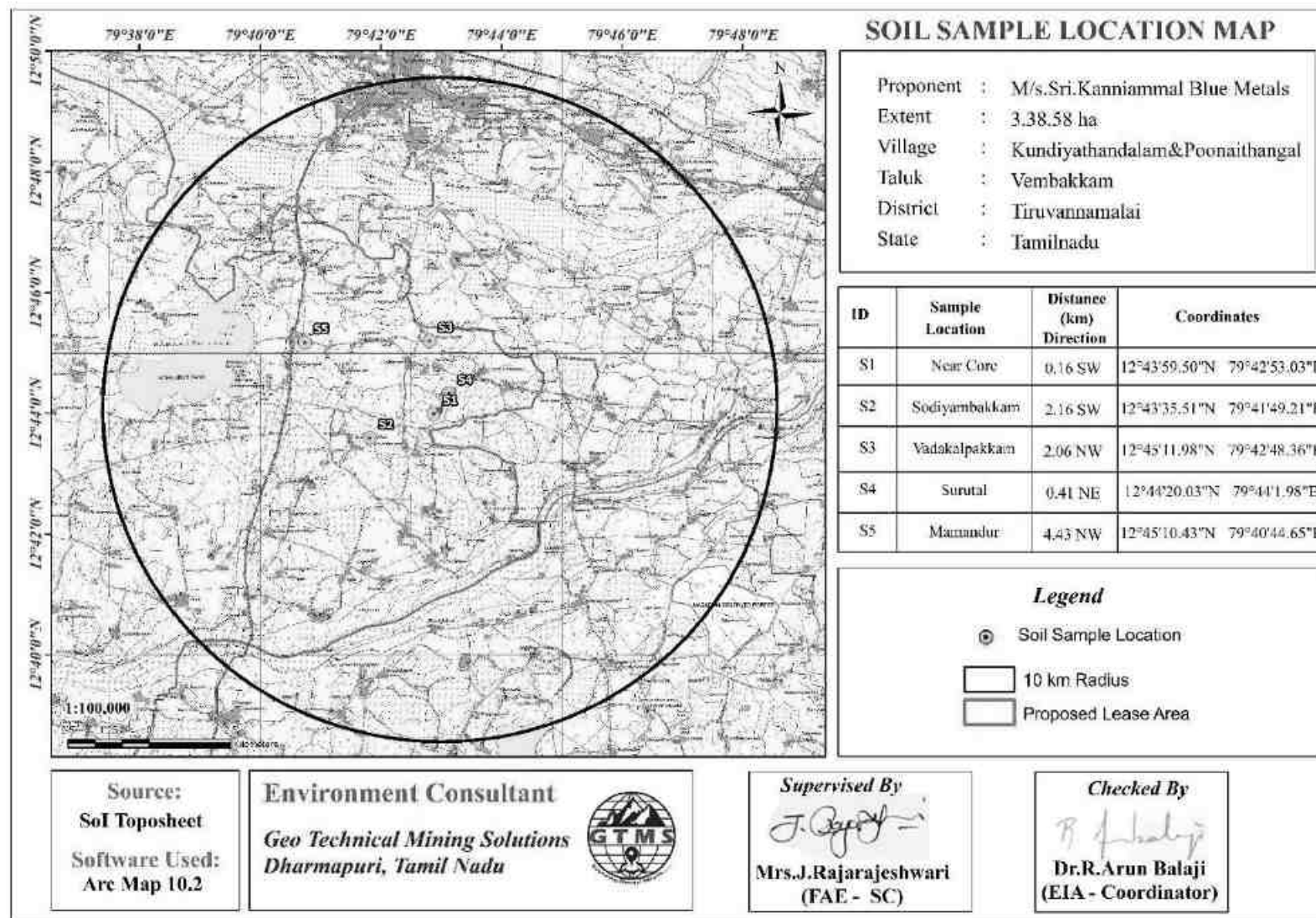


**Figure 3.5 Map Showing Soil Sampling Locations within 10km Radius around Proposed Project Site**

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

| S. No | Parameters                                    | Unit        | Results                          |                            |                                  |                            |                            |
|-------|-----------------------------------------------|-------------|----------------------------------|----------------------------|----------------------------------|----------------------------|----------------------------|
|       |                                               |             | S1                               | S2                         | S3                               | S4                         | S5                         |
| 1     | Description                                   | --          | Light brown coloured Soil sample | Brown coloured soil sample | Light brown coloured Soil sample | Brown coloured soil sample | Brown coloured soil sample |
| 2     | Total Organic Matter                          | %           | 0.276                            | 0.293                      | 0.327                            | 0.258                      | 0.362                      |
| 3     | pH Value                                      | NA          | 7.93                             | 8.12                       | 7.35                             | 8.53                       | 8.17                       |
| 4     | Total Nitrogen (as N)                         | %           | 0.062                            | 0.058                      | 0.056                            | 0.058                      | 0.068                      |
| 5     | Potassium (as K)                              | %           | 0.0108                           | 0.0099                     | 0.0103                           | 0.0112                     | 0.0101                     |
| 6     | Total Phosphate (as P)                        | %           | 0.0031                           | 0.0025                     | 0.0029                           | 0.0018                     | 0.0021                     |
| 7     | Total Soluble Sulphate (as SO <sub>4</sub> ), | %           | 0.0071                           | 0.0083                     | 0.0091                           | 0.0077                     | 0.0072                     |
| 8     | Chloride (as Cl)                              | %           | 0.0032                           | 0.0023                     | 0.0026                           | 0.0027                     | 0.0031                     |
| 9     | Total Organic Carbon                          | %           | 0.16                             | 0.17                       | 0.19                             | 0.15                       | 0.21                       |
| 10    | Cation Exchange Capacity                      | (meq/100g)  | 19.30                            | 22.10                      | 20.30                            | 22.50                      | 21.60                      |
| 11    | Grain size: Sand,                             | % by Weight | 64.5                             | 71.3                       | 68.5                             | 63.5                       | 65.1                       |
| 12    | Silt,                                         |             | 19.3                             | 16.2                       | 15.7                             | 19.6                       | 20.3                       |
| 13    | Clay                                          |             | 16.2                             | 12.5                       | 15.8                             | 16.9                       | 14.6                       |
| 14    | Textural Class                                | --          | Sandy Loam                       | Sandy clay Loam            | Sandy Loam                       | Sandy Loam                 | Sandy Loam                 |
| 15    | Bulk Density                                  | g/cc        | 0.997                            | 1.083                      | 0.999                            | 1.086                      | 1.084                      |
| 16    | Electrical Conductivity                       | (ms/m)      | 0.315                            | 0.214                      | 0.362                            | 0.205                      | 0.210                      |
| 17    | Moisture content                              | %           | 8.3                              | 10.3                       | 7.6                              | 12.3                       | 11.6                       |
| 18    | Calcium as Ca                                 | mg/kg       | 1632                             | 853                        | 1538                             | 1247                       | 1381                       |
| 19    | Maginesum as Mg                               | mg/kg       | 812                              | 312                        | 916                              | 536                        | 617                        |

Source: On-site monitoring/Sampling Results by *Interstellar Testing Centre Pvt. Ltd* in association with *GTMS*.



## 3.2 WATER ENVIRONMENT

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

**Table 3.5 Water Sampling Locations**

| Sampling ID | Location          | Distance (km) | Direction | Coordinates   |               |
|-------------|-------------------|---------------|-----------|---------------|---------------|
|             |                   |               |           | Latitude      | Longitude     |
| SW1         | Palar River       | 6.33          | NNW       | 12°47'31.56"N | 79°42'52.26"E |
| SW2         | Poonathangal Tank | 0.34          | NW        | 12°44'14.87"N | 79°42'53.53"E |
| OW1         | Nearby Suruttal   | 1.12          | NEE       | 12°44'7.12"N  | 79°43'38.12"E |
| BW1         | Menallur          | 1.42          | NW        | 12°44'39.36"N | 79°42'24.96"E |
| Wast Water  | Vadakalpakkam     | 2.15          | NWW       | 12°44'12.03"N | 79°41'44.48"E |

*Source: On-site monitoring/sampling Interstellar Testing Centre Pvt. Ltd, in association with GTMS.*

### 3.2.1 Ground and Surface Water Quality – Resources & Results

The water quality assessment was carried out based on the analytical results presented in Table 3.6 and evaluated with reference to **IS 10500:2012 (Drinking Water Standards)** and **IS 11624:2019 (Indian Standard for Irrigation Water)**. The samples include surface water (SW1 – Palar River, SW2 – Poonathangal Tank), open well water (OW1), bore well water (BW1) and wastewater (WW).

Overall, **groundwater samples (OW1 and BW1)** exhibit comparatively better and more stable quality than the **surface water samples (SW1 and SW2)**, while the wastewater sample (WW) shows slightly higher turbidity and dissolved solids but remains within permissible limits for irrigation use.

#### General Water Quality Interpretation

- **Safety Rating:** All samples comply with the **permissible limits of IS 10500:2012** for drinking water, except for marginal exceedances in turbidity, total hardness and iron in surface water samples.
- **pH:** The pH values range from **6.53 to 7.37**, indicating **neutral to slightly alkaline nature**, well within the acceptable range (6.5–8.5). This pH is suitable for drinking, domestic use and irrigation.
- **TDS & Taste:** TDS values range from **486 to 718 mg/L**. Surface water (SW2) and wastewater (WW) slightly exceed the acceptable limit of 500 mg/L but remain well below

the permissible limit of 2000 mg/L. Such levels may impart a mildly mineralized taste but do not pose health risks.

- Hardness: Total hardness varies from 171 to 241 mg/L, classifying the water as moderately hard to hard. SW2 and OW1 marginally exceed the acceptable limit of 200 mg/L but remain far below the permissible limit of 600 mg/L.

- Health Perspective: Calcium and magnesium concentrations are within safe limits and contribute essential minerals without causing excessive scaling or health issues.

#### Interpretation of Water Quality Results (Based on IS 10500:2012)

| Parameter               | Observed Range (All Samples) | Acceptable Limit | Permissible Limit* | Status & Interpretation                                           |
|-------------------------|------------------------------|------------------|--------------------|-------------------------------------------------------------------|
| pH @ 25°C               | 6.53 – 7.37                  | 6.5 – 8.5        | No relaxation      | Safe – All samples within ideal range                             |
| Turbidity (NTU)         | 0.7 – 2.1                    | 1.0              | 5.0                | Exceeds acceptable in SW2 & WW; may indicate suspended matter     |
| Colour (Hazen)          | 5 – 10                       | 5                | 15                 | Marginal exceedance in OW1 & WW; aesthetic concern only           |
| TDS (mg/L)              | 486 – 718                    | 500              | 2000               | Exceeds acceptable in SW2, OW1 & WW; safe under permissible limit |
| Calcium (as Ca) (mg/L)  | 58.8 – 85.0                  | 75               | 200                | Slight exceedance in SW2 & OW1; contributes to hardness           |
| Total Hardness (mg/L)   | 171 – 241                    | 200              | 600                | Exceeds acceptable in SW2 & OW1; classified as hard water         |
| Chloride (mg/L)         | 136 – 215                    | 250              | 1000               | Safe in all samples                                               |
| Fluoride (mg/L)         | 0.16 – 0.51                  | 1.0              | 1.5                | Safe – Ideal range                                                |
| Nitrate (mg/L)          | 6.7 – 12.3                   | 45               | No relaxation      | Safe – No health risk                                             |
| Iron (mg/L)             | 0.11 – 0.36                  | 0.3              | No relaxation      | Slight exceedance in SW2; may cause staining                      |
| Total Coliform / E.coli | Absent                       | Absent           | Absent             | Satisfactory – No fecal contamination                             |

\*Permissible limit applies in the absence of an alternate source.

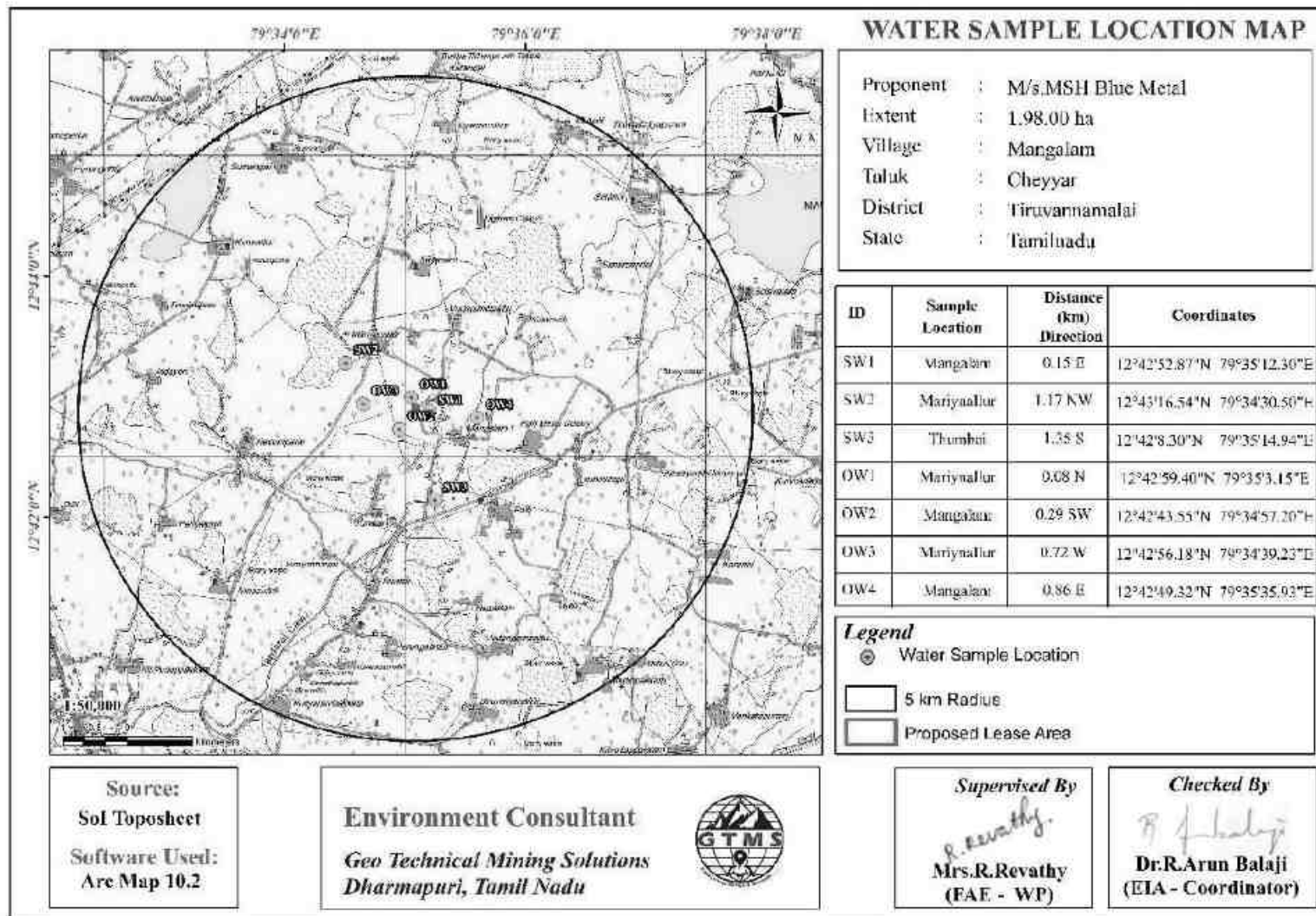


Figure 3.6 Map Showing Water Sampling Locations within 10km Radius around Proposed Project Site

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

| S. No. | Parameters                                         | Units      | Results           |                   |                   |                   |                        |
|--------|----------------------------------------------------|------------|-------------------|-------------------|-------------------|-------------------|------------------------|
|        |                                                    |            | SW1               | SW2               | OW1               | BW1               | WW                     |
| 1      | Location                                           | -          | Palar River       | Poonathangal tank | Nearby Suruttal   | Menallur          | Vadakalpakkam          |
| 2      | Order No.                                          | -          | SR02EN-2601020031 | SR02EN-2601020032 | SR02EN-2601020033 | SR02EN-2601020034 | SR02EN-2601020035      |
| 3      | Sample Description                                 | -          | Clear liquid      | Clear liquid      | Clear liquid      | Clear liquid      | Slightly Turbid Liquid |
| 4      | Ammonia as NH <sub>3</sub>                         | mg /l      | BLQ(LOQ:0.1)      | BLQ(LOQ:0.1)      | BLQ(LOQ:0.1)      | BLQ(LOQ:0.1)      | BLQ(LOQ:0.1)           |
| 5      | Carbonate Hardness (as CaCO <sub>3</sub> )         | mg /l      | 157               | 163               | 141               | 147               | 160                    |
| 6      | Phenolphthalein Alkalinity (as CaCO <sub>3</sub> ) | mg /l      | BLQ(LOQ:1.0)      | BLQ(LOQ:1.0)      | BLQ(LOQ:1.0)      | BLQ(LOQ:1.0)      | BLQ(LOQ:1.0)           |
| 7      | Non-Carbonate Hardness (as CaCO <sub>3</sub> )     | mg/l       | 32                | 51                | 104               | 22                | 41                     |
| 8      | EC                                                 | µmhos/cm   | 850               | 1053              | 1213              | 926               | 1153                   |
| 9      | PO <sub>4</sub>                                    | mg/l       | BLQ(LOQ:0.05)     | BLQ(LOQ:0.05)     | BLQ(LOQ:0.05)     | BLQ(LOQ:0.05)     | BLQ(LOQ:0.05)          |
| 10     | Appearance                                         | -          | Colourless liquid | Colourless liquid | Clear liquid      | Colourless liquid | Slightly Turbid Liquid |
| 11     | Sio <sub>2</sub>                                   | mg/l       | 10.30             | 8.60              | 9.30              | 7.35              | 6.10                   |
| 12     | Odour                                              | -          | Agreeable         | Agreeable         | Agreeable         | Agreeable         | Agreeable              |
| 13     | pH                                                 | -          | 6.64              | 6.53              | 7.16              | 7.25              | 7.37                   |
| 14     | Colour                                             | Hazen      | 5                 | 5                 | 10                | 5                 | 10                     |
| 15     | Taste                                              | -          | Agreeable         | Agreeable         | Agreeable         | Agreeable         | Agreeable              |
| 16     | Turbidity                                          | NTU        | 0.7               | 1.5               | 1.1               | 0.9               | 2.1                    |
| 17     | TDS                                                | mg/l       | 486               | 611               | 718               | 537               | 638                    |
| 18     | Ca                                                 | mg/l       | 58.8              | 75.2              | 85.0              | 62.1              | 67.1                   |
| 19     | Fe                                                 | mg/l       | 0.12              | 0.36              | 0.11              | 0.19              | 0.23                   |
| 20     | Mg                                                 | mg/l       | 9.9               | 5.9               | 6.9               | 3.9               | 7.9                    |
| 21     | Cl                                                 | mg/l       | 142.0             | 173.0             | 215.0             | 136.0             | 173.0                  |
| 22     | So <sub>4</sub>                                    | mg/l       | 31.6              | 23.5              | 27.6              | 30.8              | 38.9                   |
| 23     | RFC                                                | mg/l       | BLQ(LOQ:0.1)      | BLQ(LOQ:0.1)      | BLQ(LOQ:0.1)      | BLQ(LOQ:0.1)      | BLQ(LOQ:0.1)           |
| 24     | Flouride                                           | mg/l       | 0.31              | 0.4               | 0.23              | 0.16              | 0.51                   |
| 25     | No <sub>3</sub>                                    | mg/l       | 12.30             | 10.60             | 8.60              | 11.50             | 6.70                   |
| 26     | TA                                                 | mg/l       | 156               | 161               | 137               | 149               | 159                    |
| 27     | TH                                                 | mg/l       | 188               | 212               | 241               | 171               | 200                    |
| 28     | BOD                                                | mg/l       | BLQ(LOQ: 1.0)     | BLQ(LOQ: 1.0)     | BLQ(LOQ: 1.0)     | BLQ(LOQ: 1.0)     | BLQ(LOQ: 1.0)          |
| 29     | COD                                                | mg/l       | 20                | 15                | BLQ(LOQ: 5.0)     | BLQ(LOQ: 5.0)     | 20                     |
| 30     | Dissolved Oxygen                                   | mg/l       | 6.3               | 6.2               | 6                 | 6.1               | 6.2                    |
| 31     | Total Coliform                                     | MPN/100 ml | Absent            | Absent            | Absent            | Absent            | Absent                 |
| 32     | Escherichia Coli                                   | MPN/100 ml | Absent            | Absent            | Absent            | Absent            | Absent                 |

Source: Sampling Results by Interstellar Testing Centre Pvt. Ltd in association with GTMS.

### Irrigation Water Suitability (IS 11624:2019)

- **Electrical Conductivity (EC):** EC values range from **850 to 1213  $\mu\text{mhos/cm}$** , placing the water in **medium salinity class**. This category is suitable for most crops with normal soil management practices.
- **Specific Ions:** Chloride, sulphate and nitrate concentrations are low and pose **no risk of leaf burn**, even under sprinkler irrigation.
- **Organic Pollution:** BOD values are below detection limits in all samples, indicating **no organic contamination**.

### Paddy & Crop Suitability Assessment

| Parameter                  | SW / GW Range | Recommended Limit (Paddy) | Suitability   |
|----------------------------|---------------|---------------------------|---------------|
| EC ( $\mu\text{mhos/cm}$ ) | 850 – 1213    | <1500                     | Excellent     |
| TDS (mg/L)                 | 486 – 718     | <600 (Ideal)              | Good to Ideal |
| pH                         | 6.53 – 7.37   | 6.5 – 8.4                 | Normal        |
| Iron (mg/L)                | $\leq 0.36$   | <5.0                      | Highly Safe   |
| Fluoride (mg/L)            | $\leq 0.51$   | <1.0                      | Safe          |
| Calcium & Magnesium        | Moderate      | Balanced                  | Healthy       |

### 3.2.2 Hydrogeological Studies

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

#### ***Rainfall***

Rainfall data for the study area were collected for the period of 2004-2024([POWER | Data Access Viewer \(nasa.gov\)](#)). Long term monthly average rainfall was estimated from the data of 2004-2024 and compared with the monthly rainfall for the year 2024, shown in Figure 3.7. The Figure 3.7 shows that rainfall is generally high in the months of September through November in every year. Particularly, rainfall in July through August and October, December of 2022 is higher than the previous years.

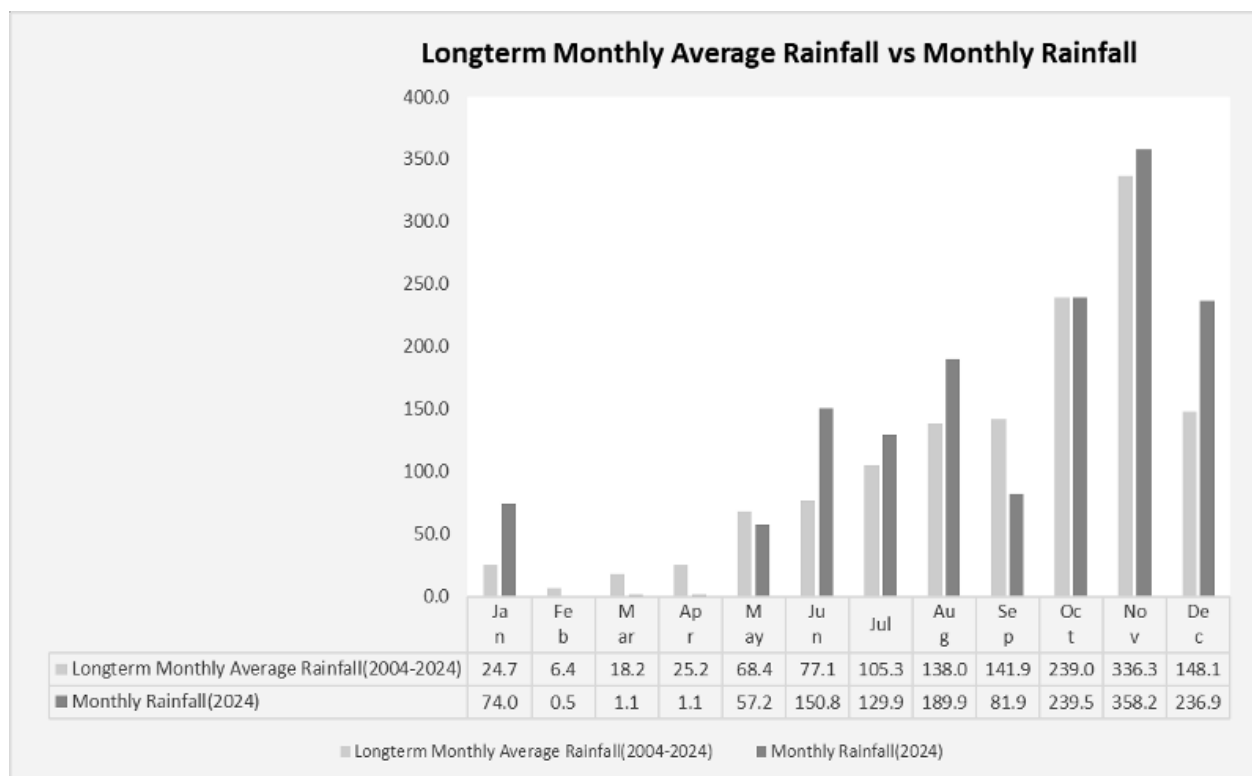


**Figure 3.7 Long-Term Monthly Average Rainfall Vs Monthly Rainfall**

### 3.2.3.1 Groundwater Levels and Flow Direction

Data regarding depth to groundwater levels are essential to infer the direction of groundwater movement within the study area. Knowledge of groundwater flow direction is must in choosing location for background groundwater quality monitoring well and in locating recharge and discharge areas. Therefore, data regarding groundwater elevations were collected from 8 open wells and 8 bore wells at various locations within 2 km radius around the proposed project sites for the period from March through May 2025 (Pre-Monsoon Season) and from October through December 2025, (Post Monsoon Season).

#### Groundwater Levels data 2025 Data

- Open Wells:
  - Pre-Monsoon (March–May): 10.97 to 13.90m BGL
  - Post-Monsoon (October–December): 10.8 to 13.5m BGL
- Bore Wells:
  - Pre-Monsoon (March–May): 52.6 to 56.8 m BGL.
  - Post-Monsoon (October–December): 52.8 to 57.4 m BGL.

#### Groundwater Flow Direction

- **Open Wells:** Groundwater generally flows towards the **South** (Open Well 5) and the **East** (Open Well 2) relative to the proposed project site.

- **Bore Wells:** Groundwater flows towards the **Northeast** (Bore Well 8) of the project site.

### **Water Management Strategy**

- **Daily Requirement:** Estimated at **3.5 KLD** for drinking, domestic use, green belt maintenance, and dust suppression.
- **Supply:** Drinking water will be outsourced or treated via an onsite RO plant.
- **Harvesting:** A garland drain system will connect excavated pits to collect rainwater. Rooftop harvesting from labor sheds will also be implemented to recharge the aquifer and reduce dependency on local wells.

### **Monitoring Recommendation**

Open wells 2 & 5 and bore well 8 have been identified as primary locations for water quality monitoring because their positions downstream of the flow direction make them most susceptible to potential contaminants from mining activities.

### **Water Balance management & artificial recharge in site**

The following eco-friendly water management plan will be implemented:

#### **1. Water Demand and Supply**

- The total water requirement is 3.5 KLD covering drinking, domestic needs, green belt maintenance and dust suppression.
- To ensure safety drinking water will be sourced from external vendors or processed through an on-site RO plant.

#### **2. Rainwater Harvesting & Storage**

Excavated pits near the site will be interconnected via a garland drain system to capture surface runoff.

Rainwater from labor sheds and permanent structures will be diverted into the excavated pits.

Captured water will be prioritized for non-potable uses such as dust suppression and green belt irrigation to minimize the extraction of local groundwater.

#### **3. Artificial & Natural Recharge**

Harvesting structures are specifically planned for the Northeast section of the site, aligning with the bore well groundwater flow direction.

Soil resistivity data indicates specific porous and permeable zones within the site. These areas will be preserved to facilitate natural aquifer recharge during monsoon seasons.

#### 4. Impact Mitigation

By reducing dependency on the 16 monitored wells (8 open, 8 bore) within the 2 km radius this strategy aims to maintain the local water balance and prevent depletion of the static water table which averaged between 10.97m and 54.4m BGL in 2025.

**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-2025                            | Apr-2025 | May- 2025 | Average |               |               |
| OW01       | 12.9                                | 13.4     | 13.7      | 13.33   | 12°44'58.24"N | 79°42'40.84"E |
| OW02       | 10.9                                | 11.3     | 11.7      | 11.30   | 12°44'40.76"N | 79°42'54.11"E |
| OW03       | 13.5                                | 13.9     | 14.3      | 13.90   | 12°43'53.59"N | 79°42'0.46"E  |
| OW04       | 11.8                                | 12.3     | 12.7      | 12.27   | 12°44'16.37"N | 79°43'56.73"E |
| OW05       | 10.5                                | 10.9     | 11.5      | 10.97   | 12°44'13.24"N | 79°42'35.98"E |
| OW06       | 12.4                                | 12.7     | 13.2      | 12.77   | 12°43'21.02"N | 79°42'43.27"E |
| OW07       | 11.4                                | 11.6     | 11.9      | 11.63   | 12°44'16.78"N | 79°43'22.89"E |
| OW08       | 11.8                                | 12.3     | 12.7      | 12.27   | 12°43'37.78"N | 79°43'45.05"E |

**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-2025                           | Nov- 2025 | Dec-2025 | Average |               |               |
| OW01       | 13.6                               | 13.2      | 12.5     | 13.1    | 12°44'58.24"N | 79°42'40.84"E |
| OW02       | 11.7                               | 11.4      | 10.8     | 11.3    | 12°44'40.76"N | 79°42'54.11"E |
| OW03       | 14.2                               | 13.7      | 12.6     | 13.5    | 12°43'53.59"N | 79°42'0.46"E  |
| OW04       | 12.6                               | 12.1      | 11.6     | 12.1    | 12°44'16.37"N | 79°43'56.73"E |
| OW05       | 11.3                               | 10.9      | 10.1     | 10.8    | 12°44'13.24"N | 79°42'35.98"E |
| OW06       | 13.1                               | 12.8      | 11.7     | 12.5    | 12°43'21.02"N | 79°42'43.27"E |
| OW07       | 11.5                               | 11.2      | 10.5     | 11.1    | 12°44'16.78"N | 79°43'22.89"E |
| OW08       | 12.6                               | 12.4      | 11.9     | 12.3    | 12°43'37.78"N | 79°43'45.05"E |

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

| Station ID | Depth to Static Potentiometric Surface BGL(m) |          |           |         | Latitude      | Longitude     |
|------------|-----------------------------------------------|----------|-----------|---------|---------------|---------------|
|            | Mar-2025                                      | Apr-2025 | May- 2025 | Average |               |               |
| BW01       | 54.9                                          | 55.3     | 55.8      | 55.3    | 12°43'20.32"N | 79°42'34.21"E |
| BW02       | 53.4                                          | 53.7     | 54.1      | 53.7    | 12°44'46.82"N | 79°42'28.21"E |
| BW03       | 52.8                                          | 53.2     | 53.9      | 53.3    | 12°44'42.61"N | 79°43'41.38"E |
| BW04       | 56.2                                          | 56.8     | 57.4      | 56.8    | 12°43'29.18"N | 79°43'25.23"E |
| BW05       | 54.2                                          | 54.8     | 55.3      | 54.8    | 12°44'22.24"N | 79°44'2.80"E  |



|      |      |      |      |      |              |               |
|------|------|------|------|------|--------------|---------------|
| BW06 | 55.6 | 55.8 | 56.3 | 55.9 | 12°44'7.88"N | 79°42'17.72"E |
| BW07 | 53.4 | 53.9 | 54.4 | 53.9 | 12°44'7.91"N | 79°43'8.66"E  |
| BW08 | 52.3 | 52.5 | 53.1 | 52.6 | 12°44'0.07"N | 79°43'40.46"E |

*Source: Onsite monitoring data*

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

| Station ID | Depth to Static Potentiometric Surface BGL(m) |          |          |         | Latitude      | Longitude     |
|------------|-----------------------------------------------|----------|----------|---------|---------------|---------------|
|            | Oct-2025                                      | Nov-2025 | Dec-2025 | Average |               |               |
| BW01       | 55.5                                          | 54.2     | 53.7     | 54.5    | 12°43'20.32"N | 79°42'34.21"E |
| BW02       | 53.9                                          | 53.5     | 52.7     | 53.4    | 12°44'46.82"N | 79°42'28.21"E |
| BW03       | 53.8                                          | 53.4     | 52.8     | 53.3    | 12°44'42.61"N | 79°43'41.38"E |
| BW04       | 57.2                                          | 56.8     | 56.1     | 56.7    | 12°43'29.18"N | 79°43'25.23"E |
| BW05       | 54.9                                          | 54.2     | 53.7     | 54.3    | 12°44'22.24"N | 79°44'2.80"E  |
| BW06       | 55.7                                          | 55.2     | 54.8     | 55.2    | 12°44'7.88"N  | 79°42'17.72"E |
| BW07       | 54.2                                          | 53.9     | 53.2     | 53.8    | 12°44'7.91"N  | 79°43'8.66"E  |
| BW08       | 52.9                                          | 52.1     | 51.4     | 52.1    | 12°44'0.07"N  | 79°43'40.46"E |

*Source: Onsite monitoring data*

According to the data average depth to the static water table in open wells range from 10.97 to 13.90m BGL in pre-monsoon and 10.8 to 13.5m BGL in post monsoon. The bore well data thus collected onsite are provided in Tables 3.9 and 3.10. The average depth to static potentiometric surface in bore wells for the period of October 2025 through December 2025 (Post Monsoon Season) vary from 52.1 to 56.7m and from 52.6 to 56.8 m for the period of March through May, 2025 (Pre-Monsoon Season).

Groundwater flows naturally from areas of high hydraulic head to low hydraulic head a process governed by the hydraulic gradient and influenced by the aquifer's hydraulic conductivity. Groundwater velocity is higher when the hydraulic gradient or hydraulic conductivity is greater. A potentiometric map uses contour lines to represent equipotential hydraulic head and groundwater flow is always perpendicular to these equipotential lines moving from higher to lower head values shown in Figures 3.8-3.9 for open wells and 3.10-3.11 for bore wells.

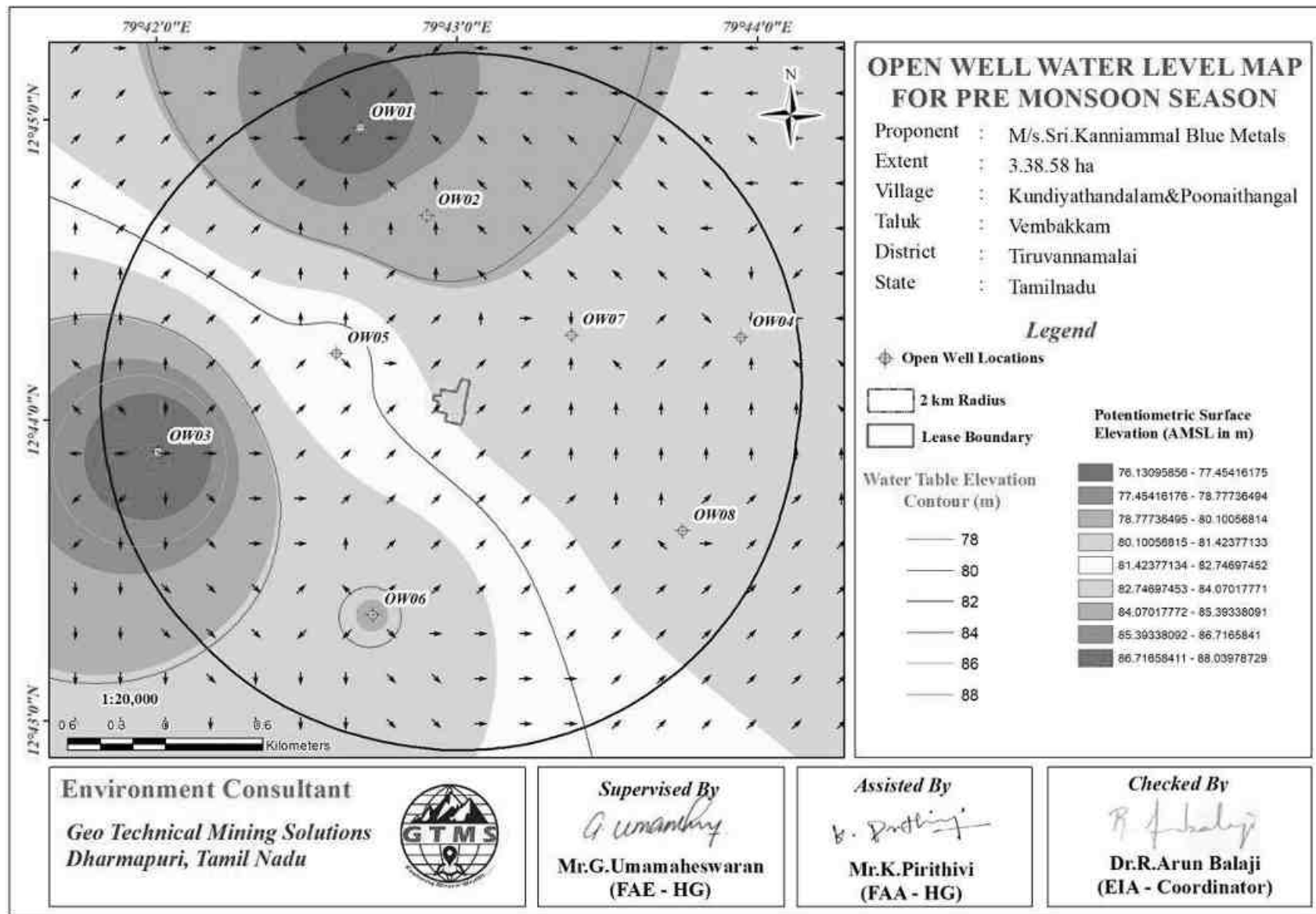


Figure 3.8 Open Well Static Groundwater Elevation Map Showing Direction of Groundwater Flow during Pre-Monsoon Season

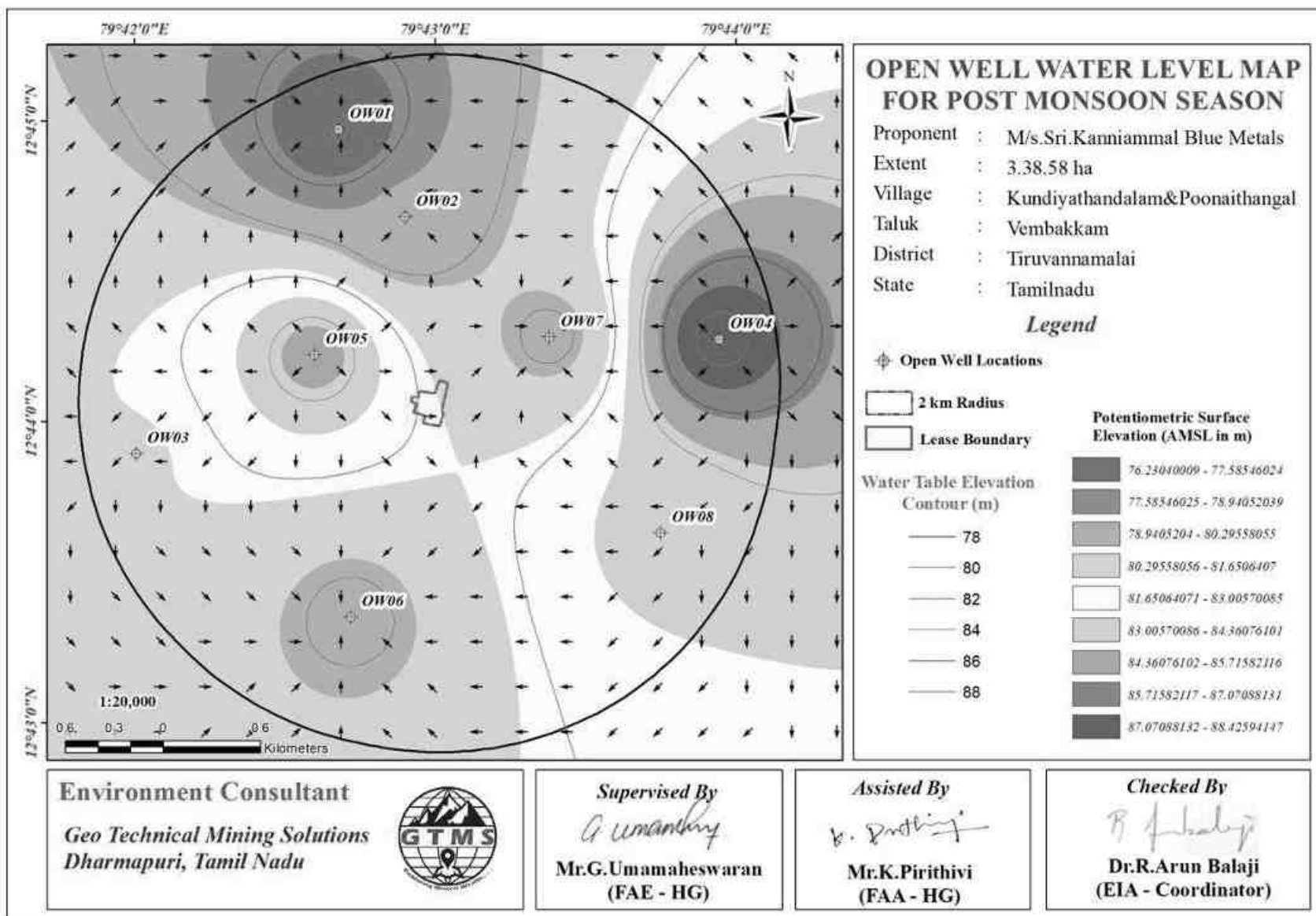


Figure 3.9 Open Well Static Groundwater Elevation Map Showing Direction of Groundwater Flow during Post-Monsoon Season

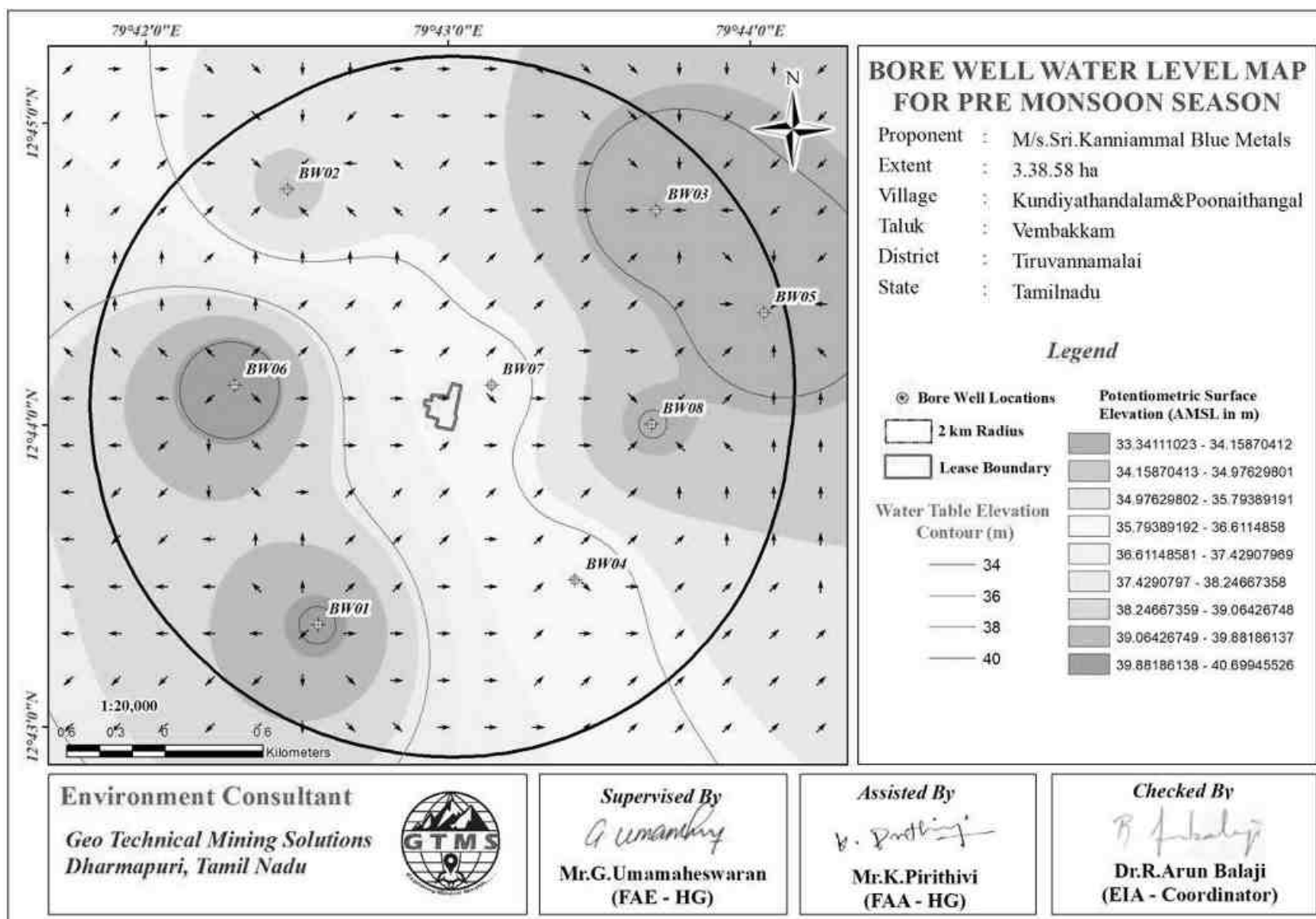


Figure 3.10 Borewell Static Groundwater Elevation Map Showing Direction of Groundwater Flow during Pre-Monsoon Season

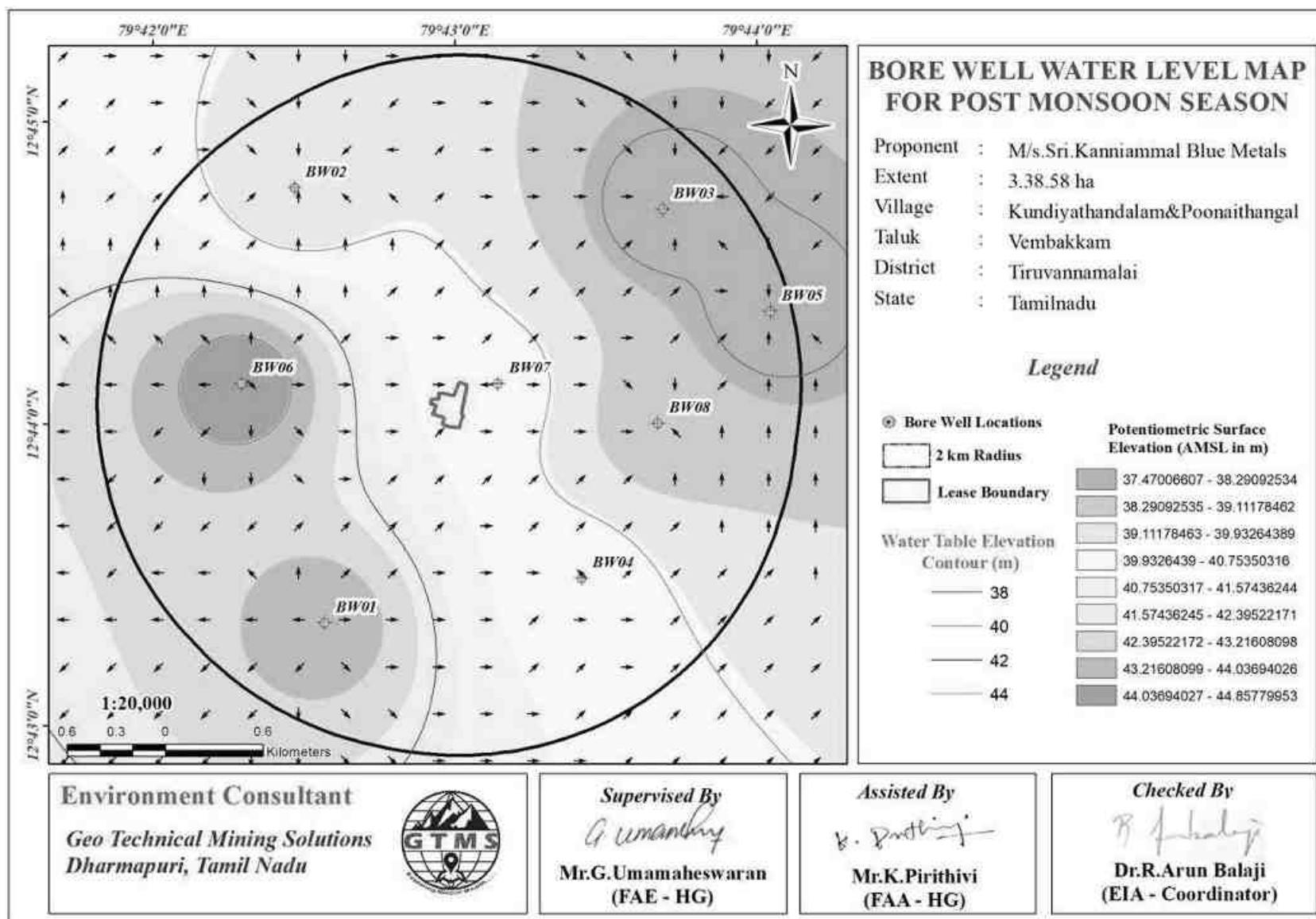


Figure 3.11 Borewell Static Groundwater Elevation Map Showing Direction of Groundwater Flow during Post-Monsoon Season

## Ground Water Table Vs Working Depth

|           |                                  |
|-----------|----------------------------------|
| Proponent | : M/s.Sri.Kanniammal Blue Metals |
| Extent    | : 3.38.58 ha                     |
| Village   | : Kundiyathandalam&Poonathangal  |
| Taluk     | : Vembakkam                      |
| District  | : Tiruvannamalai                 |
| State     | : Tamilnadu                      |

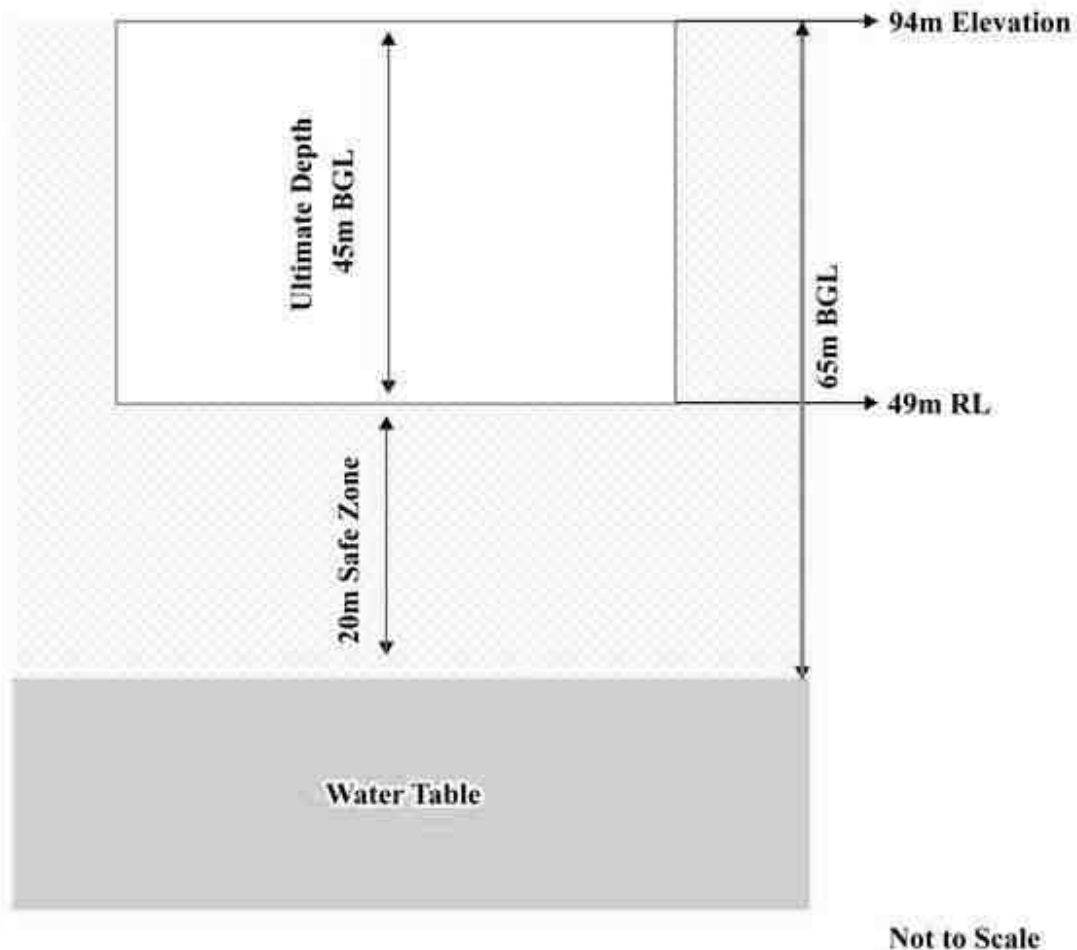


Figure 3.12 Schematic diagram illustrating Ground water table vs Ultimate mining depth

### 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 3.13.

**Table 3.11 Vertical Electrical Sounding Data**

| Location Coordinates - 12°44'3.15"N 79°42'59.58"E |          |          |                        |                        |                                    |
|---------------------------------------------------|----------|----------|------------------------|------------------------|------------------------------------|
| S. No.                                            | AB/2 (m) | MN/2 (m) | Geometrical Factor (G) | Resistance in $\Omega$ | Apparent Resistivity in $\Omega m$ |
| 1                                                 | 5        | 1        | 4.71                   | 33.248                 | 156.60                             |
| 2                                                 | 10       | 1        | 23.57                  | 12.915                 | 304.40                             |
| 3                                                 | 15       | 1        | 55.00                  | 7.542                  | 414.79                             |
| 4                                                 | 20       | 1        | 99.00                  | 5.678                  | 562.15                             |
| 5                                                 | 25       | 2        | 75.43                  | 8.803                  | 664.02                             |
| 6                                                 | 30       | 2        | 110.01                 | 7.422                  | 816.48                             |
| 7                                                 | 35       | 2        | 150.86                 | 6.266                  | 945.32                             |
| 8                                                 | 40       | 2        | 198.01                 | 5.129                  | 1015.68                            |
| 9                                                 | 45       | 2        | 251.44                 | 4.170                  | 1048.56                            |
| 10                                                | 50       | 2        | 311.16                 | 3.638                  | 1132.15                            |
| 11                                                | 60       | 5        | 188.58                 | 5.422                  | 1022.45                            |
| 12                                                | 70       | 5        | 275.01                 | 4.891                  | 1345.18                            |
| 13                                                | 80       | 5        | 377.16                 | 3.745                  | 1412.50                            |
| 14                                                | 90       | 5        | 495.02                 | 2.922                  | 1446.32                            |
| 15                                                | 100      | 5        | 628.60                 | 2.556                  | 1606.52                            |

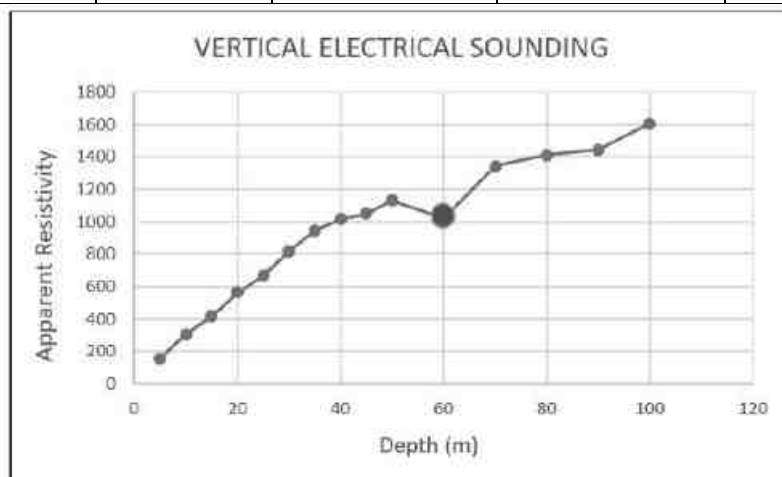


**Figure 3.13 Graph Showing Occurrence of Water Bearing Fracture Zones at the Depth of 60-65m Below Ground Level in Proposed Project**

The rock formation of low resistivity values indicates occurrence of water at the depth of about 65m below ground level. The ultimate depth of proposed project is 45m below ground level. Therefore, the mining operation will not affect the aquifer throughout the entire mine life period.

### 3.3 AIR ENVIRONMENT

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

#### 3.3.1 Meteorology

##### 3.3.1.1 Climatic Variables

A temporary meteorological station was installed at the project sites by covering cluster quarries. The station was installed at a height of 3m 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.

**Table 3.12 Onsite Meteorological Data**

| S. No. | Parameters                    |     | OCT,2025 | NOV,2025 | DEC,2025 |
|--------|-------------------------------|-----|----------|----------|----------|
| 1      | Temperature ( <sup>0</sup> C) | Min | 24.01    | 22.86    | 20.55    |
|        |                               | Max | 32.44    | 31.30    | 29.48    |
|        |                               | Avg | 27.59    | 26.49    | 25.19    |
| 2      | Relative Humidity (%)         | Min | 56.55    | 58.80    | 54.92    |
|        |                               | Max | 94.29    | 94.13    | 96.30    |
|        |                               | Avg | 82.56    | 81.68    | 81.64    |
| 3      | Wind Speed (m/s)              | Min | 0.11     | 0.25     | 1.34     |
|        |                               | Max | 5.97     | 8.91     | 6.34     |
|        |                               | Avg | 2.40     | 3.85     | 3.92     |
| 4      | Wind Direction (degree)       | Min | 1.40     | 0.40     | 0.10     |
|        |                               | Max | 358.30   | 359.50   | 359.60   |
|        |                               | Avg | 159.25   | 87.58    | 70.49    |
| 5      | Surface Pressure(kPa)         | Min | 99.92    | 100.04   | 100.29   |
|        |                               | Max | 100.97   | 101.21   | 101.37   |
|        |                               | Avg | 100.49   | 100.79   | 100.91   |

Source: On-site monitoring/sampling by *Interstellar Testing Centre Pvt. Ltd* in association with GTMS



### Temperature:

2025 is officially categorized as the second or third warmest year on record globally. The first half of 2025 saw record-breaking monthly temperatures especially in January followed by a slight cooling in the latter half as the climate transitioned to La Niña conditions.

- Pre-monsoon (March-May): Average maximum reached ~35-36°C nationwide.
- Monsoon (June-September): Average maximum fluctuated around 31-34°C.
- Post-monsoon (Oct-Dec): Dropped from 20.55°C (Dec) to 32.44°C (Oct) as per your local data.

### Relative Humidity:

Humidity levels remained exceptionally high during the monsoon and post-monsoon seasons frequently reaching 100% as reflected in the Oct–Dec data. Typical of a year with above normal rainfall where annual averages generally range from 60% in dry months to 85%+ in the latter half of the year.

### Rainfall & Winds:

The country received **above-normal rainfall** overall in 2025. 6.1% above normal cumulative rainfall by August's end. Significant excess was noted with October receiving **49% above normal** rainfall. The transition to the Northeast Monsoon in the final quarter saw average speeds of **2.40 to 3.92m/s** with peak gusts up to 8.91m/s in November occurring during the transition period. The measured average wind velocity during the study period is 2.02m/s.

### Surface Pressure (kPa):

Atmospheric pressure typically follows a seasonal "U" curve in India being lowest during the peak of the summer/monsoon (May–August) and rising during the cooler months. The data shows this rise in action moving from **99.92 kPa** (Oct) to **101.37 kPa** (Dec) as the air becomes cooler and denser. A wind direction graph **was generated** using annual average values.

### 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





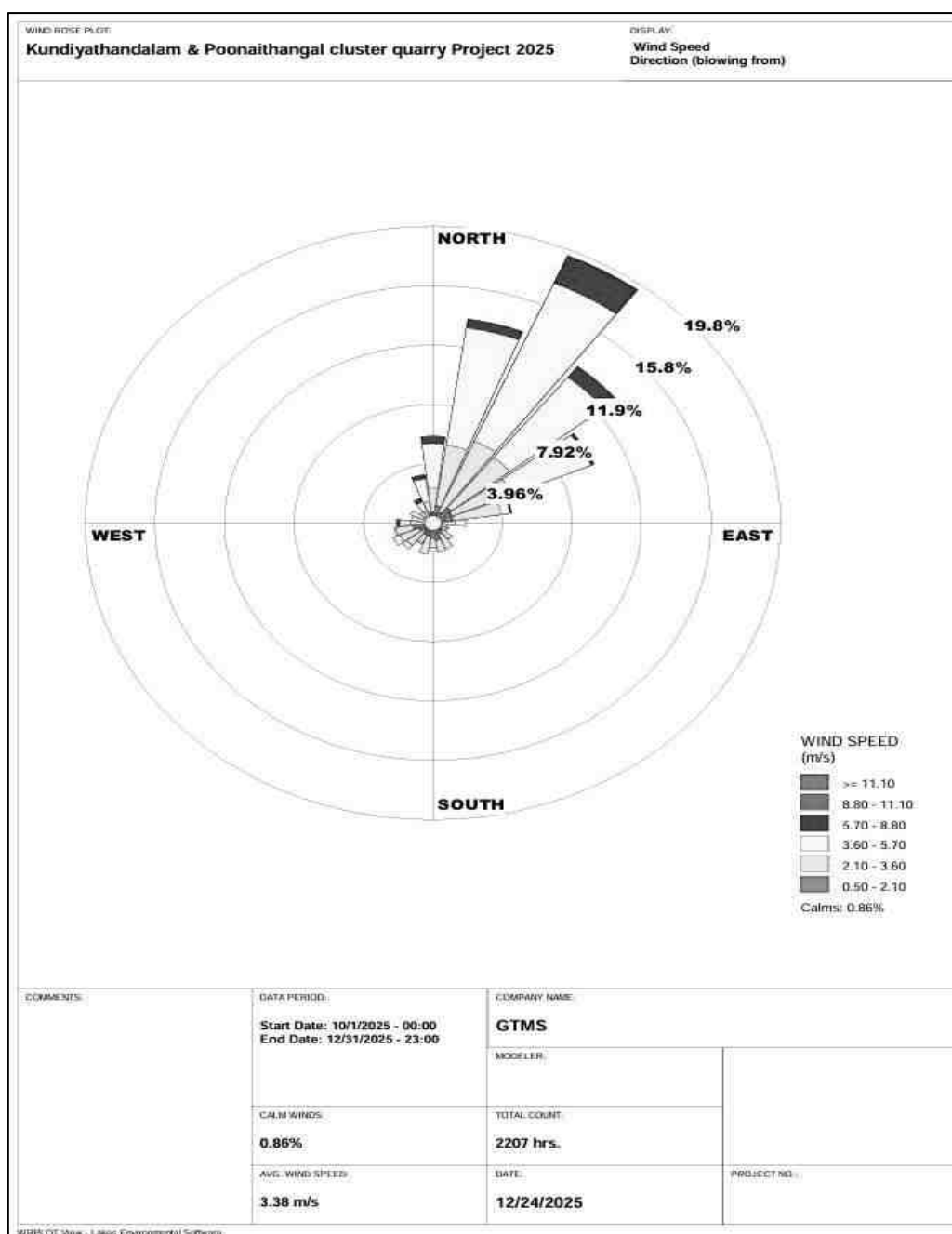


**Figure 3.16 Onsite Wind Rose Diagram**

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

| Parameter         | Method                                                   | Instrument                                      |
|-------------------|----------------------------------------------------------|-------------------------------------------------|
| PM <sub>2.5</sub> | Gravimetric method<br>Beta attenuation method            | Fine Particulate Sampler                        |
| PM <sub>10</sub>  | Gravimetric method<br>Beta attenuation method            | Respirable Dust Sampler                         |
| SO <sub>2</sub>   | IS-5182 Part II<br>(Improved West & Gaeke method)        | Respirable Dust Sampler with gaseous attachment |
| NO <sub>x</sub>   | IS-5182 Part II<br>(Jacob & Hoch heiser modified method) | Respirable Dust Sampler with gaseous attachment |

Source: Sampling Methodology based *Interstellar Testing Centre Pvt. Ltd* & *CPCB* Notification

**Table 3.14 National Ambient Air Quality Standards**

| Pollutant                                 | Time Weighted Average      | Concentration in ambient air                 |                                                         |
|-------------------------------------------|----------------------------|----------------------------------------------|---------------------------------------------------------|
|                                           |                            | Industrial, Residential, Rural & other areas | Ecologically Sensitive area (Notified by Central Govt.) |
| SO <sub>2</sub> (µg/m <sup>3</sup> )      | Annual Avg.*<br>24 hours** | 50.0<br>80.0                                 | 20.0<br>80.0                                            |
| NO <sub>x</sub> (µg/m <sup>3</sup> )      | Annual Avg.<br>24 hours    | 40.0<br>80.0                                 | 30.0<br>80.0                                            |
| PM <sub>10</sub> (µg/m <sup>3</sup> )     | Annual Avg.<br>24 hours    | 60.0<br>100.0                                | 60.0<br>100.0                                           |
| PM <sub>2.5</sub> (µg/m <sup>3</sup> )    | Annual Avg.<br>24 hours    | 40.0<br>60.0                                 | 40.0<br>60.0                                            |
| Ozone (O <sub>3</sub> ) µg/m <sup>3</sup> | 8 hours                    | 100.0                                        | 100.0                                                   |

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

### Methodology

- Monitoring was conducted twice a week at five locations using a 24-hour continuous schedule. This schedule is typically divided into three 8-hour shifts to ensure comprehensive daily data.
- Equipment was positioned at a height of **3 ± 0.5 meters** above ground level to minimize the influence of wind-blown ground dust.
- Stations were placed in open spaces at least 20 meters away from trees and vegetation to prevent these sinks from artificially lowering pollutant readings.

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

| Sampling ID | Location        | Distance (km) | Direction | Coordinates   |               |
|-------------|-----------------|---------------|-----------|---------------|---------------|
|             |                 |               |           | Latitude      | Longitude     |
| AAQ1        | Core            | ---           | --        | 12°44'3.03"N  | 79°43'0.04"E  |
| AAQ2        | Menallur        | 1.45          | NW        | 12°44'42.59"N | 79°42'27.10"E |
| AAQ3        | Chinna Elacheri | 1.05          | SW        | 12°43'32.84"N | 79°42'36.22"E |
| AAQ4        | Poonathangal    | 1.33          | NE        | 12°44'36.07"N | 79°43'35.78"E |
| AAQ5        | Mathur          | 5.14          | SW        | 12°42'52.00"N | 79°40'20.73"E |
| AAQ6        | Chittalapakkam  | 2.70          | SE        | 12°42'57.66"N | 79°44'4.80"E  |
| AAQ7        | Sodiyambakkam   | 2.79          | SW        | 12°43'40.93"N | 79°41'25.76"E |

Source: On-site monitoring/sampling **Interstellar Testing Centre Pvt. Ltd** in association with GTMS

The study generated baseline data for four key parameters:

- Particulate Matter (PM<sub>2.5</sub> and PM<sub>10</sub>): Fine and coarse inhalable particles.
- Gaseous Pollutants: Sulphur Dioxide (SO<sub>2</sub>) and Nitrogen Dioxide (NO<sub>x</sub>)

Table 3.15 summarizes the average concentrations of the four pollutants ((PM<sub>2.5</sub>, PM<sub>10</sub>, SO<sub>2</sub> and NO<sub>x</sub>) recorded across the five stations during the three-month period.

Figure 3.17 shows the map identifying the five specific sampling locations and Figures 3.18–3.23 give the graphical representations showing pollutant trends or comparisons for each monitoring station.

**Table 3.16 Summary of AAQ Result**  
**Particulate Matter ( $\mu\text{g}/\text{m}^3$ )**

| Station ID | PM2.5 (Mean) | PM2.5 (98th %) | PM10 (Mean) | PM10 (98th %) |
|------------|--------------|----------------|-------------|---------------|
| AAQ1       | 24.40        | 26.32          | 63.78       | 68.43         |
| AAQ2       | 17.22        | 19.05          | 44.37       | 48.79         |
| AAQ3       | 17.42        | 18.03          | 44.88       | 49.58         |
| AAQ4       | 17.09        | 18.97          | 44.03       | 48.31         |
| AAQ5       | 16.62        | 17.92          | 42.82       | 46.17         |
| AAQ6       | 17.38        | 19.50          | 44.79       | 49.71         |
| AAQ7       | 17.1         | 18.6           | 43.98       | 48.36         |

**Gaseous Pollutants ( $\mu\text{g}/\text{m}^3$ )**

| Station ID | SO <sub>2</sub> (Mean) | SO <sub>2</sub> (98th %) | NO <sub>x</sub> (Mean) | NO <sub>x</sub> (98th %) |
|------------|------------------------|--------------------------|------------------------|--------------------------|
| AAQ1       | 7.50                   | 7.87                     | 15.25                  | 16.38                    |
| AAQ2       | 5.27                   | 5.84                     | 10.54                  | 11.68                    |
| AAQ3       | 5.38                   | 5.90                     | 10.77                  | 11.80                    |
| AAQ4       | 5.25                   | 5.66                     | 10.56                  | 11.63                    |
| AAQ5       | 5.20                   | 5.39                     | 10.47                  | 11.01                    |
| AAQ6       | 5.39                   | 5.82                     | 10.78                  | 11.95                    |
| AAQ7       | 5.31                   | 5.59                     | 10.58                  | 10.80                    |

The station AAQ1 has the highest mean and 98th percentile for all four pollutants suggesting it may be located near a higher-intensity emission source like a major traffic intersection or industrial area. The **98th percentile** values represent the levels that 98% of the data falls below. Since these values (e.g., PM2.5 max of 26.32  $\mu\text{g}/\text{m}^3$  at AAQ1) are close to the mean it suggests a stable environment without extreme daily pollution spikes.

**Pollutant correlation:**

- The PM10 levels (42.82– 68.43  $\mu\text{g}/\text{m}^3$ ) are roughly 2.5 times higher than PM2.5 levels, which is typical in areas where coarse dust (construction, road dust) contributes more than fine combustion particles.
- SO<sub>2</sub> and NO<sub>x</sub> levels are closely linked likely originating from common vehicular or industrial sources.

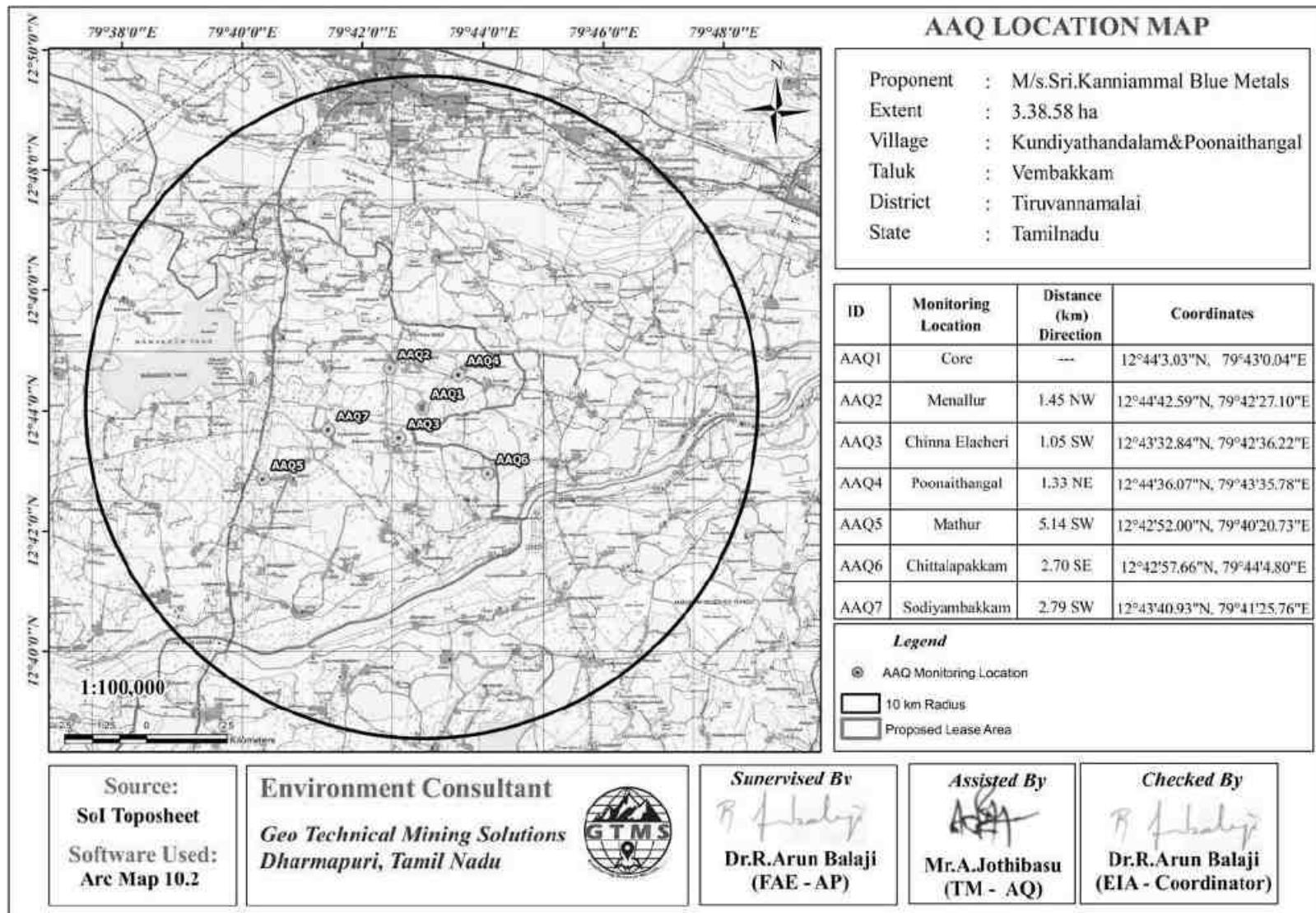


Figure 3.17 Map Showing Ambient Air Quality Monitoring Station Locations Around 10 km Radius from Proposed Project Site

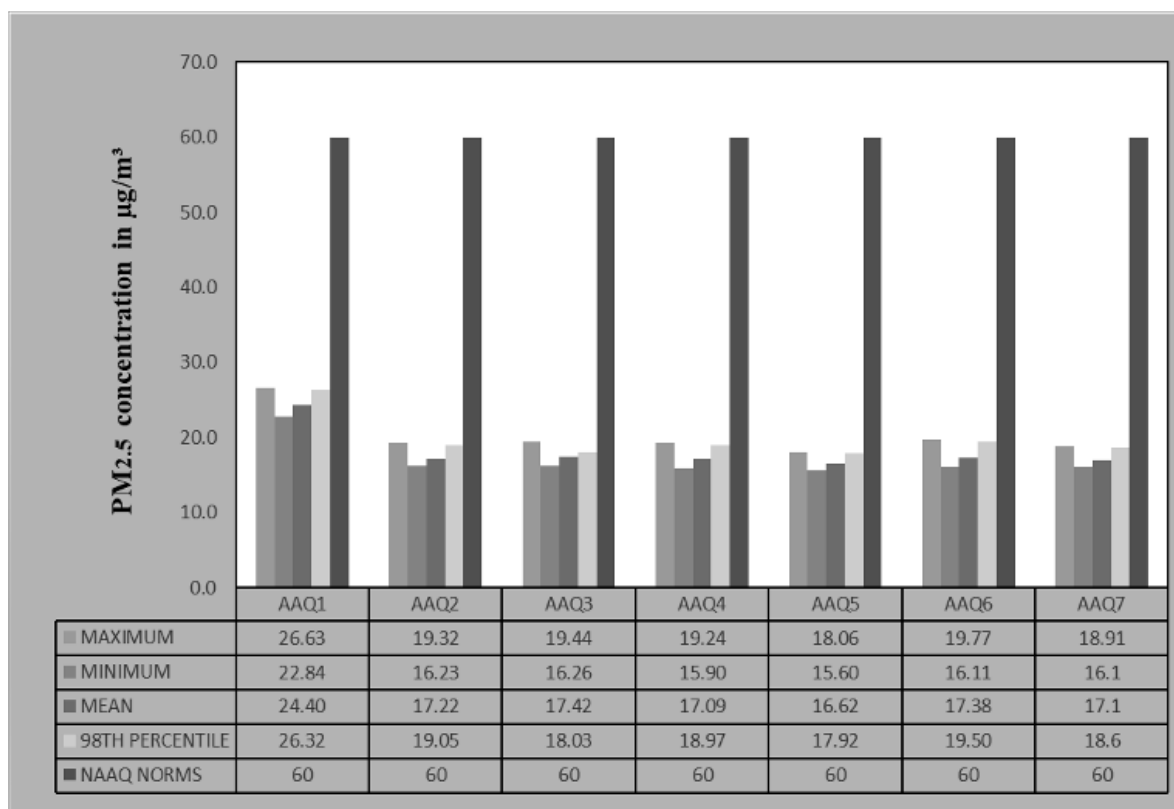


**Figure 3.18 Bar Chart Showing Maximum, Minimum, and Average Concentrations of PM<sub>2.5</sub> Measured from 7 Air Quality Monitoring Stations within 10km Radius**

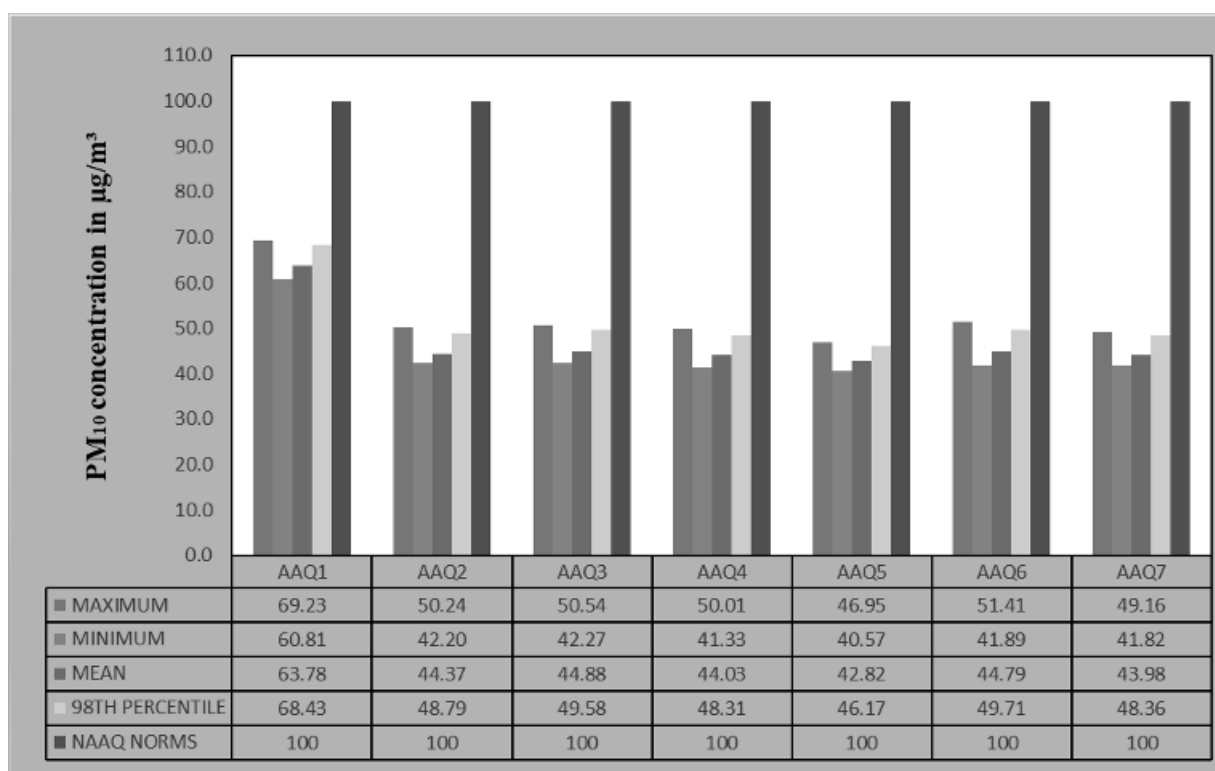


**Figure 3.19 Bar Chart Showing Maximum, Minimum, and Average Concentrations of PM<sub>10</sub> Measured from 7 Air Quality Monitoring Stations within 10km Radius**



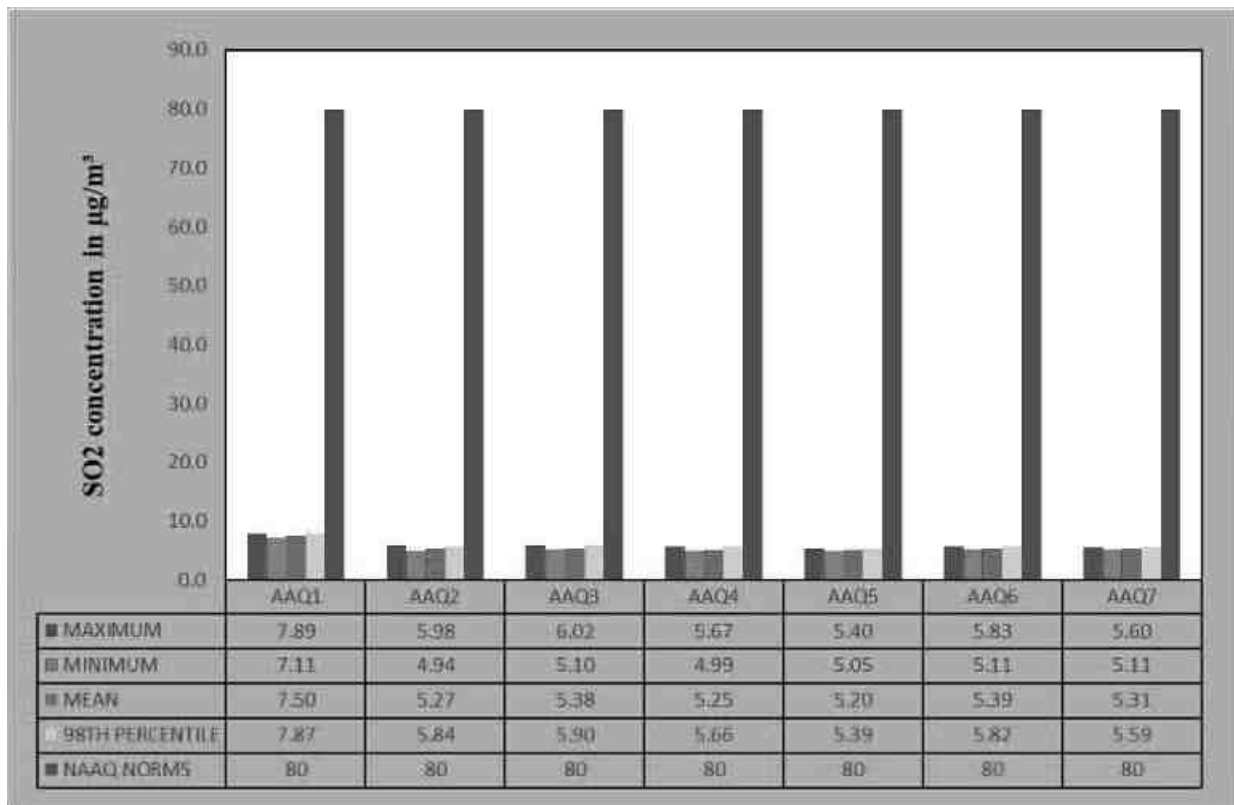


**Figure 3.20 Bar Chart Showing Maximum, Minimum, and Average Concentrations of SO<sub>2</sub> Measured from 7 Air Quality Monitoring Stations within 10km Radius**

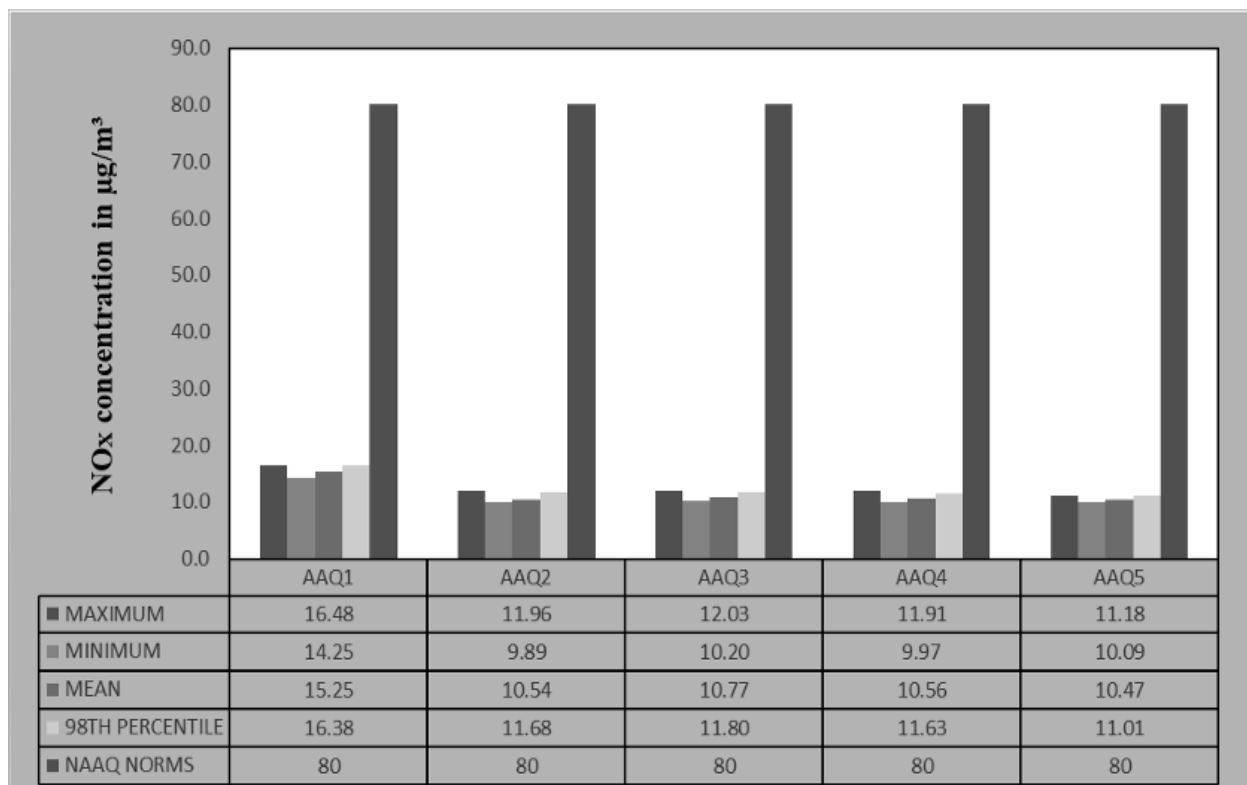


**Figure 3.21 Bar Chart Showing Maximum, Minimum, and Average Concentrations of NO<sub>x</sub> Measured from 7 Air Quality Monitoring Stations within 10km Radius**

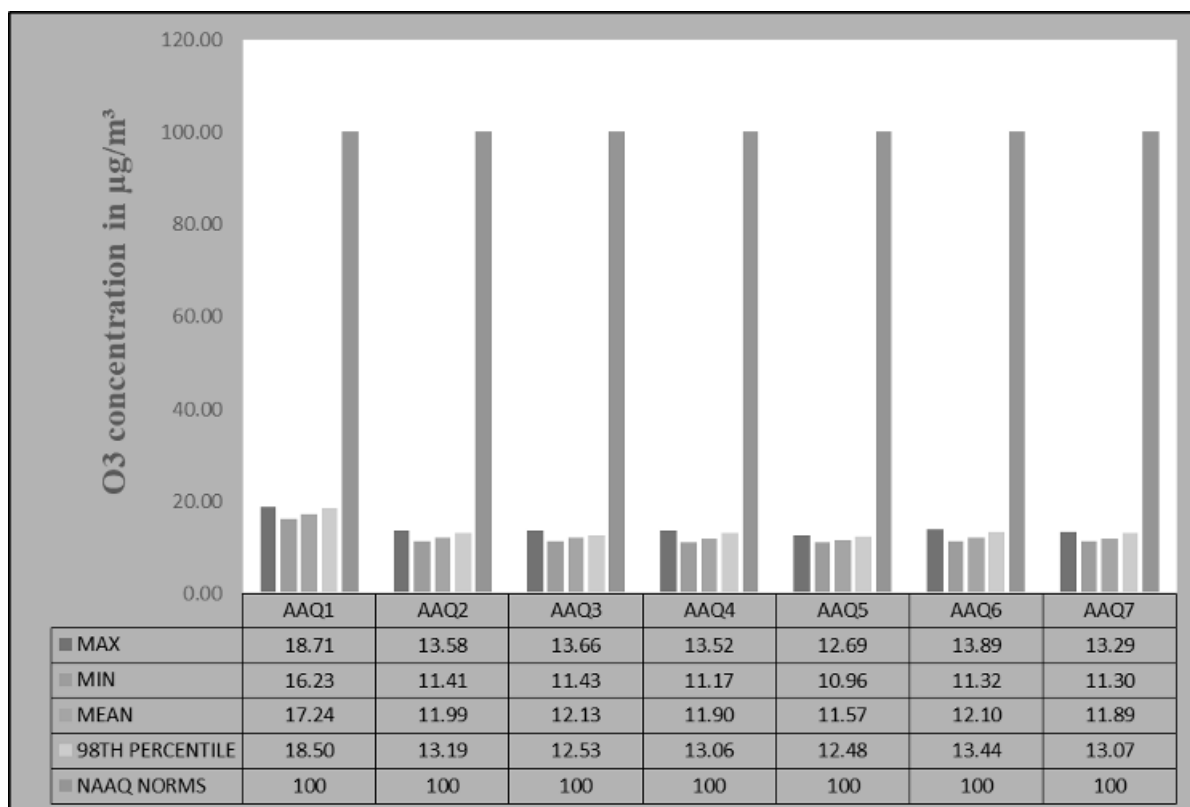


**Figure 3.22 Bar Chart Showing Maximum, Minimum, and Average Concentrations of O<sub>3</sub> Measured from 7 Air Quality Monitoring Stations within 10km Radius**

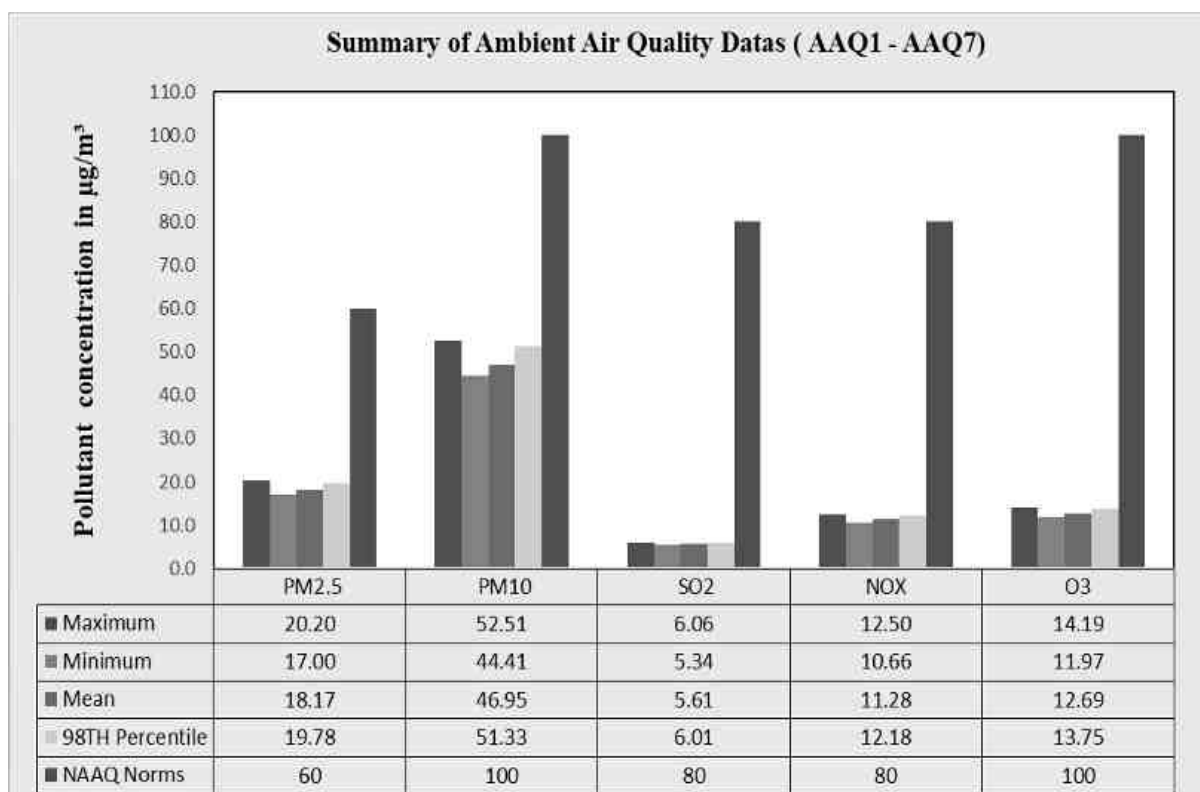


**Figure 3.23 Bar Chart Showing Maximum, Minimum, And Average Concentrations of Pollutants in Atmosphere within 10km Radius**

### 3.4 NOISE ENVIRONMENT

The vehicular movement on road and mining activities is the major sources of noise in the study area. The main objective of noise monitoring in the study area is to establish the baseline noise level, which will in turn be used to assess the impact of the total noise expected to be generated during the project operations around the project site. In order to assess the ambient noise levels within the study area, noise monitoring was carried out at Seven (07) 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 3.24.

**Table 3.17 Noise Monitoring Locations**

| Sampling ID | Location        | Distance (km) | Direction | Coordinates   |               |
|-------------|-----------------|---------------|-----------|---------------|---------------|
|             |                 |               |           | Latitude      | Longitude     |
| N1          | Core            | 0.02          | NE        | 12°43'59.98"N | 79°42'59.50"E |
| N2          | Chinna Elacheri | 0.96          | SW        | 12°43'36.00"N | 79°42'37.37"E |
| N3          | Poonathangal    | 1.25          | NE        | 12°44'34.00"N | 79°43'34.26"E |
| N4          | Menallur        | 1.32          | NW        | 12°44'47.27"N | 79°42'48.81"E |
| N5          | Valavanthal     | 2.83          | NW        | 12°44'39.74"N | 79°41'28.92"E |
| N6          | Chittalapakkam  | 2.85          | SE        | 12°42'57.64"N | 79°44'11.41"E |
| N7          | Sodiyambakkam   | 3.01          | NW        | 12°43'40.70"N | 79°41'20.26"E |

**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 (Leq in dB (A))      |                                 |
| N1         | Core            | Industrial Area       | 58.8                            | 45.1                              | 75                            | 70                              |
| N2         | Chinna Elacheri | Residential Area      | 42.1                            | 38.9                              | 55                            | 45                              |
| N3         | Poonathangal    |                       | 42.4                            | 40.1                              |                               |                                 |
| N4         | Menallur        |                       | 42.0                            | 40.4                              |                               |                                 |
| N5         | Valavanthal     |                       | 47.3                            | 43.2                              |                               |                                 |
| N6         | Chittalapakkam  |                       | 43.6                            | 41.9                              |                               |                                 |
| N7         | Sodiyambakkam   |                       | 39.9                            | 39.5                              |                               |                                 |

*Source: On-site monitoring/sampling by Interstellar Testing Centre Pvt. Ltd in association with GTMS*

The Table 3.18 shows that noise level in core zone was 58.8dB (A) Leq during day time and 45.1dB(A) Leq during night time. Noise levels recorded in buffer zone during day time varied from 39.9 to 43.6dB (A) Leq and during night time from 38.9 to 43.2dB (A) Leq. Thus, the noise level for industrial and residential area meets the requirements of CPCB. The results are also depicted below in Figures 3.25 and 3.26.

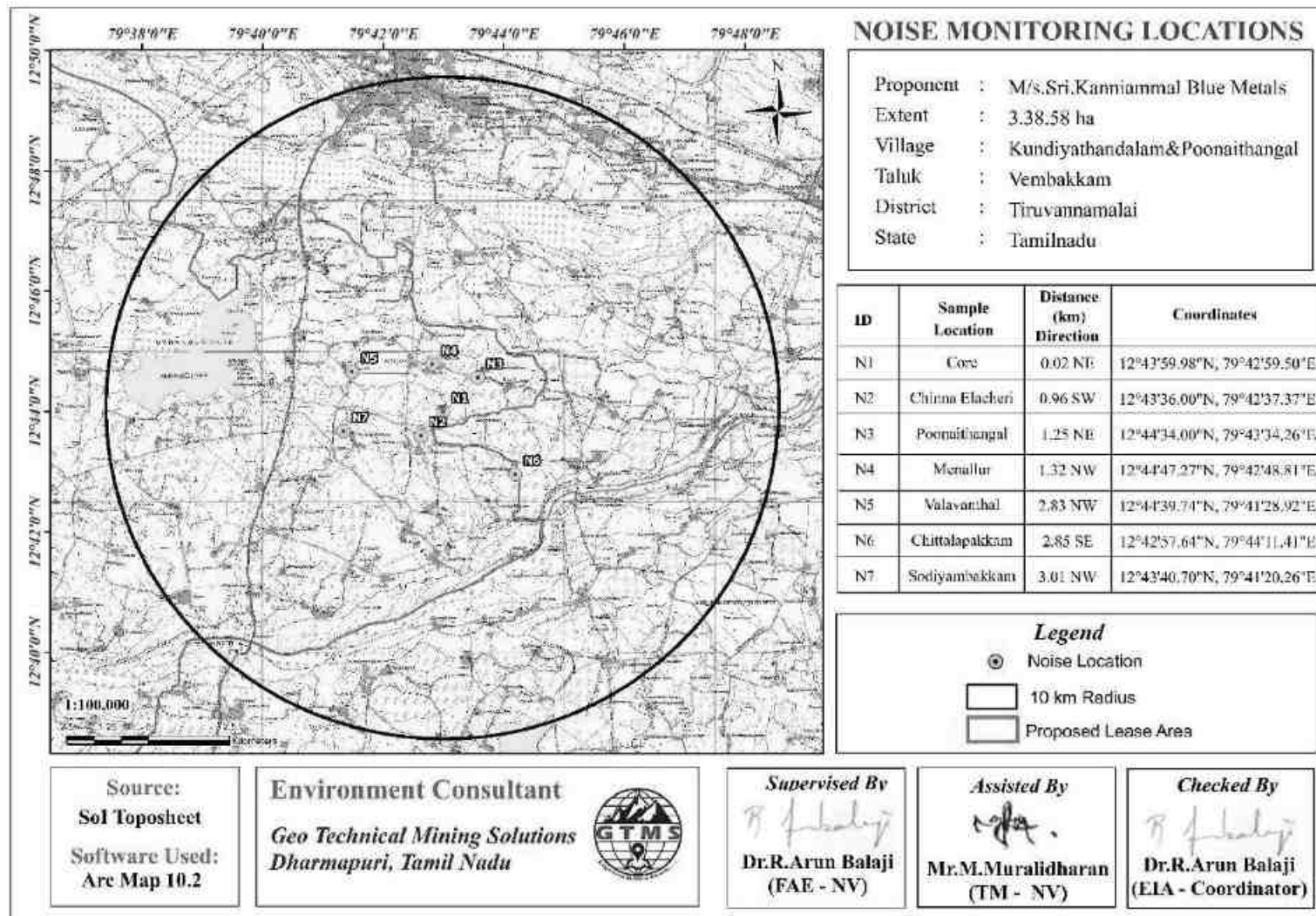


Figure 3.24 Map Showing Noise Level Monitoring Station Locations around 10 km Radius from Proposed Project Site

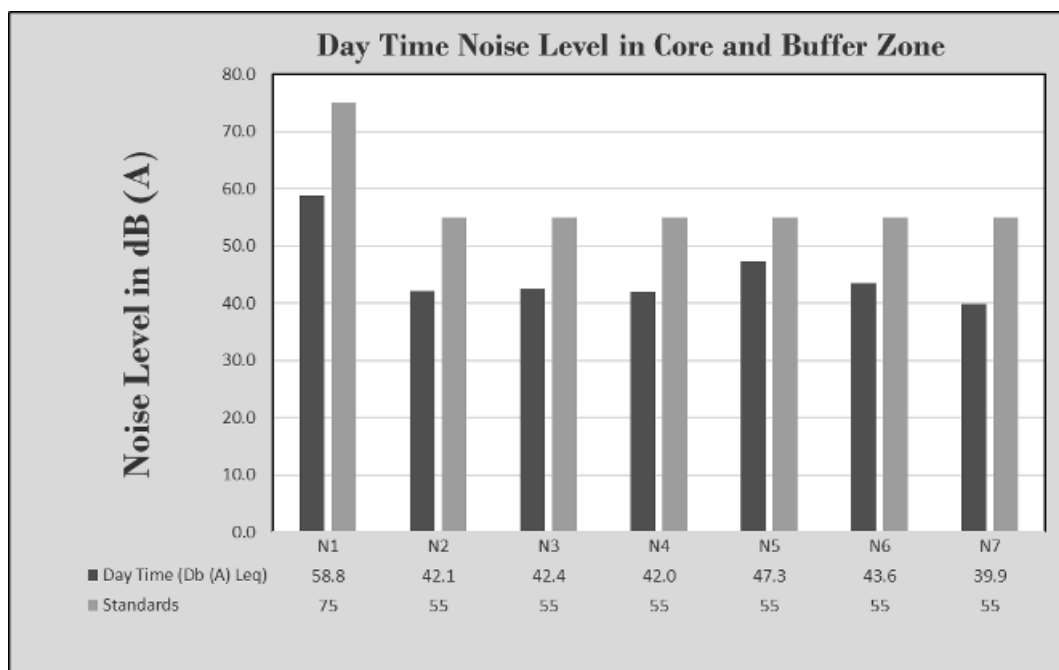


**Figure 3.25 Bar Chart Showing Day Time Noise Levels Measured in Core and Buffer Zones**

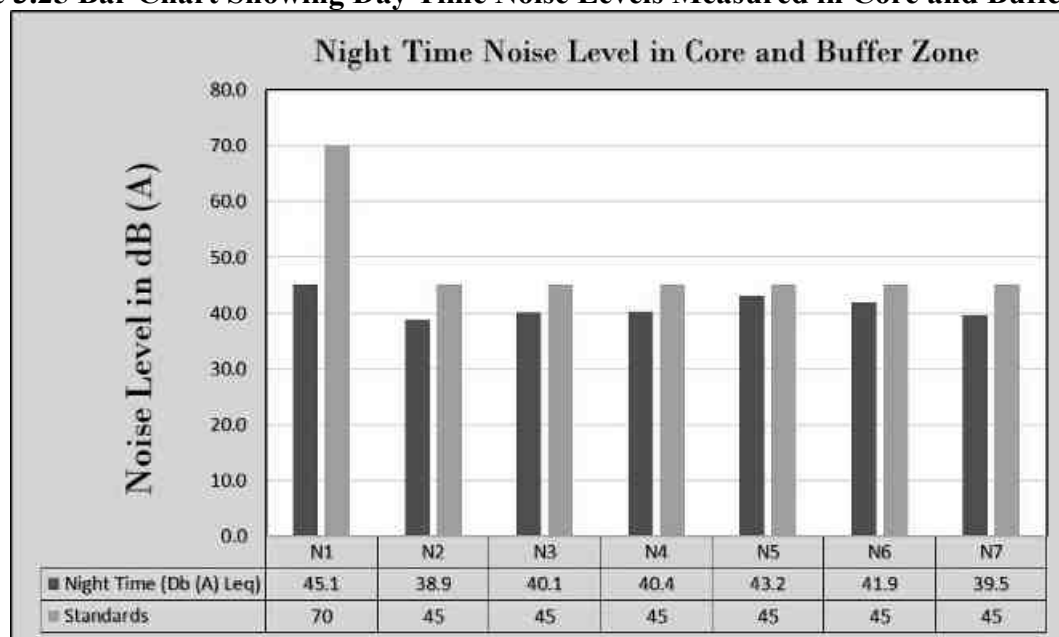


**Figure 3.26 Bar Chart Showing Night Time Noise Levels Measured in Core and Buffer Zones**

### 3.5 BIOLOGICAL ENVIRONMENT

Collection of comprehensive baseline information on flora and fauna is a prerequisite for assessment of impacts of any extractive industries/ activities. Biological environment is an important component of the environment of any area. It covers flora & fauna in the region, details of forests and wildlife sanctuaries in the region, with list of endangered species. Over the years ecological and along with it the loss of biological diversity has become a national and a global concern. Ecological assessment therefore is very critical for decision making and for the setting of a developmental project or an industry. An ecological study of the ecosystem is

essential to understand the impact of industrialization and urbanization on existing flora and fauna of the area. Studies on various aspects of ecosystem play an important role in identifying sensitive issues for undertaking appropriate action to mitigate the impact, if any.

The objective of this Section is to characterize and understand the present status of the ecosystems in the study area to assess the bio-diversity and to identify the critical areas. The present study was undertaken as a part of EIA report to understand the present status of ecosystem prevailing in the study area, to compare it with the past condition with the help of available data, to predict changes as a result of present activities and to suggest measures for maintaining the conditions.



**Figure 3.27 Quadrates Sampling Methods of Flora**

### **3.5.1 Flora**

#### **3.5.1.1 Objectives of the Study**

The ecological study of the area was conducted in order to understand the existing status of the flora and fauna to generate baseline information and evaluate the possible impacts on biological environment. The present study highlights the various issues pertaining to floristic diversity and faunal wealth in the surrounding area up to 10km radius from the proposed expansion project.

#### **3.5.1.2 Study Approach & Methodology**

The baseline study for existing ecological environment was carried out during study period. A participatory and consultative approach was followed. Field visits were under taken for survey of the aquatic and terrestrial vegetation and animals in the study area.

Nested quadrat sampling method was used for the study of community structure of the vegetation. The sampling consisted of randomly placed quadrats of 10m × 10m were laid down to assess trees, and sub quadrats of 5 m × 5 m were laid down for shrubs, 1m x 1m were laid

done for herbs. The size and number of quadrats needed were determined using the species-area curve (Misra, 1968). The data on vegetation were quantitatively analysed for abundance, density, frequency as per Curtis & McIntosh (1950). The Important Value Index (IVI) for trees was determined as the sum of relative density, relative frequency and relative dominance (Curtis, 1959).

### **3.5.1.3 Survey Methodology**

The baseline study for existing biological environmental was carried out in Nov 2024. Study of flora and fauna carried out as per prescribed method addressed in SOP. Field visits were under taken for survey of the vegetation and animals in the study area. The study area is divided into three parts as project site area along with 500m from all direction surrounding site is being considered as core area and rest of 5km study area is buffer part of the study area.

### **3.5.1.4 Important Value Index (IVI)**

The concept of ‘Important Value Index (IVI)’ has been developed for expressing the dominance and ecological success of any species, with a single value (Mishra, 1968, Sharma, 2005). This index utilizes three characteristics, they are (i) Relative frequency and (ii) Relative density. The three characteristics computed using frequency, density and abundance for all the species falling in all the quadrat by using the following formula. The relative frequency, relative density and relative abundance has been calculated to calculate the IVI value

$$IVI = \text{Relative frequency} + \text{Relative abundance} + \text{Relative density} [RF + RA + RD]$$

$$\text{Relative Value Index (RVI)} = \text{Relative Density} + \text{Relative Frequency} [RD + RF].$$

Relative Value Index used for Expressing dominance and Ecological success of Shrub and herb Species in a particular area.

### **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 **Shannon Diversity Index** (sometimes called the Shannon-Wiener Index) is a way to measure the diversity of species in a community.

The species diversity index (H) for floral and faunal diversity is calculated by the use of Shannon Wiener Index (Shannon Wiener, 1963) as:

$$H = - \sum (n_i/n) \times \ln (n_i/n)$$

- ✚ Where,  $n_i$  is individual density of a species and  $n$  is total density of all the species
- ✚ The Evenness Index (E) is calculated by using Shannon's Evenness formula (Magurran, 2004).
- ✚ The higher the value of  $H$ , the higher the diversity of species in a particular community

The lower the value of  $H$ , the lower the diversity. A value of  $H = 0$  indicates a community that only has one species

$$\text{Evenness Index (E)} = H / \ln(S)$$

Where,  $H$  is Shannon Wiener Diversity index;  $S$  is number of species

The Shannon evenness Index is a way to measure the evenness of species in a community. The term “evenness” simply refers to how similar the abundances of different species are in the community.

### 3.5.1.5 Floral diversity Analysis

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

#### ***Flora in core zone***

There are no trees in inside of the mining lease area, but there are 60 *Borassus flabellifer* trees, *Morinda citrifolia* 5 and *Azadirachta indica* 4 within a 7.5-meter safety zone.

#### ***Flora in 300m radius***

Taxonomically, a total of 33 species belonging to 19 families have been recorded from the 300m radius from the mining lease area. The species in the 300m radius include herbs (18), trees (08), shrubs (05), the 19 families, Fabaceae and Lamiaceae are the main dominating species in the study area, Species Richness (margalef Index) in the study area it mentioned in Table 3.19-3.21 Moreover, no species are found as threatened category. There is government land around 300 meters. *Vachelia leucophylla* is the dominant tree followed by *Phoenix sylvestris* tree, *Carissa carandas*, *Casapella thevetia* and *Lantana camara* tree.

#### ***Flora in 10km radius zone***

In the buffer zone, a total of 81 species belonging to 41 families were recorded. Among them are trees (32), shrubs (14), herbs (38), climbers (09), creepers (5), grasses (4), and cactus (1). Majority of the species belongs to the family of Fabaceae and Poaceae, as mentioned in Table 3.22. Species Richness (margalef Index) in the study area it mentioned in Table 3.22 Moreover, no species are found as threatened category.



**Table 3.19 Flora in 300m Radius**

| S.No.         | Local Name       | Scientific name              | Family name | Total No. of species | Total of Quadrants with | Total No. of Quadrants | Density | Frequency (%) | Abundance | Relative Density | Relative Frequency | IVI  | IUCN Conservation Status |
|---------------|------------------|------------------------------|-------------|----------------------|-------------------------|------------------------|---------|---------------|-----------|------------------|--------------------|------|--------------------------|
| <b>Trees</b>  |                  |                              |             |                      |                         |                        |         |               |           |                  |                    |      |                          |
| 1             | Velikathan maram | <i>Prosopis juliflora</i>    | Fabaceae    | 6                    | 5                       | 10                     | 0.6     | 50.0          | 1.2       | 12.8             | 12.8               | 25.6 | Not Listed               |
| 2             | Panai maram      | <i>Borassus flabellifer</i>  | Arecaceae   | 5                    | 4                       | 10                     | 0.5     | 40.0          | 1.3       | 10.6             | 10.3               | 20.9 | Not Listed               |
| 3             | Nuna maram       | <i>Morinda citrifolia</i>    | Rubiaceae   | 7                    | 6                       | 10                     | 0.7     | 60.0          | 1.2       | 14.9             | 15.4               | 30.3 | Not Listed               |
| 4             | Vembu            | <i>Azadirachta indica</i>    | Meliaceae   | 6                    | 5                       | 10                     | 0.6     | 50.0          | 1.2       | 12.8             | 12.8               | 25.6 | Not Listed               |
| 5             | Vagai            | <i>Albizia lebbek</i>        | Fabaceae    | 5                    | 4                       | 10                     | 0.5     | 40.0          | 1.3       | 10.6             | 10.3               | 20.9 | Not Listed               |
| 6             | Eshamaram        | <i>Phoenix Reclinata</i>     | Arecaceae   | 7                    | 6                       | 10                     | 0.7     | 60.0          | 1.2       | 14.9             | 15.4               | 30.3 | Not Listed               |
| 7             | Teaku            | <i>Tectona grandis</i>       | Lamiaceae   | 6                    | 5                       | 10                     | 0.6     | 50.0          | 1.2       | 12.8             | 12.8               | 25.6 | Not Listed               |
| 8             | Veallai vealan   | <i>Vachellia leucophloea</i> | Fabaceae    | 5                    | 4                       | 10                     | 0.5     | 40.0          | 1.3       | 10.6             | 10.3               | 20.9 | Lest Concern             |
| <b>Shrubs</b> |                  |                              |             |                      |                         |                        |         |               |           |                  |                    |      |                          |
| 9             | Erukku           | <i>Calotropis gigantea</i>   | Apocynaceae | 9                    | 8                       | 15                     | 0.6     | 53.3          | 1.1       | 22.0             | 22.2               | 44.2 | Not Listed               |
| 10            | Kela chadi       | <i>Carissa carandas</i>      | Apocynaceae | 8                    | 7                       | 15                     | 0.5     | 46.7          | 1.1       | 19.5             | 19.4               | 39.0 | Not Listed               |
| 11            | Arali            | <i>Casapella thevetia</i>    | Apocynaceae | 7                    | 6                       | 15                     | 0.5     | 40.0          | 1.2       | 17.1             | 16.7               | 33.7 | Not Listed               |
| 12            | Sappathikalli    | <i>Cereus pterogonus</i>     | Cactaceae   | 9                    | 8                       | 15                     | 0.6     | 53.3          | 1.1       | 22.0             | 22.2               | 44.2 | Not Listed               |
| 13            | Unichedi         | <i>Lantana camara</i>        | Verbenaceae | 8                    | 7                       | 15                     | 0.5     | 46.7          | 1.1       | 19.5             | 19.4               | 39.0 | Not Listed               |

| Herbs, Climbers & Grass |                   |                              |                |    |    |    |     |      |     |     |     |      |            |
|-------------------------|-------------------|------------------------------|----------------|----|----|----|-----|------|-----|-----|-----|------|------------|
| 14                      | Thumbai           | <i>Leucas aspera</i>         | Lamiaceae      | 8  | 7  | 20 | 0.4 | 35.0 | 1.1 | 5.4 | 5.4 | 10.9 | Not Listed |
| 15                      | Kantang kathrikai | <i>Solanum virginianum</i>   | Solanaceae     | 7  | 6  | 20 | 0.4 | 30.0 | 1.2 | 4.8 | 4.7 | 9.4  | Not Listed |
| 16                      | Arugampul         | <i>Cynodon dactylon</i>      | Poaceae        | 10 | 9  | 20 | 0.5 | 45.0 | 1.1 | 6.8 | 7.0 | 13.8 | Not Listed |
| 17                      | Poolai poondu     | <i>Aerva lanata</i>          | Amaranthaceae  | 8  | 7  | 20 | 0.4 | 35.0 | 1.1 | 5.4 | 5.4 | 10.9 | Not Listed |
| 18                      | Korai             | <i>Cyperus rotundus</i>      | Cyperaceae     | 6  | 5  | 20 | 0.3 | 25.0 | 1.2 | 4.1 | 3.9 | 8.0  | Not Listed |
| 19                      | Nearunji          | <i>Tribulus terrestris</i>   | Zygophyllales  | 8  | 7  | 20 | 0.4 | 35.0 | 1.1 | 5.4 | 5.4 | 10.9 | Not Listed |
| 20                      | Nayuruvi          | <i>Achyranthes aspera</i>    | Amaranthaceae  | 7  | 6  | 20 | 0.4 | 30.0 | 1.2 | 4.8 | 4.7 | 9.4  | Not Listed |
| 21                      | Vilaiti tulsi     | <i>hyptis suaveolens</i>     | Lamiaceae      | 11 | 10 | 20 | 0.6 | 50.0 | 1.1 | 7.5 | 7.8 | 15.2 | Not Listed |
| 22                      | Pink Blumea       | <i>Blumea axillaris</i>      | Asteraceae     | 8  | 7  | 20 | 0.4 | 35.0 | 1.1 | 5.4 | 5.4 | 10.9 | Not Listed |
| 23                      | Rail poondu       | <i>Croton bonplandianus</i>  | Euphorbiaceae  | 7  | 6  | 20 | 0.4 | 30.0 | 1.2 | 4.8 | 4.7 | 9.4  | Not Listed |
| 24                      | Communist pacha   | <i>Chromolaena odorata</i>   | Asteraceae     | 8  | 7  | 20 | 0.4 | 35.0 | 1.1 | 5.4 | 5.4 | 10.9 | Not Listed |
| 25                      | Veattukaya poondu | <i>Tridax Procumbens</i>     | Asteraceae     | 9  | 8  | 20 | 0.5 | 40.0 | 1.1 | 6.1 | 6.2 | 12.3 | Not Listed |
| 26                      | Kundumani         | <i>Abrus precatorius</i>     | Fabaceae       | 8  | 7  | 20 | 0.4 | 35.0 | 1.1 | 5.4 | 5.4 | 10.9 | Not Listed |
| 27                      | Mosukkattan       | <i>Passiflora foetida</i>    | Passifloraceae | 7  | 6  | 20 | 0.4 | 30.0 | 1.2 | 4.8 | 4.7 | 9.4  | Not Listed |
| 28                      | Perandai          | <i>Cissus quadrangularis</i> | Vitaceae       | 10 | 9  | 20 | 0.5 | 45.0 | 1.1 | 6.8 | 7.0 | 13.8 | Not Listed |
| 29                      | Kandakathari      | <i>Solanum xanthocarpum</i>  | Solanaceae     | 8  | 7  | 20 | 0.4 | 35.0 | 1.1 | 5.4 | 5.4 | 10.9 | Not Listed |
| 30                      | Arugam Pill       | <i>Cynodon dactylon</i>      | Poaceae        | 9  | 8  | 20 | 0.5 | 40.0 | 1.1 | 6.1 | 6.2 | 12.3 | Not Listed |
| 31                      | Paspalum          | <i>Paspalum quadrifarium</i> | Poaceae        | 8  | 7  | 20 | 0.4 | 35.0 | 1.1 | 5.4 | 5.4 | 10.9 | Not Listed |

LC- Least Concern - [Species categorized as Least Concern (LC) is a taxon when it has been evaluated against the Red List criteria and does not qualify for Endangered Near Threatened.], DD – Data Deficient [Species categorized as DD is a taxon when there is no inadequate information to make a direct, VU- Vulnerable indirect assessment of its risk of extinction based on its distribution and/or population status].

<https://www.iucnredlist.org/> <https://bsi.gov.in/uploads/documents/research-program/Threatened-plants-of%20India.pdf>

**Table 3.20 Calculation of Species Diversity in 300m Radius**

| S. No                             | Common name      | Scientific name              | No. of Species | Pi   | ln (Pi) | Pi x ln (Pi) |
|-----------------------------------|------------------|------------------------------|----------------|------|---------|--------------|
| <b>Tree</b>                       |                  |                              |                |      |         |              |
| 1                                 | Velikathan maram | <i>Prosopis juliflora</i>    | 6              | 0.13 | -2.06   | -0.26        |
| 2                                 | Panai maram      | <i>Borassus flabellifer</i>  | 5              | 0.11 | -2.24   | -0.24        |
| 3                                 | Nuna maram       | <i>Morinda citrifolia</i>    | 7              | 0.15 | -1.90   | -0.28        |
| 4                                 | Vembu            | <i>Azadirachta indica</i>    | 6              | 0.13 | -2.06   | -0.26        |
| 5                                 | Vagai            | <i>Albizia lebeck</i>        | 5              | 0.11 | -2.24   | -0.24        |
| 6                                 | Eshamaram        | <i>Phoenix reclinata</i>     | 7              | 0.15 | -1.90   | -0.28        |
| 7                                 | Teaku            | <i>Tectona grandis</i>       | 6              | 0.13 | -2.06   | -0.26        |
| 8                                 | Veallai vealan   | <i>Vachellia leucophloea</i> | 5              | 0.11 | -2.24   | -0.24        |
| H (Shannon Diversity Index) =2.07 |                  |                              |                |      |         |              |
| <b>Shrubs</b>                     |                  |                              |                |      |         |              |
| 9                                 | Erukku           | <i>Calotropis gigantea</i>   | 9              | 0.22 | -1.52   | -0.33        |
| 10                                | Kela chadi       | <i>Carissa carandas</i>      | 8              | 0.20 | -1.63   | -0.32        |
| 11                                | Arali            | <i>Casapella thevetia</i>    | 7              | 0.17 | -1.77   | -0.30        |
| 12                                | Sappathikalli    | <i>Cereus pterogonus</i>     | 9              | 0.22 | -1.52   | -0.33        |
| 13                                | Unichedi         | <i>Lantana camara</i>        | 8              | 0.20 | -1.63   | -0.32        |
| H (Shannon Diversity Index) =1.61 |                  |                              |                |      |         |              |
| <b>Herbs</b>                      |                  |                              |                |      |         |              |
| 14                                | Thumbai          | <i>Leucas aspera</i>         | 8              | 0.05 | -2.91   | -0.16        |
| 15                                | Katang kathrikai | <i>Solanum virginianum</i>   | 7              | 0.05 | -3.04   | -0.14        |
| 16                                | Arugampul        | <i>Cynodon dactylon</i>      | 10             | 0.07 | -2.69   | -0.18        |
| 17                                | Poolai poondu    | <i>Aerva lanata</i>          | 8              | 0.05 | -2.91   | -0.16        |
| 18                                | Korai            | <i>Cyperus rotundus</i>      | 6              | 0.04 | -3.20   | -0.13        |
| 19                                | Nerunji          | <i>Tribulus terrestris</i>   | 8              | 0.05 | -2.91   | -0.16        |
| 20                                | Nayuruv          | <i>Achyranthes aspera</i>    | 7              | 0.05 | -3.04   | -0.14        |
| 21                                | Vilaiti tulsi    | <i>Hyptis suaveolens</i>     | 11             | 0.07 | -2.59   | -0.19        |
| 22                                | Pink Blumea      | <i>Blumea axillaris</i>      | 8              | 0.05 | -2.91   | -0.16        |
| 23                                | Rail Pindu       | <i>Croton bonplandianus</i>  | 7              | 0.05 | -3.04   | -0.14        |
| 24                                | Communist pacha  | <i>Chromolaena odorata</i>   | 8              | 0.05 | -2.91   | -0.16        |
| 25                                | veattukayapundu  | <i>Tridax Procumbens</i>     | 9              | 0.06 | -2.79   | -0.17        |
| 26                                | Kundumani        | <i>Abrus precatorius</i>     | 8              | 0.05 | -2.91   | -0.16        |
| 27                                | Mosukkattan      | <i>Passiflora foetida</i>    | 7              | 0.05 | -3.04   | -0.14        |
| 28                                | Perandai         | <i>Cissus quadrangularis</i> | 10             | 0.07 | -2.69   | -0.18        |

|                                   |              |                              |   |      |       |       |
|-----------------------------------|--------------|------------------------------|---|------|-------|-------|
| 29                                | Kandakathari | <i>Solanum xanthocarpum</i>  | 8 | 0.05 | -2.91 | -0.16 |
| 30                                | Arugam Pill  | <i>Cynodon dactylon</i>      | 9 | 0.06 | -2.79 | -0.17 |
| 31                                | paspalum     | <i>Paspalum quadrifarium</i> | 8 | 0.05 | -2.91 | -0.16 |
| H (Shannon Diversity Index) =2.88 |              |                              |   |      |       |       |

**Table 3.21 Species Richness (Index) in 300m Radius**

| Details | H    | H max | Evenness | Species Richness |
|---------|------|-------|----------|------------------|
| Tree    | 2.07 | 2.08  | 1.00     | 1.82             |
| Herbs   | 1.61 | 1.61  | 1.00     | 1.08             |
| Shrubs  | 2.88 | 2.89  | 1.00     | 3.41             |

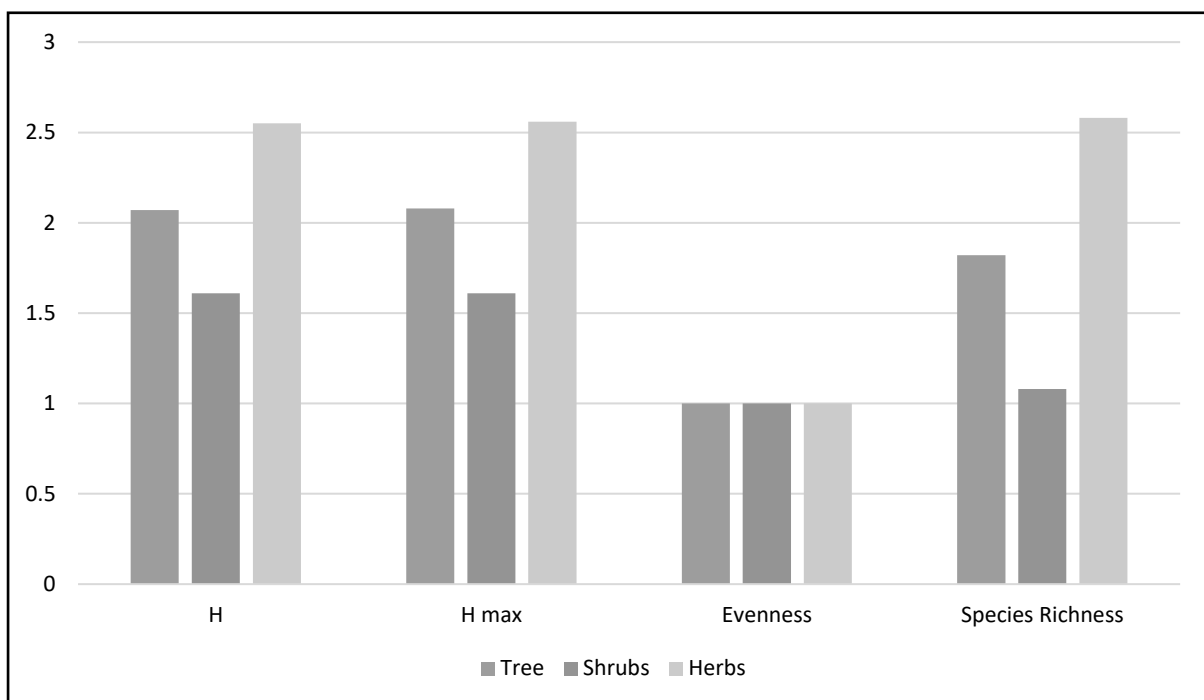


**Figure 3.28 Floral Diversity Species Richness (Index) 300m Radius**

From the above, it can be interpreted that herb community has higher diversity. While the tree community shows less diversity. It is also observed that most of the quadrates have controlled generation of plant species with older strands. Higher herb species diversity can be interpreted as a greater number of successful species and a more stable ecosystem where more ecological niches are available, environmental change is less likely to be damaging to the ecosystem as a whole. Species richness is high for herb community when compared with tree and shrubs.

**Table 3.22 Flora in 10km 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>Trees</b> |                 |                              |                |                      |                                 |                        |         |               |           |                  |                    |     |                          |
| 1            | Vembu           | <i>Azadirachta indica</i>    | Meliaceae      | 5                    | 4                               | 10                     | 0.5     | 40.0          | 1.3       | 2.9              | 2.9                | 5.8 | Not Listed               |
| 2            | Pongam oiltree  | <i>Pongamia pinnata</i>      | Fabaceae       | 4                    | 3                               | 10                     | 0.4     | 30.0          | 1.3       | 2.3              | 2.2                | 4.5 | Not Listed               |
| 3            | Karuvelam       | <i>Acacia nilotica</i>       | Mimosaceae     | 5                    | 4                               | 10                     | 0.5     | 40.0          | 1.3       | 2.9              | 2.9                | 5.8 | Not Listed               |
| 4            | Thennai maram   | <i>Cocos nucifera</i>        | Arecaceae      | 4                    | 3                               | 10                     | 0.4     | 30.0          | 1.3       | 2.3              | 2.2                | 4.5 | Not Listed               |
| 5            | Puliyamaram     | <i>Tamarindus indica</i>     | Legumes        | 5                    | 4                               | 10                     | 0.5     | 40.0          | 1.3       | 2.9              | 2.9                | 5.8 | Not Listed               |
| 6            | Athi            | <i>Ficus recemosa</i>        | Moraceae       | 6                    | 5                               | 10                     | 0.6     | 50.0          | 1.2       | 3.5              | 3.6                | 7.1 | Not Listed               |
| 7            | Vazhaimaram     | <i>Musa</i>                  | Musaceae       | 4                    | 3                               | 10                     | 0.4     | 30.0          | 1.3       | 2.3              | 2.2                | 4.5 | Not Listed               |
| 8            | Nettilinkam     | <i>Polylathia longifolia</i> | Annonaceae     | 6                    | 5                               | 10                     | 0.6     | 50.0          | 1.2       | 3.5              | 3.6                | 7.1 | Not Listed               |
| 9            | Amanakku        | <i>Ricinus communis</i>      | Euphorbiaceae  | 5                    | 4                               | 10                     | 0.5     | 40.0          | 1.3       | 2.9              | 2.9                | 5.8 | Not Listed               |
| 10           | Perumungil      | <i>Bambusa bambos</i>        | Poaceae        | 4                    | 3                               | 10                     | 0.4     | 30.0          | 1.3       | 2.3              | 2.2                | 4.5 | Not Listed               |
| 11           | Karungali       | <i>Acacia sundra</i>         | Legumes        | 6                    | 5                               | 10                     | 0.6     | 50.0          | 1.2       | 3.5              | 3.6                | 7.1 | Not Listed               |
| 12           | Sapota          | <i>Manilkara zapota</i>      | Sapotaceae     | 7                    | 6                               | 10                     | 0.7     | 60.0          | 1.2       | 4.1              | 4.3                | 8.4 | Not Listed               |
| 13           | Eucalyptus      | <i>Eucalyptus globules</i>   | Myrtaceae      | 6                    | 5                               | 10                     | 0.6     | 50.0          | 1.2       | 3.5              | 3.6                | 7.1 | Not Listed               |
| 14           | Navalmaram      | <i>Sygygium cumini</i>       | Myrtaceae      | 7                    | 6                               | 10                     | 0.7     | 60.0          | 1.2       | 4.1              | 4.3                | 8.4 | Not Listed               |
| 15           | Ezhumuchaipalam | <i>Citrus lemon</i>          | Rutaceae       | 8                    | 7                               | 10                     | 0.8     | 70.0          | 1.1       | 4.7              | 5.0                | 9.7 | Not Listed               |
| 16           | Alamaram        | <i>Ficus benghalensis</i>    | Moraceae       | 3                    | 2                               | 10                     | 0.3     | 20.0          | 1.5       | 1.8              | 1.4                | 3.2 | Not Listed               |
| 17           | Panai maram     | <i>Borassus flabellifer</i>  | Arecaceae      | 5                    | 4                               | 10                     | 0.5     | 40.0          | 1.3       | 2.9              | 2.9                | 5.8 | Not Listed               |
| 18           | Manga           | <i>Mangifera indica</i>      | Anacardiaceae  | 7                    | 6                               | 10                     | 0.7     | 60.0          | 1.2       | 4.1              | 4.3                | 8.4 | Not Listed               |
| 19           | Thekku          | <i>Tectona grandis</i>       | Verbenaceae    | 4                    | 3                               | 10                     | 0.4     | 30.0          | 1.3       | 2.3              | 2.2                | 4.5 | Not Listed               |
| 20           | Nelli           | <i>Embllica officinalis</i>  | Phyllanthaceae | 5                    | 4                               | 10                     | 0.5     | 40.0          | 1.3       | 2.9              | 2.9                | 5.8 | Not Listed               |
| 21           | Karuvelam maram | <i>Vachellia nilotica</i>    | Fabaceae       | 6                    | 5                               | 10                     | 0.6     | 50.0          | 1.2       | 3.5              | 3.6                | 7.1 | Not Listed               |
| 22           | Vadanarayani    | <i>Delonix elata</i>         | Fabaceae       | 4                    | 3                               | 10                     | 0.4     | 30.0          | 1.3       | 2.3              | 2.2                | 4.5 | Not Listed               |
| 23           | Marudaani       | <i>Lawsonia inermis</i>      | Lythraceae     | 7                    | 6                               | 10                     | 0.7     | 60.0          | 1.2       | 4.1              | 4.3                | 8.4 | Not Listed               |

|                                   |                  |                              |               |   |   |    |     |      |     |     |     |      |            |
|-----------------------------------|------------------|------------------------------|---------------|---|---|----|-----|------|-----|-----|-----|------|------------|
| 24                                | Pappali maram    | <i>Carica papaya L</i>       | Caricaceae    | 6 | 5 | 10 | 0.6 | 50.0 | 1.2 | 3.5 | 3.6 | 7.1  | Not Listed |
| 25                                | Nochi            | <i>Vitex negundo</i>         | Verbenaceae   | 5 | 4 | 10 | 0.5 | 40.0 | 1.3 | 2.9 | 2.9 | 5.8  | Not Listed |
| 26                                | Vilvam           | <i>Aegle marmelos</i>        | Rutaceae      | 4 | 3 | 10 | 0.4 | 30.0 | 1.3 | 2.3 | 2.2 | 4.5  | Not Listed |
| 27                                | Nuna maram       | <i>Morinda citrifolia</i>    | Rubiaceae     | 6 | 5 | 10 | 0.6 | 50.0 | 1.2 | 3.5 | 3.6 | 7.1  | Not Listed |
| 28                                | Koyya            | <i>Psidium guajava</i>       | Myrtaceae     | 7 | 6 | 10 | 0.7 | 60.0 | 1.2 | 4.1 | 4.3 | 8.4  | Not Listed |
| 29                                | Seethapazham     | <i>Annona reticulata</i>     | Annonaceae    | 6 | 5 | 10 | 0.6 | 50.0 | 1.2 | 3.5 | 3.6 | 7.1  | Not Listed |
| 30                                | Vagai            | <i>Albizia lebbbeck</i>      | Fabaceae      | 5 | 4 | 10 | 0.5 | 40.0 | 1.3 | 2.9 | 2.9 | 5.8  | Not Listed |
| 31                                | Teaku            | <i>Tectona grandis</i>       | Lamiaceae     | 6 | 5 | 10 | 0.6 | 50.0 | 1.2 | 3.5 | 3.6 | 7.1  | Not Listed |
| 32                                | Teanai Maram     | <i>Cocos nucifera</i>        | Arecaceae     | 3 | 2 | 10 | 0.3 | 20.0 | 1.5 | 1.8 | 1.4 | 3.2  | Not Listed |
| Shrubs                            |                  |                              |               |   |   |    |     |      |     |     |     |      |            |
| 33                                | Avarai           | <i>Senna auriculata</i>      | Fabaceae      | 8 | 7 | 15 | 0.5 | 46.7 | 1.1 | 7.6 | 7.7 | 15.3 | Not Listed |
| 34                                | Sundaika         | <i>Solanum torvum</i>        | Solanaceae    | 9 | 8 | 15 | 0.6 | 53.3 | 1.1 | 8.6 | 8.8 | 17.4 | Not Listed |
| 35                                | Arali            | <i>Nerium indicum</i>        | Apocynaceae   | 7 | 6 | 15 | 0.5 | 40.0 | 1.2 | 6.7 | 6.6 | 13.3 | Not Listed |
| 36                                | Idlipoo          | <i>Xorococ cineia</i>        | Rubiaceae     | 6 | 5 | 15 | 0.4 | 33.3 | 1.2 | 5.7 | 5.5 | 11.2 | Not Listed |
| 37                                | Neermulli        | <i>Hydrophila auriculata</i> | Acanthaceae   | 7 | 6 | 15 | 0.5 | 40.0 | 1.2 | 6.7 | 6.6 | 13.3 | Not Listed |
| 38                                | Icham            | <i>Phoenix pusilla</i>       | Arecaceae     | 8 | 7 | 15 | 0.5 | 46.7 | 1.1 | 7.6 | 7.7 | 15.3 | Not Listed |
| 39                                | Chaturakalli     | <i>Euphorbia antiquorum</i>  | Euphorbiaceae | 6 | 5 | 15 | 0.4 | 33.3 | 1.2 | 5.7 | 5.5 | 11.2 | Not Listed |
| 40                                | Kattamanakku     | <i>Jatropha curcas</i>       | Euphorbiaceae | 7 | 6 | 15 | 0.5 | 40.0 | 1.2 | 6.7 | 6.6 | 13.3 | Not Listed |
| 41                                | Thuthi           | <i>Abutilon indicum</i>      | Meliaceae     | 9 | 8 | 15 | 0.6 | 53.3 | 1.1 | 8.6 | 8.8 | 17.4 | Not Listed |
| 42                                | Chemparuthi      | <i>Hibiscu rosa-sinensis</i> | Malvaceae     | 8 | 7 | 15 | 0.5 | 46.7 | 1.1 | 7.6 | 7.7 | 15.3 | Not Listed |
| 43                                | Kundumani        | <i>Abrus precatorius</i>     | Fabaceae      | 6 | 5 | 15 | 0.4 | 33.3 | 1.2 | 5.7 | 5.5 | 11.2 | Not Listed |
| 44                                | Erukku           | <i>Calotropis gigantea</i>   | Apocynaceae   | 8 | 7 | 15 | 0.5 | 46.7 | 1.1 | 7.6 | 7.7 | 15.3 | Not Listed |
| 45                                | Bulangan         | <i>Gmelina asiatica L.</i>   | Lamiaceae     | 9 | 8 | 15 | 0.6 | 53.3 | 1.1 | 8.6 | 8.8 | 17.4 | Not Listed |
| 46                                | mottled spurge   | <i>Euphorbia lactea</i>      | Euphorbiaceae | 7 | 6 | 15 | 0.5 | 40.0 | 1.2 | 6.7 | 6.6 | 13.3 | Not Listed |
| Herbs, Climber, Creeper & Grasses |                  |                              |               |   |   |    |     |      |     |     |     |      |            |
| 47                                | Nayuruv          | <i>Achyranthes aspera</i>    | Amaranthaceae | 6 | 5 | 20 | 0.3 | 25.0 | 1.2 | 2.1 | 2.0 | 4.1  | Not Listed |
| 48                                | Vetukaayapoondur | <i>Tridax procumbens</i>     | Asteraceae    | 7 | 6 | 20 | 0.4 | 30.0 | 1.2 | 2.5 | 2.4 | 4.9  | Not Listed |
| 49                                | Koraikkilangu    | <i>Cyperus articulatus</i>   | Cyperaceae    | 8 | 7 | 20 | 0.4 | 35.0 | 1.1 | 2.8 | 2.8 | 5.6  | Not Listed |
| 50                                | Kuppaimeni       | <i>Acalypha indica</i>       | Euphorbiaceae | 9 | 8 | 20 | 0.5 | 40.0 | 1.1 | 3.2 | 3.2 | 6.4  | Not Listed |
| 51                                | Manjal           | <i>Curcuma longa</i>         | Zingiberaceae | 7 | 6 | 20 | 0.4 | 30.0 | 1.2 | 2.5 | 2.4 | 4.9  | Not Listed |
| 52                                | Chempu           | <i>Colocasia indica</i>      | Araceae       | 8 | 7 | 20 | 0.4 | 35.0 | 1.1 | 2.8 | 2.8 | 5.6  | Not Listed |
| 53                                | Karisilanganni   | <i>Eclipta prostrata</i>     | Asteraceae    | 9 | 8 | 20 | 0.5 | 40.0 | 1.1 | 3.2 | 3.2 | 6.4  | Not Listed |
| 54                                | Korai            | <i>Cyperus rotundus</i>      | Cyperaceae    | 6 | 5 | 20 | 0.3 | 25.0 | 1.2 | 2.1 | 2.0 | 4.1  | Not Listed |
| 55                                | Kunnakora        | <i>Cyperus compressus</i>    | Cyperaceae    | 7 | 6 | 20 | 0.4 | 30.0 | 1.2 | 2.5 | 2.4 | 4.9  | Not Listed |

|    |                  |                                  |                |    |    |    |     |      |     |     |     |     |            |
|----|------------------|----------------------------------|----------------|----|----|----|-----|------|-----|-----|-----|-----|------------|
| 56 | Milagai          | <i>Capsicum frutescens</i>       | Solanaceae     | 6  | 5  | 20 | 0.3 | 25.0 | 1.2 | 2.1 | 2.0 | 4.1 | Not Listed |
| 57 | Kanamvazha       | <i>Commelina benghalensis</i>    | Commelinaceae  | 7  | 6  | 20 | 0.4 | 30.0 | 1.2 | 2.5 | 2.4 | 4.9 | Not Listed |
| 58 | Nai kadugu       | <i>Celome viscosa</i>            | Capparidaceae  | 8  | 7  | 20 | 0.4 | 35.0 | 1.1 | 2.8 | 2.8 | 5.6 | Not Listed |
| 59 | Thumbai          | <i>Leucas aspera</i>             | Lamiaceae      | 9  | 8  | 20 | 0.5 | 40.0 | 1.1 | 3.2 | 3.2 | 6.4 | Not Listed |
| 60 | Parttiniyam      | <i>Parthenium hysterophorus</i>  | Asteraceae     | 6  | 5  | 20 | 0.3 | 25.0 | 1.2 | 2.1 | 2.0 | 4.1 | Not Listed |
| 61 | Mukurattai       | <i>Boerhavia diffusa</i>         | Nyctaginaceae  | 7  | 6  | 20 | 0.4 | 30.0 | 1.2 | 2.5 | 2.4 | 4.9 | Not Listed |
| 62 | Thulasi          | <i>Ocimum tenuiflorum</i>        | Lamiaceae      | 11 | 10 | 20 | 0.6 | 50.0 | 1.1 | 3.9 | 4.0 | 7.9 | Not Listed |
| 63 | Manathakkali     | <i>Solanumnigrum</i>             | Solanaceae     | 7  | 8  | 20 | 0.4 | 40.0 | 0.9 | 2.5 | 3.2 | 5.7 | Not Listed |
| 64 | Kumipoondur      | <i>Gomphrena celosioides</i>     | Amaranthaceae  | 6  | 5  | 20 | 0.3 | 25.0 | 1.2 | 2.1 | 2.0 | 4.1 | Not Listed |
| 65 | Kattuthulasi     | <i>Ocimum sanctum</i>            | Lamiaceae      | 10 | 9  | 20 | 0.5 | 45.0 | 1.1 | 3.5 | 3.6 | 7.1 | Not Listed |
| 66 | Kovai            | <i>Coccinia grandis</i>          | Cucurbitaceae  | 7  | 6  | 20 | 0.4 | 30.0 | 1.2 | 2.5 | 2.4 | 4.9 | Not Listed |
| 67 | Perandai         | <i>Cissus quadrangularis</i>     | Vitaceae       | 9  | 8  | 20 | 0.5 | 40.0 | 1.1 | 3.2 | 3.2 | 6.4 | Not Listed |
| 68 | Mudakkotan       | <i>Cardiospermum helicacabum</i> | Sapindaceae    | 8  | 7  | 20 | 0.4 | 35.0 | 1.1 | 2.8 | 2.8 | 5.6 | Not Listed |
| 69 | Karkakartum      | <i>Clitoria ternatea</i>         | Fabaceae       | 7  | 6  | 20 | 0.4 | 30.0 | 1.2 | 2.5 | 2.4 | 4.9 | Not Listed |
| 70 | Nannari          | <i>Hemidesmus indicus</i>        | Asclepiadaceae | 6  | 5  | 20 | 0.3 | 25.0 | 1.2 | 2.1 | 2.0 | 4.1 | Not Listed |
| 71 | Kovakkai         | <i>Trichosanthes dioica</i>      | Cucurbitaceae  | 8  | 7  | 20 | 0.4 | 35.0 | 1.1 | 2.8 | 2.8 | 5.6 | Not Listed |
| 72 | Malli            | <i>Jasminum augustifolium</i>    | Oleaceae       | 6  | 5  | 20 | 0.3 | 25.0 | 1.2 | 2.1 | 2.0 | 4.1 | Not Listed |
| 73 | Musumusukkai     | <i>Mukia maderaspatana</i>       | Cucurbitaceae  | 7  | 6  | 20 | 0.4 | 30.0 | 1.2 | 2.5 | 2.4 | 4.9 | Not Listed |
| 74 | Mosukkattan      | <i>Passiflora foetida</i>        | Passifloraceae | 6  | 5  | 20 | 0.3 | 25.0 | 1.2 | 2.1 | 2.0 | 4.1 | Not Listed |
| 75 | Vallikeerai      | <i>Ipomoea aquatica</i>          | Convolvulaceae | 8  | 7  | 20 | 0.4 | 35.0 | 1.1 | 2.8 | 2.8 | 5.6 | Not Listed |
| 76 | Siru puladi      | <i>Desmodium triflorum</i>       | Fabaceae       | 9  | 8  | 20 | 0.5 | 40.0 | 1.1 | 3.2 | 3.2 | 6.4 | Not Listed |
| 77 | Sithrapaalavi    | <i>Euphorbia prostrata</i>       | Euphorbiaceae  | 8  | 7  | 20 | 0.4 | 35.0 | 1.1 | 2.8 | 2.8 | 5.6 | Not Listed |
| 78 | Korai            | <i>Cyperus rotandus</i>          | Poaceae        | 6  | 5  | 20 | 0.3 | 25.0 | 1.2 | 2.1 | 2.0 | 4.1 | Not Listed |
| 79 | mookuthi poondur | <i>Wedelia trilobata</i>         | Asteraceae     | 7  | 6  | 20 | 0.4 | 30.0 | 1.2 | 2.5 | 2.4 | 4.9 | Not Listed |
| 80 | Nellu            | <i>Oryza sativa</i>              | Poaceae        | 9  | 8  | 20 | 0.5 | 40.0 | 1.1 | 3.2 | 3.2 | 6.4 | Not Listed |
| 81 | Pullu            | <i>Eragrostis ferruginea</i>     | Poaceae        | 12 | 11 | 20 | 0.6 | 55.0 | 1.1 | 4.2 | 4.4 | 8.6 | Not Listed |
| 82 | Chevvarakupul    | <i>Chloris barbata</i>           | Amaranthaceae  | 8  | 7  | 20 | 0.4 | 35.0 | 1.1 | 2.8 | 2.8 | 5.6 | Not Listed |
| 83 | Arugampul        | <i>Cynodon dactylon</i>          | Poaceae        | 13 | 12 | 20 | 0.7 | 60.0 | 1.1 | 4.6 | 4.8 | 9.4 | Not Listed |
| 84 | Sapathikalli     | <i>Opuntia dillenii</i>          | Cactaceae      | 9  | 8  | 20 | 0.5 | 40.0 | 1.1 | 3.2 | 3.2 | 6.4 | Not Listed |

### 3.5.2 Fauna

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

**Table 3.23 Methodology applied during survey of fauna**

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

The fauna is studied for 10 km radius around the project site. Project site and 2 km around the project site is considered as core zone and from 2 km to 10 km radius, it is considered as buffer zone.

#### ***Fauna Composition in the Core Zone***

A total of 22 species belonging to 15 families were observed in the core zone (Table3.24). Among them are 9 species of Insects, 3 species of Reptiles, 1 species of Mammals, and 9 species of Avian. None of these species are threatened or endemic in the study area and surroundings. There are no Schedule I species and 8 species are under schedule IV according to Indian wild life Act, 1972. There are no critically endangered, endangered, vulnerable and endemic species in the core zone.

#### ***Fauna Composition in the Buffer Zone***

A total of 44 species belonging to 34 families were recorded from the buffer area. Among them were 20 species of Birds, 13 species of Insects, 3 species of Reptiles, 1 species of Mammals, and 9 species of Amphibians, as mentioned in Table.3.25. There are four species under Schedule II and twenty-six species under schedule IV according to Indian wild life Act 1972. And there are no critically endangered, vulnerable and endemic species in the buffer area. There is no schedule I Species in study area and there are no critically endangered, endangered, vulnerable and endemic species.



**Table 3.24 Fauna in the Core zone**

| S. No.   | Common name/EnglishName | FamilyName     | Scientific Name               | Schedule List Wildlife Protection Act, 1972 | IUCN Red List data |
|----------|-------------------------|----------------|-------------------------------|---------------------------------------------|--------------------|
| INSECTS  |                         |                |                               |                                             |                    |
| 1        | Common Tiger            | Nymphalidae    | <i>Danaus genutia</i>         | NL                                          | NL                 |
| 2        | Red-veined darter       | Libellulidae   | <i>Sympetrum fonscolombii</i> | NL                                          | LC                 |
| 3        | Grasshopper             | Acrididae      | <i>Hieroglyphus sp</i>        | NL                                          | LC                 |
| 4        | Blue tiger              | Nymphalidae    | <i>Tirumala limniace</i>      | Schedule IV                                 | LC                 |
| 5        | Stick insect            | Lonchodidae    | <i>carausius morosus</i>      | NL                                          | LC                 |
| 6        | Mottled emigrant        | Peridae        | <i>Catopsilia pyranthe</i>    | NL                                          | LC                 |
| 7        | Praying mantis          | Mantidae       | <i>Mantis religiosa</i>       | NL                                          | NL                 |
| 8        | Striped tiger           | Nymphalidae    | <i>Danaus plexippus</i>       | Schedule IV                                 | LC                 |
| 9        | Acraea violae           | Nymphalidae    | <i>Acraea violae</i>          | NL                                          | LC                 |
| REPTILES |                         |                |                               |                                             |                    |
| 10       | Garden lizard           | Agamidae       | <i>Calotes versicolor</i>     | NL                                          | LC                 |
| 11       | Common house gecko      | Gekkonidae     | <i>Hemidactylus frenatus</i>  | NL                                          | LC                 |
| 12       | Fan-Throated Lizard     | Agamidae       | <i>Sitanaponticeriana</i>     | NL                                          | LC                 |
| MAMMALS  |                         |                |                               |                                             |                    |
| 1        | Indian Field Mouse      | <i>Muridae</i> | <i>Mus booduga</i>            | Schedule IV                                 | NL                 |
| AVES     |                         |                |                               |                                             |                    |
| 1        | Green bee-eater         | Meropidae      | <i>Merops orientalis</i>      | NL                                          | LC                 |
| 2        | Koel                    | Cuculidae      | <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                    | Cuculidae      | <i>Eudynamys scolopaceus</i>  | Schedule IV                                 | LC                 |
| 7        | Crow Pheasant           | Cuculidae      | <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                 |

**Table 3.25 Fauna in the 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               | Tawny costar             | Nymphalidae    | <i>Danaus chrysippus</i>      | Schedule IV                                | LC                 |
| 2               | Milkweed butterfly       | Nymphalidae    | <i>Danainae</i>               | NL                                         | LC                 |
| 3               | Blue tiger               | Nymphalidae    | <i>Tirumala limniace</i>      | Schedule IV                                | LC                 |
| 4               | Common Indian Crow       | Nymphalidae    | <i>Euploea core</i>           | Schedule IV                                | LC                 |
| 5               | Green marsh hawk         | Libellulidae   | <i>Orthetrum sabina</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               | Ant                      | Formicidae     | <i>Camponotus Vicinus</i>     | NL                                         | NL                 |
| 9               | Red-veined darter        | Libellulidae   | <i>Sympetrum fonscolombii</i> | NL                                         | LC                 |
| 10              | Lesser grass blue        | Lycaenidae     | <i>Zizina otis indica</i>     | Schedule IV                                | LC                 |
| 11              | Praying mantis           | Mantidae       | <i>mantis religiosa</i>       | NL                                         | NL                 |
| 12              | Grasshopper              | Acrididae      | <i>Hieroglyphus sp</i>        | NL                                         | LC                 |
| 13              | Common Tiger             | Nymphalidae    | <i>Danaus genutia</i>         | Schedule IV                                | LC                 |
| <b>REPTILES</b> |                          |                |                               |                                            |                    |
| 1               | Chameleon                | Chamaeleonidae | <i>Chameleonzeylanicus</i>    | Sch II (Part II)                           | LC                 |
| 2               | Garden lizard            | Agamidae       | <i>Calotes versicolor</i>     | NL                                         | LC                 |
| 3               | Green Vine snake         | Colubridae     | <i>Ahaetulla nasuta</i>       | Schedule IV                                | LC                 |
| 4               | Common house gecko       | Gekkonidae     | <i>Hemidactylus frenatus</i>  | NL                                         | LC                 |
| 5               | Rat snake                | Colubridae     | <i>Ptyas mucosa</i>           | Sch II (Part II)                           | LC                 |
| <b>MAMMALS</b>  |                          |                |                               |                                            |                    |
| 1               | palmsquirrel             | Sciuridae      | <i>Funambulus palmarum</i>    | Schedule IV                                | LC                 |
| 2               | Indian FieldMouse        | Muridae        | <i>Mus booduga</i>            | Schedule IV                                | LC                 |
| 3               | Home mouse               | Muridae        | <i>Mus musculus tyleri</i>    | NL                                         | LC                 |
| <b>AVES</b>     |                          |                |                               |                                            |                    |
| 1               | House crow               | Corvidae       | <i>Corvus splendens</i>       | NL                                         | LC                 |
| 2               | Cattle egret             | Ardeidae       | <i>Bubulcus ibis</i>          | NL                                         | LC                 |
| 3               | Black drongo             | Dicruridae     | <i>Dicrurus macrocercus</i>   | Schedule IV                                | LC                 |
| 4               | Red-vented Bulbul        | Pycnonotidae   | <i>Pycnonotus cafer</i>       | Schedule IV                                | LC                 |
| 5               | Indian pond heron        | Ardeidae       | <i>Ardeola grayii</i>         | Schedule IV                                | LC                 |
| 6               | green bee-eater          | Meropidae      | <i>Merops orientalis</i>      | NL                                         | LC                 |
| 7               | Small Sunbird            | Nectariniidae  | <i>Nectarinia asiatica</i>    | Schedule IV                                | LC                 |
| 8               | Common myna              | Sturnidae      | <i>Acridotheres tristis</i>   | NL                                         | LC                 |
| 9               | Blue Rock Pigeon         | Columbidae     | <i>Columba livia</i>          | Schedule IV                                | LC                 |
| 10              | Common Coot              | Rallidae       | <i>Fulica atra</i>            | Schedule IV                                | LC                 |
| 11              | Small Sunbird            | Nectariniidae  | <i>Nectarinia asiatica</i>    | Schedule IV                                | LC                 |

### 3.5.3 Aquatic Vegetation

The field survey for assessing the aquatic vegetation was also undertaken during the study period. The list of aquatic plants observed in the study area is given in table 3.26.

**Table 3.26 Aquatic Vegetation**

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

\*Lc- Least Concern, Na-Not Yet Assessed

### **Food chain**

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

Ex: Phytoplankton → Zooplankton → small fish → large fish

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

There are no rare, endangered and endemic species found in the study area

### 3.5.4 Agriculture & Horticulture in Tiruvannamalai district

The pre-monsoon rainfall is almost uniform throughout the district. The coastal taluks get more rains rather than the interior regions. This district is mainly depending on the seasonal rains, the distress conditions prevail in the event of the failure of rains. Northeast and Southwest monsoon are the major donors with 54% and 36% contribution each to the total annual rainfall. Agriculture is the main occupation of the people with 20% of the population engaged in it. Paddy is the major crop cultivated in this district. Groundnuts, Sugarcane, Cereals and Millets and Pulses are the other major crops. Paddy is the major crop cultivated in this district. Groundnuts, Sugarcane, Cereals & Millets and Pulses are the other major crops cultivated.

#### 3.5.4.1 Major Agricultural Crops 1km radius

Major horticulture crops cultivated in this district are vegetables crops like tomato, brinjal, chillies, onion and turmeric. Details of major field crops and horticulture in 1km radius is given in Table. 3.27.

**Table 3.27 Major Crops in 1km radius**

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

**3.5.4.2 Major Horticulture Crops 1km radius**

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

**3.5.4.3 Horticulture 1km radius**

Major horticulture crops cultivated in Tiruvannamalai district are fruit crops like mango, banana, Sapota and guava, vegetables like tomato, brinjal, Veandai, chillies, onion and tapioca, spices like turmeric. Details of major field crops and horticulture cultivation in 1km radius is given in Table 3.28.

**Table 3.28 Major Field Crops & Horticulture cultivation in 1km radius.**

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

**Results**

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

Hence, this small mining operation over short period of time will not have any significant impact on the surrounding flora and fauna.

### **3.6 SOCIO-ECONOMIC ENVIRONMENT**

The major developmental activities of the mining and industrial sector are crucial for economic development and the creation of direct and indirect employment opportunities. These activities also fulfil society's basic and modern needs of the society, ultimately improving the quality of life through advancements in social, economic, health, education, and nutritional status within the project region, state, and country. In this manner all developmental projects have direct as well as indirect relationships with socioeconomic aspects, which also include public acceptability for developmental projects. Thus, the study of socio-economic environment component incorporating various sides related to prevailing social and cultural conditions and economic status of the rough stone mining quarries project region is an important part of the EIA study. The study of these parameters helps in identification, prediction and evaluation of the likely impacts on the socio-economics and parameters of human interest due to the project.

#### **3.6.1 Objectives of the Study**

*The objectives of the socio-economic impact assessment are as follows:*

- a) To study the socio-economic status of the people living in the study area of the project.
- b) To identify the basic needs of the nearby villages within the study area.
- c) To assess the impact on socio-economic environment due to the project.
- d) To provide the employment and improved living standards.
- e) To analysis of impact of socio economic and Environmental Infrastructure facilities and road accessibility.

#### **3.6.2 Methodology**

The study employed cluster sampling to outline two zones around the proposed project site: Zone 1 (Core Zone, 0-1 km radius) and Zone 2 (Low Impact Zone, 1–5 km radius). The primary data collection was conducted through structured interviews, field observation, and focus group discussions with the local people of in Kundiyathandalam and Poonathangal Village, Vembakkam Taluk, Tiruvannamalai District, Tamil Nadu. The secondary data were collected from the Census report 2011 and official records, covering demographics and basic services including information on population, number of households, literacy rates, sex ratios, worker details and the availability of basic services. This study covers the positive and negative impacts of the project's establishment, and provides recommendations for analysing and mitigating adverse effects. The study areas are illustrated in Figure 3.29.

### **3.6.3 Demographic Profile of Tiruvannamalai District**

Tiruvannamalai District is geographically bounded by Vellore and Ranipet districts to the north, Tirupathur district to the west, Kallakurichi district to the south, Chengalpattu district to the east, Villupuram district to the southeast, and Kanchipuram district to the northeast. Administratively, the district is divided into 12 taluks, which are further subdivided into 18 blocks, comprising a total of 860 villages. According to the 2011 Census, Tiruvannamalai District had a total population of 2,464,875, of which 1,235,889 were males and 1,228,986 were females respectively. In comparison, the 2001 Census recorded a population of 2,186,125, including 1,095,859 males and 1,090,266 females, indicating a significant population growth over the decade. This indicates a population growth of approximately 12.8 percent over the decade, reflecting steady demographic expansion in the district.

The average literacy rate of the district in 2011 was 84.41%, with male literacy at 90.80% and female literacy at 78.13%. In terms of the number of literates, there were 1,626,813 literate individuals, comprising 909,803 males and 717,010 females. However, gender disparities in education remain evident, as the male and female literacy rates stood at 81.18% and 62.05%, respectively. The sex ratio in Tiruvannamalai District was 994 females per 1000 males in 2011, showing a marginal decline from 995 in 2001, yet remaining considerably higher than the national average of 940. The child sex ratio was 930 girls per 1000 boys in 2011, reflecting a decrease from 948 in 2001, suggesting a continuing gender imbalance among the child population. The demographic characteristics of Tiruvannamalai District reflect moderate population growth, improving literacy levels, and a relatively balanced adult sex ratio, though the decline in the child sex ratio highlights the need for sustained gender-sensitive interventions and continued focus on educational equity and social awareness.

Source: <https://www.census2011.co.in/census/district/26-tiruvannamalai.html>

### **3.6.4 Profile of Study Area - Kundiyanthandalam and Poonathangal Village**

Kundiyanthandalam and Poonathangal are medium-sized villages located in Cheyyar Taluka of Tiruvannamalai District, Tamil Nadu. As per the 2011 Census, Kundiyanthandalam comprises 170 households with a total population of 703 (351 males and 352 females), while Poonathangal consists of 80 households with 277 residents (132 males and 145 females). The proportion of children aged 0–6 years is 10.10% in Kundiyanthandalam and 11.91% in Poonathangal. The average sex ratio is 1003 in Kundiyanthandalam and 1098 in Poonathangal, both higher than the Tamil Nadu state average of 996. Similarly, the child sex ratio is 972 and 1200 respectively, exceeding the state average of 943. In terms of literacy, Kundiyanthandalam records a rate of 74.68% (male 83.17%, female 66.25%), which is lower than the state average

of 80.09%, while Poonathangal exhibits a higher literacy rate of 85.66% (male 95.73%, female 76.38%). Social composition data indicate that Scheduled Castes constitute 54.20% of the population in Kundiyanthandalam, whereas there is no Scheduled Caste or Scheduled Tribe population in Poonathangal. Finally, Poonathangal demonstrates better literacy levels and gender balance, while Kundiyanthandalam has a larger population with a significant Scheduled Caste presence. The profile of study area includes demographic details such as the number of households, population statistics, literacy levels, child population (0–6 years), caste composition, and workforce, as presented in Table 3.29.

**Table. 3.29 Demographic Status of Kundiyanthandalam and Poonathangal Villages**

| Particulars         | Kundiyanthandalam |         |         | Poonathangal |         |         |
|---------------------|-------------------|---------|---------|--------------|---------|---------|
|                     | Total             | Male    | Female  | Total        | Male    | Female  |
| Total No. of Houses | 170               | -       | -       | 80           | -       | -       |
| Population          | 703               | 351     | 352     | 277          | 132     | 145     |
| Child (0-6)         | 71                | 36      | 35      | 33           | 15      | 18      |
| Schedule Caste      | 381               | 182     | 199     | 0            | 0       | 0       |
| Schedule Tribe      | 0                 | 0       | 0       | 0            | 0       | 0       |
| Literacy            | 74.68 %           | 83.17 % | 66.25 % | 85.66 %      | 95.73 % | 76.38 % |
| Total Workers       | 254               | 200     | 54      | 108          | 89      | 19      |
| Main Worker         | 97                | -       | -       | 99           | -       | -       |
| Marginal Worker     | 157               | 124     | 33      | 9            | 7       | 2       |

Source: <https://www.census2011.co.in/data/village/631258-poonathangal-tamil-nadu.html>

### 3.6.5 Workforce Participation in the study area

Workforce participation patterns in the study villages reveal notable differences in the nature and extent of employment. In Kundiyanthandalam village, a total of 254 individuals from were engaged in economic activities. Of these, 38.19% were classified as main workers those employed or earning for more than six months during the reference period while a higher proportion (61.81%) were involved in marginal work, indicating irregular or seasonal employment lasting less than six months. Among the main workers, 4 individuals were identified as cultivators (owners or co-owners of land), and 2 individuals were engaged as agricultural labourers, suggesting limited participation in agriculture-based occupations.

In contrast, Poonathangal village exhibited a stronger engagement in stable employment. Out of 108 working individuals, a substantial 91.67% were categorized as main workers, with only 8.33% involved in marginal work. Among the main workers, 13 were cultivators (owners or co-owners) and 44 were agricultural labourers, reflecting a greater dependency on agriculture compared to Kundiyanthandalam village. The analysis indicates a higher proportion of stable and agriculture-based employment in Poonathangal, whereas Kundiyanthandalam demonstrates

a predominance of marginal and possibly non-agricultural or seasonal employment. These differences may reflect variations in local resource availability, land ownership patterns, and access to non-farm employment opportunities.

***Project Benefits:***

The local people have been provided with either direct employments or indirect employment such as business, contract works and development work like roads, etc. and other welfare amenities such as medical facilities, conveyance, free education, drinking water supply etc. The number of villages and human settlements within a radius of 5 km from the project site along with population, their education level etc.

Table 3.30 presents detailed demographic, social, and economic indicators for villages in the study area. The study area comprises 43 villages, with total population of these villages varies considerably, ranging from small settlements such as Dharmacheri (34 residents) and Poonathangal (120 residents) to larger villages like Thenambakkam (4722 residents) and Orikkai (2310 residents). Children aged 0–6 generally account for approximately 8–12% of the total population, indicating a relatively young demographic profile in most villages.

Literacy levels show notable variation across the villages. Larger villages such as Thenambakkam, Magaral, and Elacheri exhibit high numbers of literates, whereas smaller villages such as Poonathangal, Girijapuram, and Dharmacheri report lower literacy levels, reflecting both population size and access to educational facilities. Male literacy consistently exceeds female literacy across the dataset, highlighting ongoing gender disparities in educational attainment.

Workforce participation also varies widely. In larger villages such as Thenambakkam (2789 male workers; 1269 female workers) and Magaral (758 male; 637 female), a significant proportion of the population is engaged in work activities, whereas smaller villages like Dharmacheri and Poonathangal have fewer workers. Across most villages, male workforce participation surpasses female participation, reflecting prevailing social norms and gender-based constraints on employment. The study findings revealed that considerable heterogeneity among the villages in terms of population size, literacy, workforce engagement, and social composition. However, gender disparities in education and employment underscore the need for targeted interventions to enhance female literacy and economic participation. Additionally, the concentration of SC populations in certain villages highlights the importance of caste-sensitive development policies to promote social and economic inclusivity.



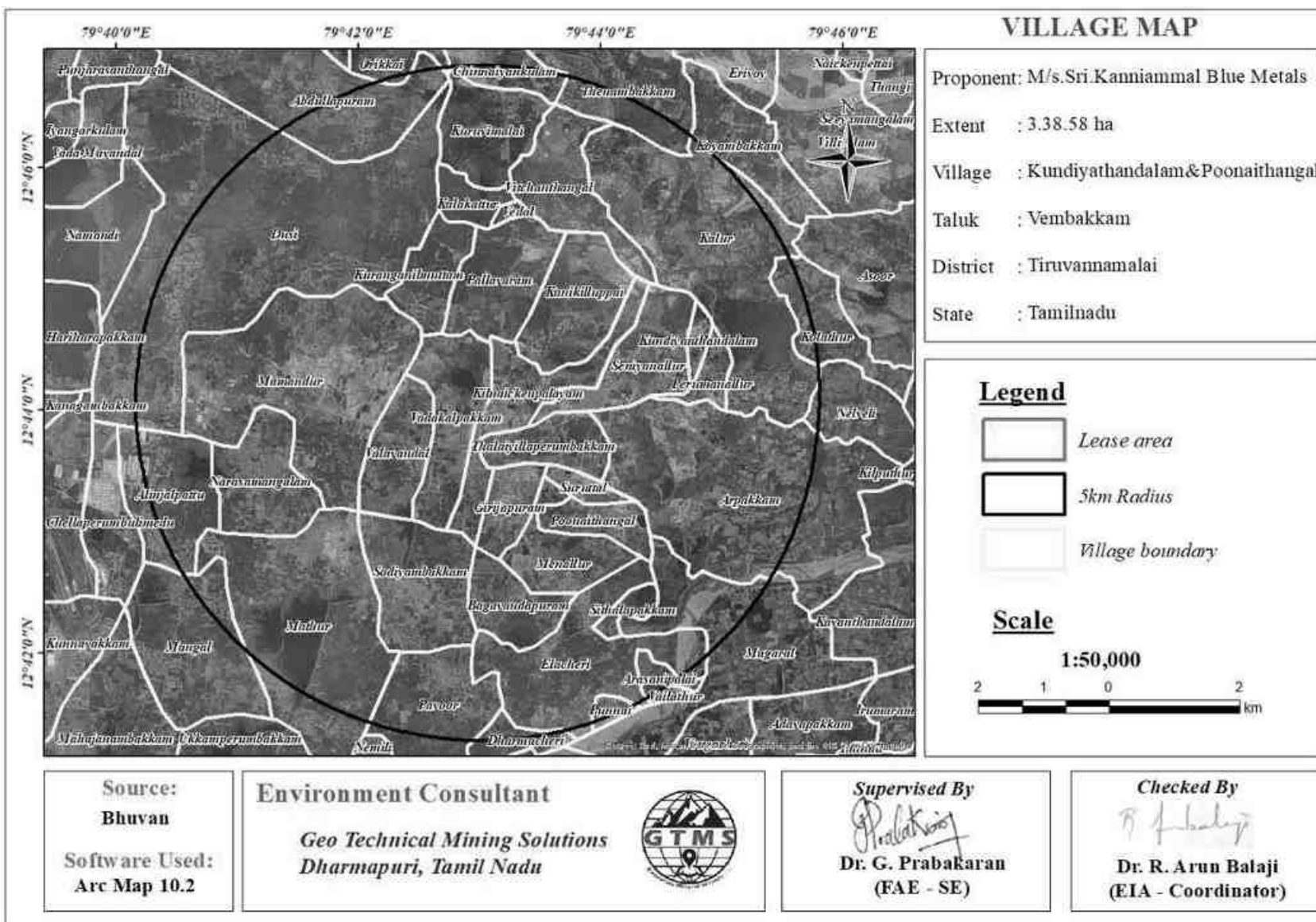


Figure 3.29 Details Village Boundaries within 1 km and 5 km Radius of the Project Lease Area

**Table 3.30 Demographic Structure and Literacy Rate of the villages (5 km radius)**

| Village Name      | No. of Houses | Total Population |        | Child (0-6) |        | Schedule Caste |        | Schedule Tribe |        | No of Literates |        | Total Workers |        |
|-------------------|---------------|------------------|--------|-------------|--------|----------------|--------|----------------|--------|-----------------|--------|---------------|--------|
|                   |               | Male             | Female | Male        | Female | Male           | Female | Male           | Female | Male            | Female | Male          | Female |
| Orikkai           | 1020          | 2310             | 2297   | 267         | 262    | 416            | 459    | 35             | 31     | 1709            | 1378   | 1469          | 742    |
| Chinnaiyankulam   | 282           | 615              | 684    | 83          | 90     | 243            | 253    | 8              | 5      | 410             | 372    | 355           | 165    |
| Thenambakkam      | 2090          | 4722             | 4635   | 587         | 550    | 709            | 700    | 97             | 102    | 3347            | 2604   | 2789          | 1269   |
| Abdullapuram      | 456           | 1062             | 1016   | 145         | 150    | 155            | 161    | 0              | 0      | 797             | 592    | 657           | 410    |
| Koyambakkam       | 49            | 120              | 108    | 16          | 14     | 0              | 0      | 0              | 0      | 72              | 49     | 67            | 49     |
| Dusi              | 1106          | 2570             | 2546   | 367         | 351    | 43             | 27     | 37             | 28     | 1799            | 1221   | 1637          | 1221   |
| Kuruvimalai       | 312           | 649              | 651    | 84          | 77     | 13             | 12     | 21             | 19     | 440             | 325    | 412           | 172    |
| Vitchanthangal    | 200           | 414              | 414    | 47          | 51     | 157            | 144    | 3              | 3      | 267             | 173    | 256           | 159    |
| Kalur             | 653           | 1470             | 1440   | 218         | 194    | 248            | 269    | 0              | 2      | 949             | 569    | 927           | 671    |
| Kalakattur        | 330           | 714              | 703    | 76          | 98     | 0              | 0      | 0              | 0      | 436             | 300    | 460           | 347    |
| Vedal             | 169           | 386              | 364    | 68          | 52     | 3              | 2      | 16             | 16     | 184             | 133    | 240           | 180    |
| Kuranganilmuttam  | 133           | 337              | 304    | 31          | 32     | 267            | 234    | 0              | 0      | 272             | 172    | 215           | 118    |
| Pallavaram        | 387           | 865              | 825    | 109         | 106    | 188            | 183    | 26             | 20     | 579             | 341    | 513           | 362    |
| Kanikilluppai     | 169           | 389              | 393    | 45          | 45     | 307            | 314    | 0              | 0      | 283             | 223    | 246           | 130    |
| Kolathur          | 75            | 175              | 175    | 19          | 27     | 175            | 175    | 0              | 0      | 120             | 84     | 101           | 89     |
| Kilnaickenpalayam | 150           | 315              | 318    | 38          | 29     | 166            | 157    | 0              | 0      | 244             | 192    | 195           | 134    |
| Seniyanallur      | 103           | 234              | 247    | 22          | 27     | 0              | 0      | 0              | 0      | 199             | 114    | 144           | 114    |
| Mamandur          | 847           | 2022             | 1983   | 261         | 263    | 191            | 169    | 20             | 18     | 1506            | 990    | 1233          | 770    |
| Kundiyanthandalam | 170           | 364              | 351    | 39          | 42     | 185            | 174    | 0              | 0      | 273             | 173    | 215           | 133    |
| Perumanallur      | 85            | 172              | 188    | 24          | 27     | 3              | 6      | 3              | 5      | 121             | 90     | 99            | 78     |

|                        |     |      |      |     |     |     |     |     |    |     |     |     |     |
|------------------------|-----|------|------|-----|-----|-----|-----|-----|----|-----|-----|-----|-----|
| Vadakalpakkam          | 280 | 639  | 577  | 75  | 56  | 310 | 280 | 3   | 3  | 527 | 373 | 395 | 328 |
| Nelveli                | 134 | 301  | 277  | 45  | 38  | 247 | 214 | 0   | 0  | 132 | 91  | 172 | 118 |
| Valavandal             | 84  | 171  | 183  | 24  | 26  | 33  | 26  | 0   | 0  | 119 | 93  | 110 | 101 |
| Arpakkam               | 599 | 1328 | 1304 | 203 | 203 | 708 | 716 | 107 | 90 | 775 | 454 | 738 | 502 |
| Narasamangalam         | 300 | 781  | 766  | 109 | 118 | 4   | 3   | 24  | 22 | 536 | 327 | 431 | 297 |
| Thalaiyillaperumbakkam | 87  | 163  | 178  | 22  | 23  | 0   | 0   | 54  | 52 | 89  | 73  | 102 | 51  |
| Alinjalpattu           | 188 | 431  | 448  | 72  | 69  | 124 | 137 | 0   | 0  | 338 | 299 | 249 | 184 |
| Girijapuram            | 56  | 110  | 109  | 15  | 7   | 0   | 0   | 0   | 0  | 91  | 90  | 61  | 77  |
| Suruttal               | 272 | 635  | 606  | 73  | 62  | 8   | 5   | 0   | 0  | 531 | 358 | 366 | 248 |
| Menallur               | 307 | 610  | 642  | 72  | 80  | 298 | 278 | 0   | 0  | 444 | 357 | 394 | 318 |
| Poonaitthangal         | 72  | 120  | 120  | 15  | 8   | 0   | 0   | 0   | 0  | 102 | 66  | 71  | 24  |
| Mathur                 | 395 | 1010 | 962  | 132 | 113 | 111 | 99  | 0   | 0  | 676 | 395 | 576 | 411 |
| Sodiyambakkam          | 256 | 602  | 573  | 69  | 57  | 176 | 157 | 0   | 0  | 444 | 279 | 334 | 213 |
| Magaral                | 590 | 1234 | 1279 | 196 | 168 | 780 | 773 | 21  | 23 | 757 | 591 | 758 | 637 |
| Bagavandapuram         | 152 | 360  | 349  | 45  | 38  | 1   | 3   | 0   | 0  | 232 | 152 | 213 | 133 |
| Mangal                 | 173 | 359  | 374  | 55  | 55  | 170 | 164 | 14  | 12 | 235 | 171 | 197 | 163 |
| Elacheri               | 429 | 1010 | 953  | 129 | 106 | 377 | 333 | 0   | 0  | 627 | 375 | 574 | 466 |
| Sithalapakkam          | 128 | 284  | 283  | 43  | 43  | 12  | 17  | 0   | 0  | 140 | 64  | 173 | 37  |
| Pavoor                 | 270 | 602  | 639  | 90  | 81  | 449 | 469 | 0   | 0  | 389 | 328 | 362 | 345 |
| Arasanipalai           | 227 | 514  | 481  | 80  | 66  | 174 | 148 | 0   | 0  | 272 | 134 | 324 | 313 |
| Vailathur              | 107 | 244  | 241  | 31  | 34  | 163 | 158 | 0   | 0  | 156 | 109 | 141 | 113 |
| Punnai                 | 158 | 352  | 335  | 54  | 46  | 123 | 121 | 0   | 3  | 221 | 128 | 206 | 166 |
| Dharmacheri            | 12  | 13   | 21   | 1   | 1   | 0   | 0   | 0   | 0  | 5   | 3   | 8   | 8   |

Source: <https://censusindia.gov.in/nada/index.php/catalog/45345>

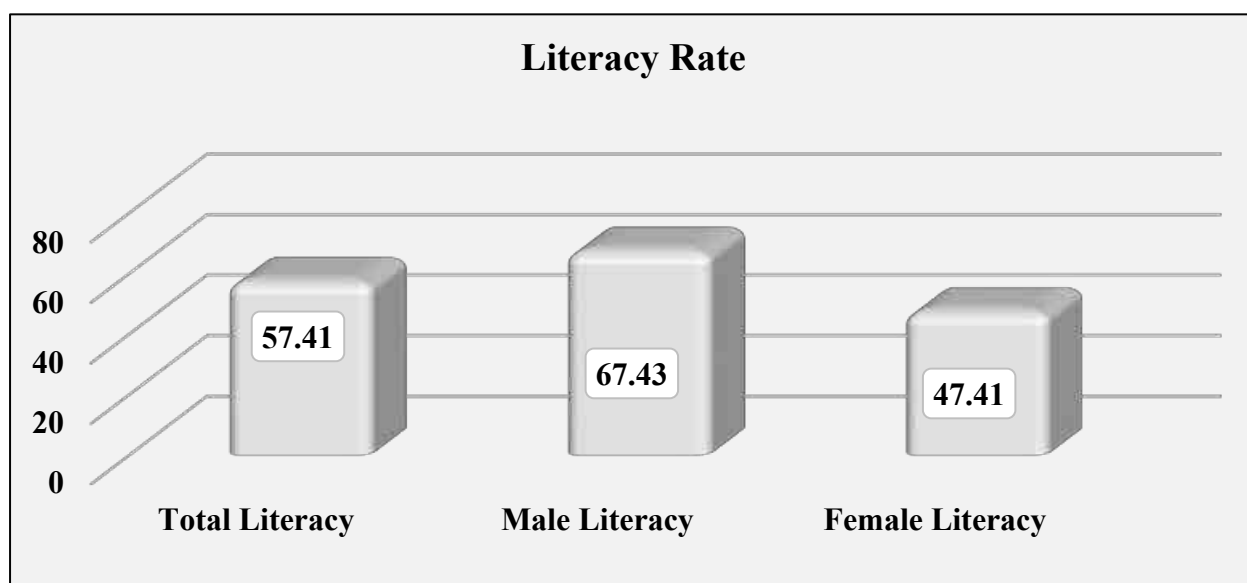
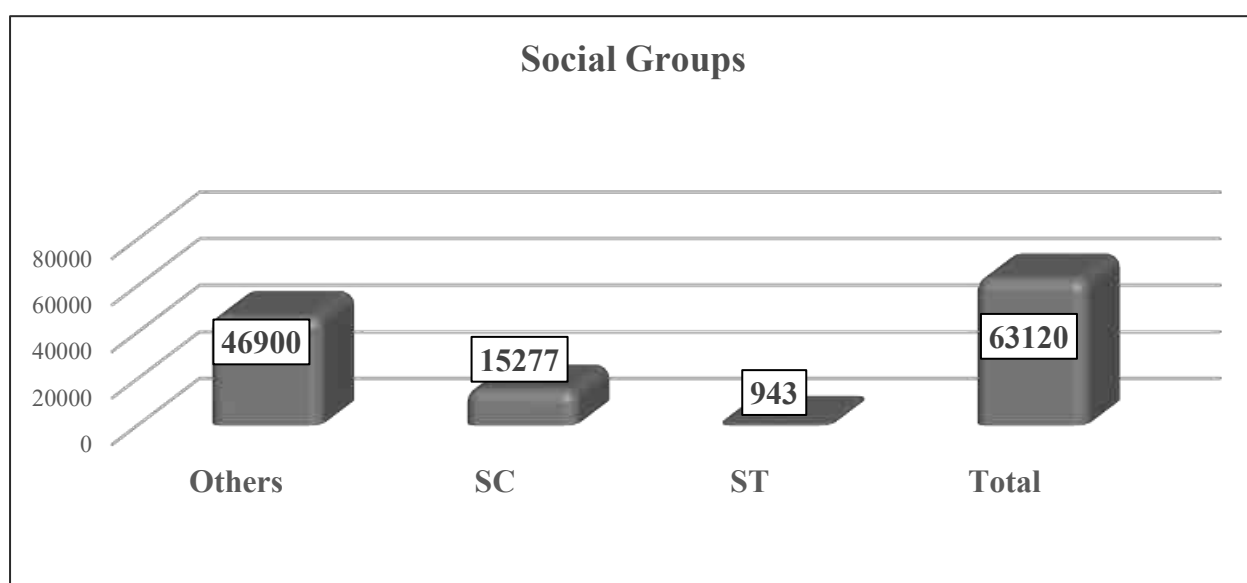
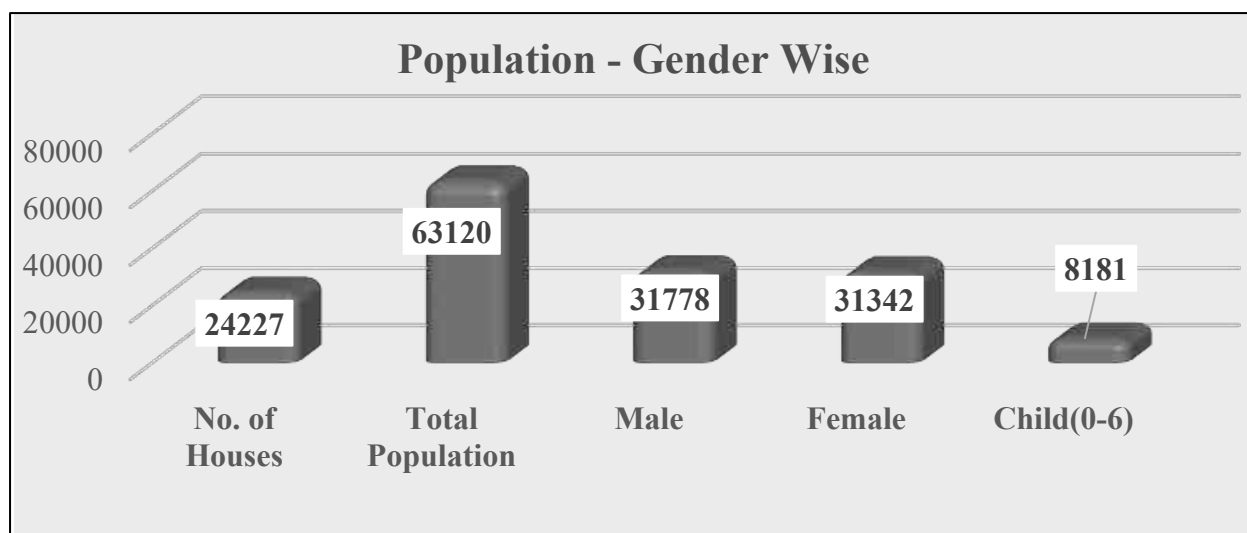


**Figure 3.30: Demographic Details – Population, Social Groups, and Literacy Rate in the Study Villages**

**Table 3.31 Details of Workforce Participation of the Study Area**

| <b>Village<br/>Name</b> | <b>Total<br/>Worker</b> | <b>Total Male Workers</b> | <b>Total<br/>Female Workers</b> | <b>Main Workers</b> | <b>Main Cultivators</b> | <b>Main Agricultural<br/>Labourers</b> | <b>Other Workers</b> | <b>Non-Workers</b> |
|-------------------------|-------------------------|---------------------------|---------------------------------|---------------------|-------------------------|----------------------------------------|----------------------|--------------------|
| Orikkai                 | 2211                    | 1469                      | 742                             | 2034                | 53                      | 15                                     | 831                  | 2396               |
| Chinnaiyankulam         | 520                     | 355                       | 165                             | 247                 | 7                       | 5                                      | 147                  | 779                |
| Thenambakkam            | 4058                    | 2789                      | 1269                            | 3436                | 73                      | 438                                    | 1734                 | 5299               |
| Abdullapuram            | 1067                    | 657                       | 410                             | 651                 | 15                      | 8                                      | 520                  | 1011               |
| Koyambakkam             | 116                     | 67                        | 49                              | 115                 | 14                      | 86                                     | 15                   | 112                |
| Dusi                    | 2858                    | 1637                      | 1221                            | 2160                | 100                     | 429                                    | 385                  | 2258               |
| Kuruvimalai             | 584                     | 412                       | 172                             | 554                 | 47                      | 60                                     | 160                  | 716                |
| Vitchanthangal          | 415                     | 256                       | 159                             | 197                 | 31                      | 18                                     | 102                  | 413                |
| Kalur                   | 1598                    | 927                       | 671                             | 1243                | 266                     | 568                                    | 307                  | 1312               |
| Kalakattur              | 807                     | 460                       | 347                             | 732                 | 133                     | 309                                    | 88                   | 610                |
| Vedal                   | 420                     | 240                       | 180                             | 240                 | 26                      | 27                                     | 129                  | 330                |
| Kuranganilmuttam        | 333                     | 215                       | 118                             | 309                 | 62                      | 197                                    | 49                   | 308                |
| Pallavaram              | 875                     | 513                       | 362                             | 538                 | 89                      | 97                                     | 169                  | 815                |
| Kanikilluppai           | 376                     | 246                       | 130                             | 263                 | 30                      | 210                                    | 7                    | 406                |
| Kolathur                | 190                     | 101                       | 89                              | 189                 | 30                      | 133                                    | 25                   | 160                |
| Kilnaickenpalayam       | 329                     | 195                       | 134                             | 251                 | 80                      | 58                                     | 97                   | 304                |
| Seniyanallur            | 258                     | 144                       | 114                             | 258                 | 104                     | 153                                    | 1                    | 223                |
| Mamandur                | 2003                    | 1233                      | 770                             | 1987                | 557                     | 772                                    | 388                  | 2002               |
| Kundiyanthandalam       | 348                     | 215                       | 133                             | 92                  | 1                       | 1                                      | 90                   | 367                |

|                        |      |     |     |      |     |     |     |      |
|------------------------|------|-----|-----|------|-----|-----|-----|------|
| Perumanallur           | 177  | 99  | 78  | 173  | 42  | 101 | 27  | 183  |
| Vadakalpakkam          | 723  | 395 | 328 | 713  | 318 | 190 | 167 | 493  |
| Nelveli                | 290  | 172 | 118 | 45   | 21  | 6   | 18  | 288  |
| Valavandal             | 211  | 110 | 101 | 211  | 50  | 150 | 9   | 143  |
| Arpakkam               | 1240 | 738 | 502 | 1087 | 128 | 414 | 544 | 1392 |
| Narasamangalam         | 728  | 431 | 297 | 84   | 20  | 5   | 57  | 819  |
| Thalaiyillaperumbakkam | 153  | 102 | 51  | 150  | 8   | 55  | 82  | 188  |
| Alinjalpattu           | 433  | 249 | 184 | 261  | 116 | 20  | 95  | 446  |
| Girijapuram            | 138  | 61  | 77  | 134  | 70  | 58  | 6   | 81   |
| Suruttal               | 614  | 366 | 248 | 612  | 177 | 259 | 142 | 627  |
| Menallur               | 712  | 394 | 318 | 688  | 160 | 413 | 107 | 540  |
| Poonaitthangal         | 95   | 71  | 24  | 88   | 14  | 40  | 33  | 145  |
| Mathur                 | 987  | 576 | 411 | 847  | 314 | 268 | 169 | 985  |
| Sodiyambakkam          | 547  | 334 | 213 | 468  | 190 | 137 | 79  | 628  |
| Magaral                | 1395 | 758 | 637 | 972  | 230 | 439 | 298 | 1118 |
| Bagavandapuram         | 346  | 213 | 133 | 345  | 201 | 99  | 17  | 363  |
| Mangal                 | 360  | 197 | 163 | 72   | 7   | 5   | 60  | 373  |
| Elacheri               | 1040 | 574 | 466 | 950  | 373 | 380 | 163 | 923  |
| Sithalapakkam          | 210  | 173 | 37  | 204  | 115 | 36  | 46  | 357  |
| Pavoor                 | 707  | 362 | 345 | 589  | 168 | 327 | 93  | 534  |
| Arasanipalai           | 637  | 324 | 313 | 633  | 344 | 261 | 27  | 358  |
| Vailathur              | 254  | 141 | 113 | 249  | 97  | 119 | 31  | 231  |
| Punnai                 | 372  | 206 | 166 | 235  | 123 | 33  | 79  | 315  |
| Dharmacheri            | 16   | 8   | 8   | 14   | 2   | 7   | 5   | 18   |

Source: <https://censusindia.gov.in/nada/index.php/catalog/45345>

### 3.6.6 Workforce Participation

The table 3.31 presents an in-depth breakdown of workforce characteristics across villages in the study area of district. The workforce participation across the villages in the study area exhibits significant variability in both size and composition. Total workers range from a minimal 16 in Dharmacheri to as high as 4,058 in Thenambakkam, indicating substantial differences in population size and labor engagement among the villages. Male workers consistently outnumber female workers in nearly all villages, highlighting a pronounced gender disparity in workforce participation. Main workers constitute the majority of employed individuals, reflecting a workforce largely engaged in sustained economic activities rather than marginal or seasonal work.

Agriculture remains the primary occupation, with many individuals employed as cultivators or agricultural labourers. Villages such as Mamandur, Kalur, Magaral, and Thenambakkam have a notable proportion of their workforce involved in cultivation and agricultural labour, underscoring the agrarian nature of the local economy. Non-agricultural employment, classified as ‘other workers,’ is relatively limited, suggesting low economic diversification and limited availability of alternative income sources.

The number of non-workers is substantial in most villages, particularly larger ones, indicating high dependency ratios and a significant portion of the population reliant on the working population for livelihood. Smaller villages, such as Kundiyanthandalam, Mangal, and Dharmacheri, exhibit low workforce numbers, which may reflect either limited local employment opportunities or demographic factors such as higher proportions of children and elderly residents.

Finally, the detailed information indicated a predominantly agrarian economy characterized by gender disparities in employment, a high reliance on agricultural work, and a substantial non-working population. These patterns highlight the need for targeted interventions to promote female workforce participation, diversify economic opportunities, and enhance sustainable livelihoods beyond agriculture.

The data reveals a predominantly agrarian workforce of 31,751 people, with males (19,185) outnumbering females (12,566). Most workers (25,320) are engaged in main employment, primarily in agriculture, with 5,006 cultivators and 7,406 agricultural laborers. Non-agricultural workers number 7,598, indicating some economic diversification. The non-working population is almost as large as the workforce (31,369), reflecting a high dependency

ratio. The notable gender gap points to socio-cultural barriers limiting female participation in the workforce.

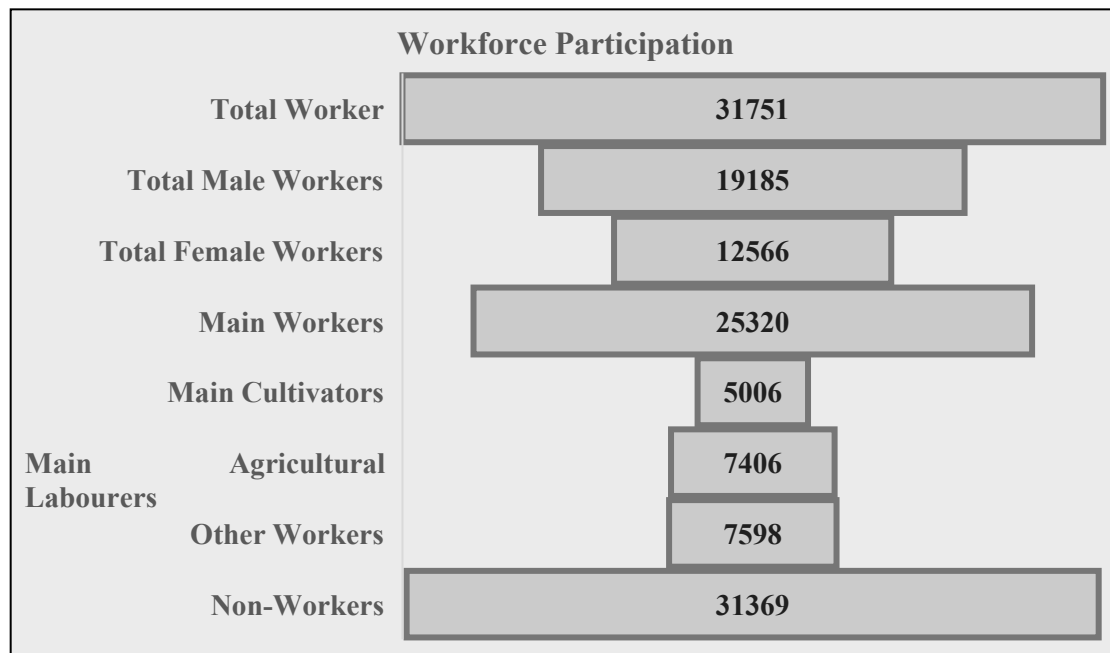


**Figure 3.31 Details of Workforce participation in the Study Villages**

Additionally, the study finds that while certain villages are progressing with diverse employment and better gender inclusion, others remain heavily reliant on agriculture and have limited workforce engagement. Encouraging non-farm employment, particularly in rural and semi-urban areas, could bridge economic disparities. Skill development programs for women and youth, infrastructure enhancement, and local job creation through MSMEs or agro-processing units would help balance workforce participation and stimulate rural development across the district.

### ***CSR and DMR funds for Development***

As per SEAC recommendation the project proponent should spend minimum of 5 lakhs to the nearby school from the proposed project site as part of CER cost. Also, the village panchayat will get direct benefit from the government through District mineral Resource fund (DMF) for infrastructure development activities.

- ❖ Awareness and Opinion of the People About the Project, to assess public awareness and opinions regarding the proposed project, the following key observations were recorded:
- ❖ During the survey, it was observed that only residents of nearby villages were aware of the proposed project, while those in more distant villages were largely unaware.



- ❖ People in the region expressed expectations that the project would generate employment opportunities and lead to improvements in education, transportation, and sanitation facilities provided by the project authorities.

### ***Recommendation and Suggestions***

The village development plans are made in consultation with the community through Gram Sabha; these appear to address the needs of the community. However, it may be noted that at the implementation stage these plans often are fraught with problem of inadequate funds, lack of proper planning, corruption, vested interests and political agendas. Hence while ascertaining the scope for convergence with the government activities, care must be taken to ascertain realistic possibilities for implementation.

- Women empowerment: Home based income generation activities, vocational training programs and common education centre for increasing the literacy rate.
- Education: Free uniform, construction of common rooms and library, computer education and physical education, furniture and equipment in schools, up-gradation of existing school infrastructure through the CSR funds.
- Agriculture/livestock: Infrastructure such as agricultural practices, electricity connections, assistance with buying improved tools and equipment, capacity building, supply and/or knowledge of better variety of seeds, pasture land development and trainings on animal husbandry & facility of veterinary doctor.
- Health: Improvements in sanitary conditions of villages, assistance with construction of latrines, improvement in drainage system, health camps and awareness campaigns for diseases like common cold, malaria, typhoid, tuberculosis, yellow fever and pneumonia. Repairing of PHCs and Anganwadi centres.
- People with disability: Establishment of centre for special education, sensitization of the community towards disabled and awareness on Government schemes.
- Marginalized Communities and Vulnerable Groups: 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.
- Connectivity: Transport connectivity to easiness accessibility to the region.
- Greenbelt: Establish a greenbelt and plant saplings around quarry boundaries, village schools, and village roads.

While developing an Action Plan, it is very important to identify the population who falls under the marginalized and vulnerable groups. So that special attention can be given to these groups with special provisions while making action plans.

### 3.6.7 Conclusion

This study was carried out the baseline socio-economic conditions of the study area. It examined parameters including the population, number of households, literacy rate, sex ratio, workforce details, and the availability of essential amenities like transportation, drinking water, road connectivity, and educational facilities in the study area. The study revealed both positive and negative socio-economic implications associated with the proposed project and cluster quarries. While potential environmental and social impacts must be addressed, the project is expected to provide significant economic benefits in terms of local employment and improved livelihood opportunities in directly and indirectly.

Therefore, with the implementation of effective mitigation and management measures, the project can contribute positively to the socio-economic development of the area while minimizing adverse impacts.

### 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 SH -118A (Kanchipuram – Uthiramerur) and NH - 48 (Chennai – Vellore) as shown in Table 3.32- 3.35 and in Figure 3.32. 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 3.32 Traffic Survey Locations**

| Station Code | Road Name                            | Distance and Direction |
|--------------|--------------------------------------|------------------------|
| TS1          | Village Road                         | 1.10km - NE            |
| TS2          | SH -118A (Kanchipuram – Uthiramerur) | 3.70km - NE            |
| TS3          | NH - 48 (Chennai – Vellore)          | 20.48km - N            |

*Source: On-site monitoring by GTMS FAE & TM*

**Table 3.33 Existing Traffic Volume**

| Station code | HMV |     | LMV |     | 2/3 Wheelers |     | Total PCU |
|--------------|-----|-----|-----|-----|--------------|-----|-----------|
|              | No  | PCU | No  | PCU | No           | PCU |           |
| TS1          | 33  | 99  | 40  | 40  | 55           | 28  | 167       |
| TS2          | 65  | 195 | 72  | 72  | 80           | 40  | 307       |
| TS3          | 80  | 240 | 102 | 102 | 125          | 62  | 404       |

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 3.34 Rough Stone Transportation Requirement**

| Transportation of Rough Stone Per day |                      |               |
|---------------------------------------|----------------------|---------------|
| Capacity of trucks                    | No. of Trips per day | Volume in PCU |
| 15 tonnes                             | 54                   | 162           |

Source: Approved Mining Plan

**Table 3.35 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 |
|-------|--------------------------------|----------------------------------------|----------------------|-----------------------------------------------------|
| TS1   | 167                            | 162                                    | 329                  | 1200                                                |
| TS2   | 307                            | 162                                    | 469                  | 1200                                                |
| TS3   | 404                            | 162                                    | 566                  | 1500                                                |

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

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

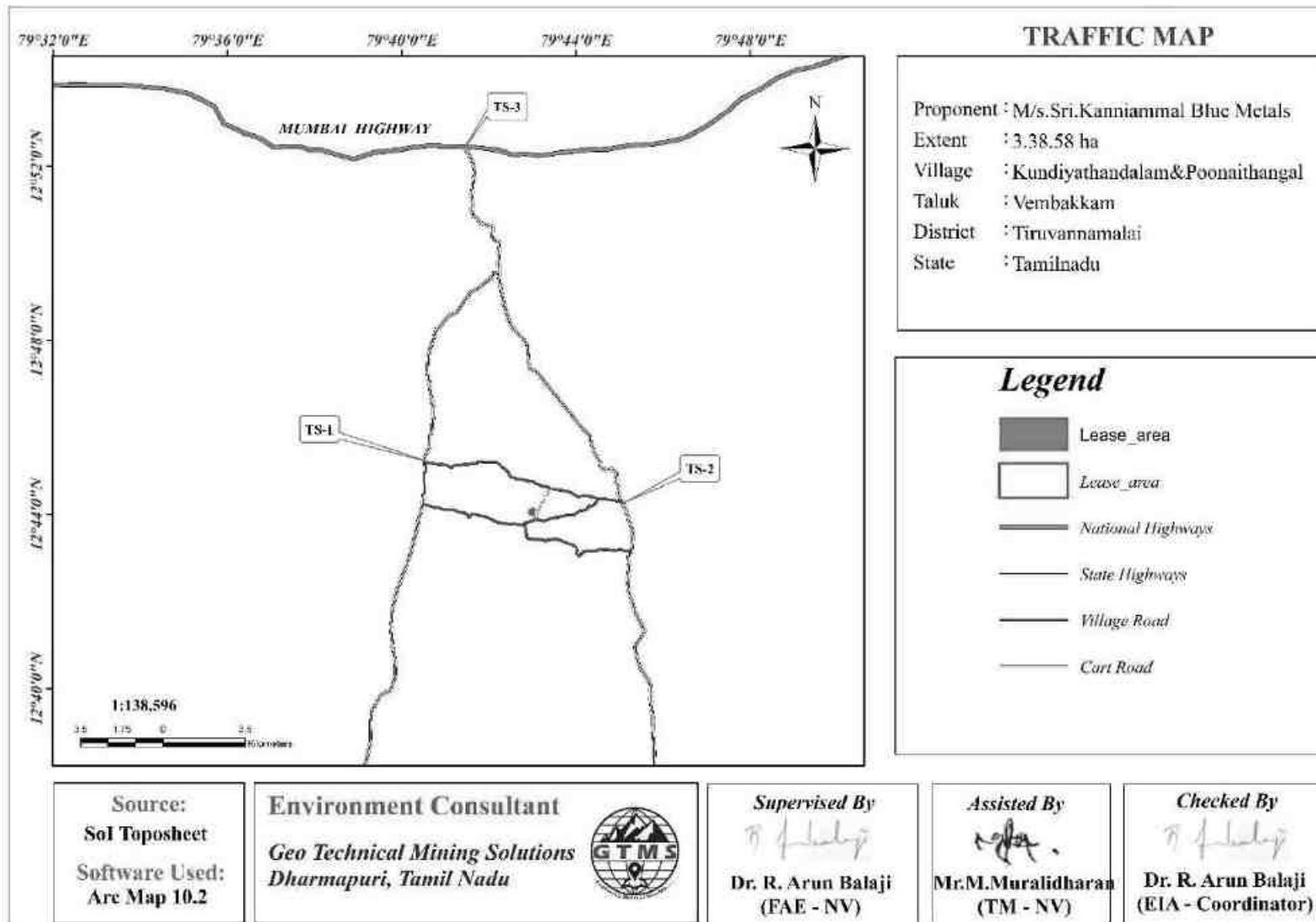


**Figure 3.32 Traffic Density Map**

### 3.8 SITE SPECIFIC FEATURES

There are no Wildlife Sanctuaries and National Park within 10 km radius. Therefore, there will be no need of acquisition/diversion of forest land. The details related to the environmentally sensitive areas around the proposed mine lease area i.e., 10 km radius and the nearby water bodies are given in the Table 3.36.

**Table 3.36 Details of Environmental Sensitive Ecological Features in the Study Area**

| S. No. | Sensitive Ecological Features                     | Name                    | Areal Distance in km    |
|--------|---------------------------------------------------|-------------------------|-------------------------|
| 1      | National Park / Wild life Sanctuaries             | Karikili Bird sanctuary | 19.48Km- SE             |
| 2      | Reserve Forest                                    | Marudham RF             | 9.02km SE               |
|        |                                                   | Edamachi RF             | 16.28Km E               |
|        |                                                   | Kavanipakkam RF         | 16.7km E                |
|        |                                                   | Perugoli RF             | 16.77km E               |
|        |                                                   | Koliyalam RF            | 22.9km S                |
|        |                                                   | Thandappan Thangal RF   | 19.7km NW               |
|        |                                                   | Pullavakkam RF          | 23.9km W                |
|        |                                                   | Vadakkupattu RF         | 24.48km NE              |
|        |                                                   | Vengunam RF             | 24.6km SW               |
| 3      | Lakes/ Reservoirs/ Dams/Streams/Rivers            | Cheyyar River           | 4.14km SE               |
|        |                                                   | Palar River             | 5.72km NE               |
|        |                                                   | Mamandur Lake           | 5.74 km NW              |
|        |                                                   | Poonathangal Tank       | 0.6km NW                |
| 4      | Tiger Reserve/Elephant Reserve/ Biosphere Reserve | None                    | Nil within 10 km radius |
| 5      | Densely Polluted Areas                            | None                    | Nil within 10 km radius |
| 6      | Mangroves                                         | None                    | Nil within 10 km radius |
| 7      | Mountains/Hills                                   | None                    | Nil within 10 km radius |
| 8      | Centrally Protected Archaeological Sites          | None                    | Nil within 10 km radius |
| 9      | Industries/ Thermal Power Plants                  | None                    | Nil within 10 km radius |
| 10     | Defence Installation                              | None                    | Nil within 10 km radius |

Source: Survey of India Toposheet



Figure 3.33 Field Study Photographs

## CHAPTER IV

### ANTICIPATED ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

#### 4.0 GENERAL

The identification of potential environmental impacts is indeed the crucial first step in the Environmental Impact Assessment (EIA) process utilizing various techniques such as checklists, matrices and network diagrams to understand a project's effects. The matrix method used in this study provides a structured way to identify and assess the impacts ensuring the project can be implemented in an eco-friendly manner. This chapter discusses the anticipated impacts on land, soil, water, air, noise, biological and socioeconomic environments.

The proposed stone mining project involves blasting, drilling and screening operations which contribute to environmental impacts is given in Table 4.1. The project is designed to minimize these impacts by implementing mitigation measures and ensuring a marginal environmental footprint with a detailed analysis to follow in subsequent tables.

**Table 4.1 Impact identification matrix.**

| Activities                                                                            | Environmental Attributes |      |       |     |       |         |                 |            | OHS |
|---------------------------------------------------------------------------------------|--------------------------|------|-------|-----|-------|---------|-----------------|------------|-----|
|                                                                                       | Land                     | Soil | Water | Air | Noise | Ecology | Socio Economics | Aesthetics |     |
| Site clearing & Site services                                                         | √                        | √    |       | √   |       | √       |                 |            |     |
| Development of Greenbelt                                                              |                          |      |       |     |       | √       |                 | √          |     |
| Operation Phase (Drilling, Blasting Loading and unloading, Transportation)            | √                        | √    |       | √   | √     | √       |                 |            | √   |
|                                                                                       | √                        | √    |       | √   | √     | √       |                 |            | √   |
|                                                                                       | √                        | √    |       | √   | √     | √       |                 |            | √   |
| Employment and the material usage                                                     |                          |      |       |     |       |         | √               |            |     |
| Mine closure (Removal of machineries, structures and Danger due to inadvertent entry) |                          |      |       | √   | √     |         | √               |            | √   |

√ Indicates Impact

## 4.1 LAND ENVIRONMENT

### Anticipated Impacts

- ❖ Converting barren land of 3.38.58 hectares to rough stone and gravel mining creates a significant and usually irreversible change in land use and land cover involving the physical alteration of the land's surface, potential deforestation, loss of biodiversity, altered topography from pits and spoil dumps.
- ❖ Heavy vehicle movement causes significant problems to nearby agriculture and human habitation. These pollutants can degrade soil quality and introduce heavy metals into the environment.
- ❖ During transportation the tippers damage the bituminous roads. The primary damage is caused by the fourth power law (*The law posits that if you double an axle's load, the damage caused to the pavement increases by a factor of 2x4 or 16 times*) where pavement damage increases with the fourth power of the axle load. The immense weight of heavy payloads on an axle exerts a concentrated and repetitive stress on the road surface leading to permanent strain, premature failure and a cumulative damage.
- ❖ Rain drops hitting stone crushing waste can break apart the particles and flowing water detaches them from the surface transports and redeposits these particles especially from sloped surfaces. This a form of splash erosion followed by sheet erosion which can lead to environmental issues.

### Mitigation measures

- ❖ After mining there is a huge void of 1.95.50 hectares upto a depth of 45m is useful for rain water storage structure has an advantage for local farmers. The artificial pond boundary shall be fences to avoid any mishaps.
- ❖ Union ministry of road transport and highways on July 16<sup>th</sup> 2018 increased the maximum cap of axle load limit by 20 to 25 percent cross various categories to keep the limit “at par with international standards”.

| Maximum Safe Axle Weight                                                                                   |                                                                                                                              |                          |
|------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------|--------------------------|
| Sl. No.                                                                                                    | Axle Type                                                                                                                    | Maximum Safe Axle Weight |
| 1.                                                                                                         | <b>Single Axle</b>                                                                                                           |                          |
| 1.1                                                                                                        | Single Axle with single Tyre                                                                                                 | 3.0 tonnes               |
| 1.2                                                                                                        | Single Axle with two Tyres                                                                                                   | 7.5 tonnes               |
| 1.3                                                                                                        | Single Axle with four Tyres                                                                                                  | 11.5 tonnes*             |
| 2.                                                                                                         | <b>Tandem Axles (Two axles) (where the distance between two axles is less than 1.8 Mtr.)</b>                                 |                          |
| 2.1                                                                                                        | Tandem axle for rigid vehicles, trailers and semi-trailers                                                                   | 21 tonnes*               |
| 2.2                                                                                                        | Tandem axle for Puller tractors for hydraulic and pneumatic trailers                                                         | 28.5 tonnes              |
| 3.                                                                                                         | <b>Tri-axes (Three axles) (where the distance between outer axles is less than 3 Mtr.)</b>                                   |                          |
| 3.1                                                                                                        | Tri-axle for rigid vehicles, trailers and semi-trailers                                                                      | 27 tonnes*               |
| 4.                                                                                                         | Axle Row (two axles with four tyres each) in Modular Hydraulic trailers (9 tonnes load shall be permissible for single axle) | 18 tonnes                |
| * Note: If the vehicle is fitted with pneumatic suspension, 1 tonne extra load is permitted for each axle. |                                                                                                                              |                          |



MoRTH knows that previously built Indian roads are made keeping standard axle loads. The new national and state highways along with expressways can be built by using new norms but for the existing roads the life will be reduced on average by one year.

- ❖ 6-wheel tipper generally has a maximum legal speed limit which can be up to 60 km/h and speeds should be reduced for loaded conditions. The mine management should take care of the speed of vehicles i.e up to 40km/h in village roads constructed under Pradhan Mantri Gram Sadak Yojana and other district roads developed by Highways and Minor Ports Department, Government of Tamil Nadu as each time a truck passes the concentrated stress causes a small amount of permanent strain on the pavement. Over time these small strains accumulate and lead to significant fatigue and eventual failure.
- ❖ 6-wheel tippers of not more than 9tons payload capacity covered with tarpaulin to stop the spillage and dust should use.
- ❖ Protective measures such as establish plants like grasses, cover crops and trees to form a dense layer over the dump absorbing raindrop energy and holding particles in place.

## **4.2 SOIL ENVIRONMENT**

### **Anticipated Impacts**

- ❖ The fertility status of the soil near by the lease area may affect due to extra dust deposition on the soil. Dust deposition from a lease area can harm soil fertility by physically blocking soil pores, reducing aeration and water infiltration, and potentially altering the soil's chemical properties. This damage to the topsoil negatively impacts plant growth by interfering with photosynthesis and nutrient uptake ultimately decreasing crop production.
- ❖ Topsoil will be scraped from the area of 1.29.88hectares in the project site will store in safety area left for 7.5m and 50m in the western side as shown in mining plan.

### **Mitigation measures**

- ❖ When stock piling of top soil is done the mound should not be higher than 1.2m and 3.0m.
- ❖ To minimize surface runoff and erosion the topography of a graded surface should be designed to create terraces or benches that follow land contours which intercept sheet flow. Additionally, a bulldozer's tracks can be used to create a fine-scale roughened surface perpendicular to the slope and stockpiles should be constructed with a rough surface to improve drainage, reduce erosion and encourage revegetation.
- ❖ Efforts will be made to minimize the storage time to prevent nutrient loss.

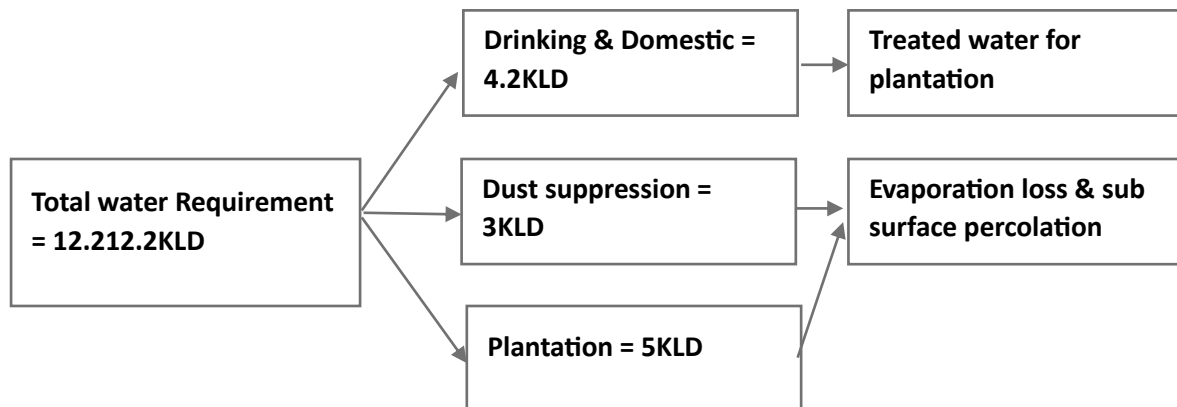
- ❖ To protect the quality of stockpiled topsoil immediate re-vegetation is crucial. Temporary seeding should be done within 30 days of stockpile formation to control erosion, prevent weed growth and maintain healthy soil microbes.
- ❖ If the stockpile will not be reused within 12 months it must be stabilized with permanent vegetation to ensure long-term erosion and weed control.
- ❖ The stored topsoil will be utilized for plantations in later phases during the progressive and final closure of the mine.

#### 4.3 WATER ENVIRONMENT

##### Anticipated Impacts

- ❖ 12.2KLD (12,200 liters per day) water requirement for drinking, domestic, dust suppression and plantation.

##### Water Balance Chart of the Mine



- ❖ The domestic effluents being generated during mine operation.
- ❖ Major impact of opencast mining on groundwater regime is quality deterioration. The proposed mining activities shall be carried out up to a depth of 45m from average ground level. The specific water table depth in the core and buffer zone is between 10.8m and 13.5 meters below ground level.
- ❖ The volume of rain water entering to the mine and accumulating in the quarry has been estimated on the basis of direct catchment area, maximum daily precipitation and the run-off coefficient.  $(Q = A \times H \times \bar{d})$  **cubic meters/day**.

Where A- catchment area in m<sup>2</sup>

H- Max daily precipitation in mm

$\bar{d}$ - Run-off Co-efficient.

The run off co-efficient for mined out area is 0.60m<sup>3</sup>. The all-time record for maximum daily precipitation in Tiruvannamalai district was 468mm on September 30, 2018 as

reported by CEIC Data. More recent rainfall records are 110mm on October 17, 2025. The maximum broken area is 1.95.50hectares in the sixth year and estimation for make of water done on the quarry parameters for sixth year onwards.

$$Q = 3.38.58\text{hecatres} \times 10000 \times 0.175 \times 0.60 \text{ m}^3.$$

$$Q = 3555\text{m}^3.$$

Total accumulated water in the pit is  $3555\text{m}^3$ .

Additionally, 20% of water from seepage is  $4266\text{m}^3$ .

Total water estimated for pumping requirement =  **$4266\text{m}^3$** .

If we take the all-time record then the total water estimated for pumping =  **$4266\text{m}^3$** .

To manage rain water runoff into quarry a 5 HP diesel operated pump will be placed at the site during the monsoon.

### **Mitigation Measures**

- ❖ The hard rock itself has very few interconnected pore spaces, limiting the amount of water it can store or transmit. Groundwater flow and storage occur primarily in secondary openings such as joints, cracks and fissures. The thickness of the weathered layer, where more significant porosity can develop, is typically limited to 1-3 meters, particularly in low-lying topographic areas. The groundwater in these shallow zones is under unconfined (or water table) conditions, meaning it is directly connected to the surface and not confined by impermeable layers.
- ❖ The storm water discharge coming out of quarries and dump through a network of garland drains is expected to contain solid particles. These solid particles shall be removed by settling in the settling pond before being used for dust suppression and plantation. Hence, there shall be no change in drainage system due to this mining project in buffer zone.
- ❖ Domestic sewage from site office will be discharged in MAK Anaerobic bacteria digestion bio-septic tank. The treated water will be utilized for watering and maintaining the green belt.
- ❖ Groundwater development efforts would need to focus on the weathered and fractured zones near the surface in the buffer zone.
- ❖ Periodic (every 6 month once) analysis of ground water level and quality from the open well DW8 and bore well BW3 as shown in Figure 3.8 & 3.10 to find the change due to quarrying.

- ❖ The average annual rainfall of the project area is 1521mm and the runoff coefficient factors have been taken as per guidelines of Manual on Norms and Standards for Environmental Clearances by MoEF & CC, Govt. of India.

The total annual runoff can be calculated as:

$$\text{Runoff} = \text{Rainfall} \times \text{Catchment Area} \times \text{Runoff Coefficient}$$

Annual Rainfall = 1521mm

Total Project Area = 33858sq.m

Coefficient of Run off for Rooftop (Inclined) = 0.90

Coefficient of Run off for Rooftop (Flat) = 0.80

Coefficient of Run off for Road/Paved Area = 0.70

Coefficient of Run off for Open Area = 0.25

Coefficient of Run off for Greenbelt Area = 0.15 Rain water can effectively be collected from Maximum size of void in 6th year of mining = 19550sq. m.

Top soil dump area = 12988sq.m

Road & Infrastructure = 500sq.m

Runoff from Void pit area = 19550sq.m x 0.805 m x 0.25 = 3934m<sup>3</sup>

Runoff from Top soil dump area = 0.80m x 12988sq. m x 0.25 = 2597.6m<sup>3</sup>

Runoff from Road & Infrastructure = 0.805m x 500sq. m x 0.70 = 281.75m<sup>3</sup>

Total Runoff from Project Area = 4475.35m<sup>3</sup>

The annual runoff generated in the project site is 4475.35m<sup>3</sup>. By considering the loss of 20% due to evaporation, spillage and wastage the effective runoff that can be harvested inside the project area is **3550.28m<sup>3</sup>**.

Daily water requirement (except drinking purpose) is 8m<sup>3</sup>. So, with 300 working days the water requirement will be = 8m<sup>3</sup> X 300 = **2400m<sup>3</sup>**

The surface runoff being generated from the project area will be channelized to rain water harvesting pond of 2m x 2m x 2m through network of drainage system 1m x 1m. The bottom of the ponds is naked and natural seepage from the bottom will recharge the ground water regime. Hence the storage pond will act as recharging structure. Even though rain water will be sufficient to fulfil the daily requirement of water but in the initial years of mining when the mining pit is smaller in size or in the year with deficit rainfall surface water will be collected with due permission.

#### 4.4 AIR ENVIRONMENT

##### Anticipated Impact

The main cause of air pollution in open-cast mining is the generation of airborne particulate matter (dust) from various mining activities including drilling, blasting, excavation, loading/unloading, vehicle movement on haul roads and the dumps. These activities release large quantities of fugitive dust which are then carried by the wind and can contribute to respiratory health problems for nearby communities and miners. The source of pollution is given in table below.

| Activities              | Air pollutants                                                                |
|-------------------------|-------------------------------------------------------------------------------|
| Drilling                | PM <sub>10</sub> , PM <sub>2.5</sub>                                          |
| Blasting                | PM <sub>10</sub> , PM <sub>2.5</sub> , SO <sub>x</sub> , NO <sub>x</sub>      |
| Loading & unloading     | PM <sub>10</sub> , PM <sub>2.5</sub>                                          |
| Haul road               | PM <sub>10</sub> , PM <sub>2.5</sub>                                          |
| Transportation          | PM <sub>10</sub> , PM <sub>2.5</sub> , SO <sub>x</sub> , NO <sub>x</sub> , CO |
| Waste/Top soil handling | PM <sub>10</sub> , PM <sub>2.5</sub>                                          |

The air dispersion modelling study was conducted using the AERMOD Cloud remote version for assessment of incremental Ground level concentration (GLC) for the proposed production. Area source model taken into consideration taking into consideration of the conceptual quarry area and dump area. Further line source model was taken into consideration for transportation of material through haul road. Model Setup is given in Table below

| Parameter                   | Details                                          |
|-----------------------------|--------------------------------------------------|
| Model Name                  | Aermod                                           |
| Model Type                  | Steady state Gaussian plume air dispersion model |
| Topography                  | Plain terrain                                    |
| Average Time                | 24 hours                                         |
| Source Type                 | Area source                                      |
| Boundary limit              | 5km X 5km                                        |
| Surface Meteorological Data | Site specific data processed by AERMET           |
| Receptor Height             | 0                                                |
| Anemometer height           | 10m                                              |

The air pollution modelling correctly focuses on particulate matter as the key pollutant for a mining project given that dust from mining operations and transportation is the primary source of air pollution in such industries rather than SO<sub>x</sub> or NO<sub>x</sub> which are typically associated with vehicular emissions. The incremental Ground Level Concentrations (GLCs) predicted are specifically for particulate matter reflecting the anticipated contribution of the proposed mining project to local air quality.

## Emission Estimation

Emission resulting from different mining activities is estimated using relevant empirical formula developed by Chaulya et al.,2001 and Jyothi Prabha, Gurdeep Singh and I.N.Sinha, 2003 “Emission Factor Equations for Haul roads: The Indian Perspective”, Indian Journal of Air Pollution Control Vol. VI No. I March pp 37- 43. The equations used for fugitive emission estimation have been given in Table 4.2.

**Table 4.2 Empirical Formula for Emission Rate from Overall Mine**

|                              | Pollutant     | Source Type | Empirical Equation                                                                   | Parameters                                                                                                                                                                                                                                                      |
|------------------------------|---------------|-------------|--------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Overall Mine                 | SPM           | Area        | $E = [u^{0.4}a^{0.2}\{9.7 + 0.01p + b/(4+0.3b)\}]$                                   | u = Wind speed(m/s).<br>p = Mineral production (Mt/yr). b = Overburden handling (Mm <sup>3</sup> /yr).<br>a = Lease area(km <sup>2</sup> ).<br>E = Emission rate(g/s).                                                                                          |
| Transportation through roads | Fugitive dust | line        | $E = [\{(100-m)/m\}^{0.8} \{s/(100-s)\}^{0.1} u^{0.3} \{2663 + 0.1(v+fc)\} 10^{-6}]$ | E = Emission Rate (g/sec/m)<br>m = Moisture Content of the road = 10%, s = Silt Content of the Road = 10%<br>u = Wind Speed<br>v = Average Vehicle Speed<br>f = frequency of Vehicle movement in number per hour<br>c = Capacity of the dumper in tons = 12 ton |

The emission rate thus calculated using the empirical formula is used as one of the inputs in the AERMOD modelling. It is important to note that PM<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> emission results have been given in Table 4.3.

**Table 4.3 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> | 0.695317427            | 33858                        | 2.05363E-05                            |
| Overall Mine | PM <sub>10</sub>  | 1.390634853            | 33858                        | 4.10726E-05                            |

#### 4.4.1 Modelling of Incremental Concentration

The post project resultant concentrations of PM<sub>10</sub>, PM<sub>2.5</sub> is given in Tables 4.4 - 4.5.

**Table 4.4 Incremental & Resultant GLC of PM<sub>2.5</sub>**

| Station ID | Distance to core area (km) | PM 2.5 concentrations(µg/m <sup>3</sup> ) |          |           |       | Comparison against air quality standard (60 µg/m <sup>3</sup> ) | Magnitude of change (%) | Limit |
|------------|----------------------------|-------------------------------------------|----------|-----------|-------|-----------------------------------------------------------------|-------------------------|-------|
|            |                            | Direction                                 | Baseline | Predicted | Total |                                                                 |                         |       |
| AAQ1       | ---                        | --                                        | 24.40    | 9.27      | 33.67 | Below standard                                                  | 38.0                    | 60    |
| AAQ2       | 1.45                       | NW                                        | 17.22    | 2         | 19.22 |                                                                 | 11.6                    | 60    |
| AAQ3       | 1.05                       | SW                                        | 17.42    | 4         | 21.42 |                                                                 | 23.0                    | 60    |
| AAQ4       | 1.33                       | NE                                        | 17.09    | 2         | 19.09 |                                                                 | 11.7                    | 60    |
| AAQ5       | 5.14                       | SW                                        | 16.62    | 0.5       | 17.12 |                                                                 | 3.0                     | 60    |
| AAQ6       | 2.70                       | SE                                        | 17.38    | 1         | 18.38 |                                                                 | 5.8                     | 60    |
| AAQ7       | 2.79                       | SW                                        | 17.1     | 1         | 18.1  |                                                                 | 5.8                     | 60    |

**Table 4.5 Incremental & Resultant GLC of PM<sub>10</sub>**

| Station ID | Distance to core area (km) | PM <sub>10</sub> concentrations(µg/m <sup>3</sup> ) |          |           |       | Comparison against air quality standard (100 µg/m <sup>3</sup> ) | Magnitude of change (%) | Limit |
|------------|----------------------------|-----------------------------------------------------|----------|-----------|-------|------------------------------------------------------------------|-------------------------|-------|
|            |                            | Direction                                           | Baseline | Predicted | Total |                                                                  |                         |       |
| AAQ1       | ---                        | --                                                  | 63.78    | 17.6      | 81.38 | Below standard                                                   | 27.6                    | 100   |
| AAQ2       | 1.45                       | NW                                                  | 44.37    | 3         | 47.37 |                                                                  | 6.8                     | 100   |
| AAQ3       | 1.05                       | SW                                                  | 44.88    | 8         | 52.88 |                                                                  | 17.8                    | 100   |
| AAQ4       | 1.33                       | NE                                                  | 44.03    | 3         | 47.03 |                                                                  | 6.8                     | 100   |
| AAQ5       | 5.14                       | SW                                                  | 42.82    | 1         | 43.82 |                                                                  | 2.3                     | 100   |
| AAQ6       | 2.70                       | SE                                                  | 44.79    | 1         | 45.79 |                                                                  | 2.2                     | 100   |
| AAQ7       | 2.79                       | SW                                                  | 43.98    | 3         | 46.98 |                                                                  | 6.8                     | 100   |

The Air Quality index for the baseline and predicted values of PM<sub>2.5</sub> and PM<sub>10</sub> are given in table below.

| Station ID | Distance to core area (km) | Direction | PM <sub>2.5</sub> (µg/m <sup>3</sup> ) |                                  | AQI for PM <sub>2.5</sub> | PM <sub>10</sub> (µg/m <sup>3</sup> ) |                                  | AQI for PM <sub>10</sub> |
|------------|----------------------------|-----------|----------------------------------------|----------------------------------|---------------------------|---------------------------------------|----------------------------------|--------------------------|
|            |                            |           | Baseline Conc.                         | Total (Baseline + Predicted GLC) |                           | Baseline Conc.                        | Total (Baseline + Predicted GLC) |                          |
| AAQ1       | ---                        | --        | 24.40                                  | 33.67                            | 6.1                       | 63.78                                 | 81.38                            | 116                      |
| AAQ2       | 1.45                       | NW        | 17.22                                  | 19.22                            | 3.4                       | 44.37                                 | 47.37                            | 51                       |
| AAQ3       | 1.05                       | SW        | 17.42                                  | 21.42                            | 3.7                       | 44.88                                 | 52.88                            | 58                       |
| AAQ4       | 1.33                       | NE        | 17.09                                  | 19.09                            | 3.4                       | 44.03                                 | 47.03                            | 50                       |
| AAQ5       | 5.14                       | SW        | 16.62                                  | 17.12                            | 3                         | 42.82                                 | 43.82                            | 47                       |
| AAQ6       | 2.70                       | SE        | 17.38                                  | 18.38                            | 3.2                       | 44.79                                 | 45.79                            | 49                       |
| AAQ7       | 2.79                       | SW        | 17.1                                   | 18.1                             | 3.2                       | 43.98                                 | 46.98                            | 50                       |

<https://www.airnow.gov/aqi/aqi-calculator-concentration/>

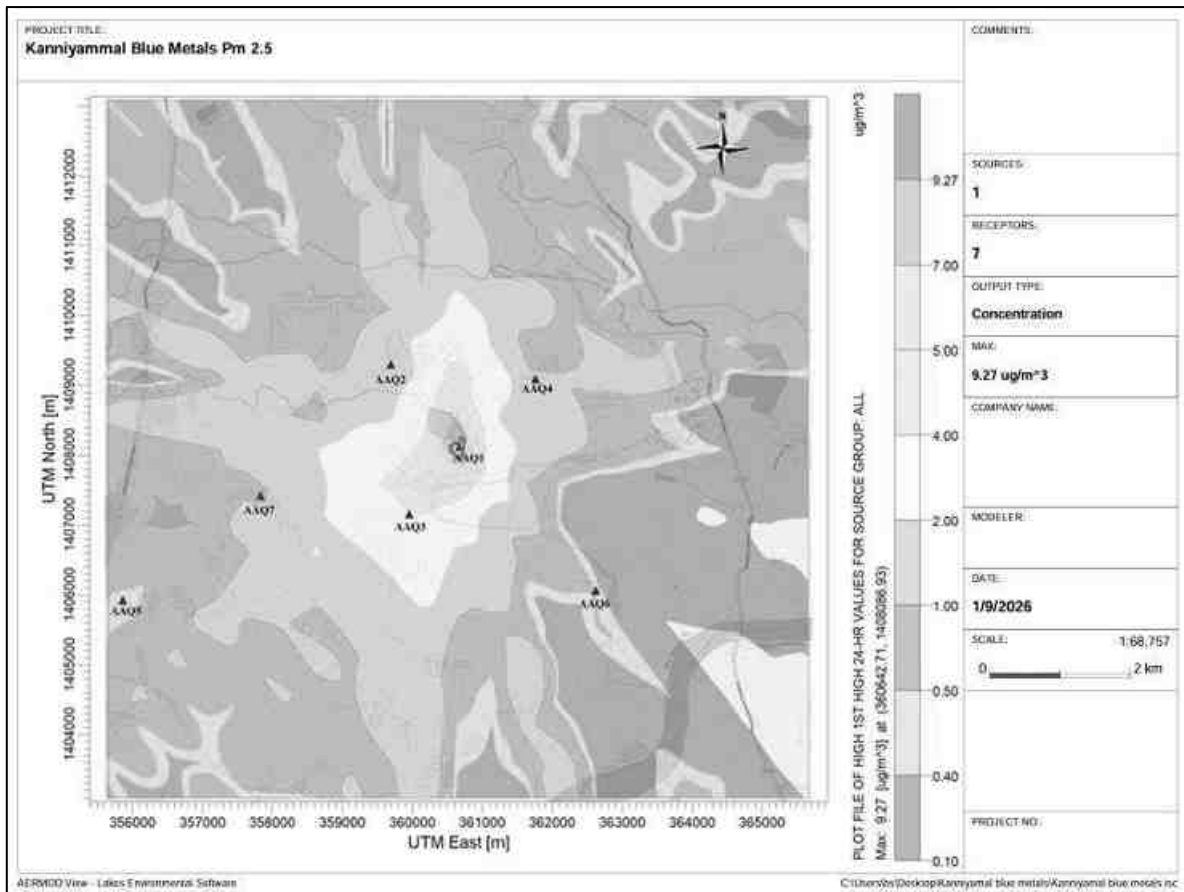


**Figure 4.1 Predicted Incremental Concentration of PM10**

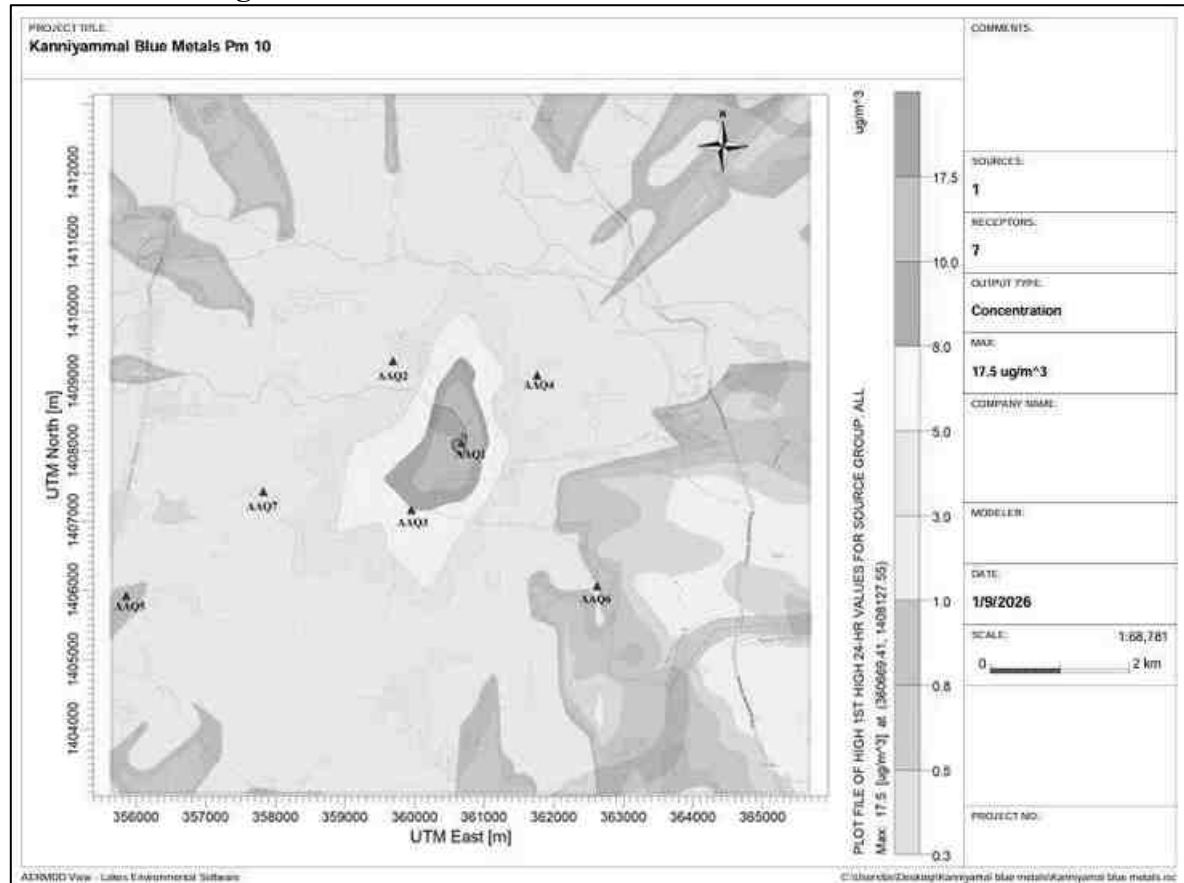


**Figure 4.2 Predicted Incremental Concentration of PM2.5**



In the present study American Meteorological Society and the United States Environmental Protection Agency Dispersion Model (AERMOD) air quality model was run for premonsoon season under maximum atmospheric temperature conditions. The AERMOD has been run for PM<sub>10</sub> and PM<sub>2.5</sub> distribution with 24-Hr maximum concentration and concentration contours were obtained as given in Figure 4.1 and 4.2. From these Isopleths plots it is observed that the highest pollutants concentrations predicted by AERMOD was near the major source in the core area and a maximum of 62.4µg/m<sup>3</sup> of PM<sub>10</sub> and 32.6µg/m<sup>3</sup> of PM<sub>2.5</sub> were found to be below the prescribed NAAQS near the source. The impact assessment matrix of PM<sub>2.5</sub> was tabled below

| Station | Impact Scale | Standard Compliance | Magnitude           |
|---------|--------------|---------------------|---------------------|
| AAQ1    | High         | Below Standard      | Significant (35.8%) |
| AAQ2    | Low          | Below Standard      | Negligible (5.0%)   |
| AAQ3    | Low          | Below Standard      | Negligible (2.6%)   |
| AAQ4    | Low          | Below Standard      | Negligible (2.4%)   |
| AAQ5    | Low          | Below Standard      | Negligible (4.8%)   |

#### Leopold Matrix: Air Quality Impact

The Leopold Matrix is used to cross-reference project activities against environmental factors. Based on the PM<sub>2.5</sub> data the project activities impact the environmental factor air quality. Scale: 1 (Lowest) to 10 (Highest). Magnitude is negative (-) for adverse impacts. Example for AAQ1 (Total 32.6µg/m<sup>3</sup>): If magnitude is -6 and importance is 6 the resulting -36 indicates a moderate negative impact that requires specific mitigation measures.

| Environmental Factor  | Project Activity: Construction | Project Activity: Operation |
|-----------------------|--------------------------------|-----------------------------|
| Physical: Air Quality | -4/5                           | -6/7                        |
| Biological: Health    | -3/4                           | -5/8                        |
| Social: Aesthetics    | -2/2                           | -3/4                        |

*Mitigation Measures: Air Quality Mitigation & Management Plan (2026).*

In accordance with 2026 **National Clean Air Programme (NCAP)** targets which aim for a 40% reduction in particulate matter by the end of 2026. These measures focus on reducing PM<sub>2.5</sub> at the source.

**Table 4.6 Proposed Mitigation Measures for Air pollution**

| Impacted Area      | Leopold Score (M/I) | Targeted Mitigation Measure | Implementation Frequency               |
|--------------------|---------------------|-----------------------------|----------------------------------------|
| AAQ1 (High Change) | -7 / 6              | Permanent Water sprinkler   | Continuous during high-dust activities |

|                  |        |                                                                                  |                                |
|------------------|--------|----------------------------------------------------------------------------------|--------------------------------|
| Core Area (AAQ2) | -5 / 8 | Install continuous wind-breaking walls (min. 3m height) to shield the core area. | Fixed throughout project phase |
| Transport Routes | -4 / 5 | Strictly enforce a 10 km/h limit for heavy vehicles to reduce dust resuspension. | All vehicle movements          |
| Stockpiles       | -3 / 4 | Use tarpaulins or plastic sheets to cover all sand, cement and loose debris.     | Daily at close of work         |
| Site Entry/Exit  | -2 / 3 | Tire wash unit to prevent track-out onto public roads.                           | Every vehicle exit             |

#### Compliance Requirements

- **Real-Time Monitoring:** As of 2026 large construction sites are required to link low-cost air quality sensors directly to state pollution control board (SPCB) dashboards for live compliance tracking.
- **Emission Norms:** Ensure all on-site machinery and diesel generators (DG sets) meet the latest BS-VI or equivalent standards to minimize  $PM_{2.5}$  and  $NO_x$  emissions.
- **Emergency Response:** If  $PM_{2.5}$  exceeds the  $60 \mu g/m^3$  limit trigger the Graded Response Action Plan (GRAP) which may require temporary suspension of excavation or demolition.

## 4.5 NOISE ENVIRONMENT

According to DGMS Technical Circular No. 18 of 1975 and No.5 of 1990 on “Protection of Workers against noise” it is brought to the knowledge of all concerned that Noise is emerging as an important and challenging health hazard for mine workers. Source data has been computed taking into account of all the machinery and activities used in the open cast mining process had listed in Table 4.7.

**Table 4.7 Activity and Noise Produced by Machinery in open cast mines**

| S. No. | Machinery / activity | Distance of measurement | Noise level dB(A) |                   |
|--------|----------------------|-------------------------|-------------------|-------------------|
|        |                      |                         | Idling            | Fully accelerated |
| 1.     | Jack hammer          | 1                       | 80                | 97                |
| 2.     | Compressor           | 1                       | -                 | 96                |
| 3.     | Bulldozer            | 2                       | 84                | 100               |
| 4.     | Tipper               | 2                       | 75                | 92                |
| 5.     | Drill                | 1                       | 85                | 90                |

The permissible noise exposure levels in Indian mines are based on OSHA standards adapted and enforced by the Indian government through the Factories Act and CPCB norms are given in Table 4.8 below.

**Table 4.8 Permissible noise levels adopted by CPCB, 2000 and OSHA**

| <b>Maximum Exposure Noise level Time per Working Day in hours</b> | <b>Noise level</b>                                            |                                                             |
|-------------------------------------------------------------------|---------------------------------------------------------------|-------------------------------------------------------------|
|                                                                   | <b>CPCB, 2000 in dB (International Standard Organization)</b> | <b>OSHA code in dB (Occupational Safety and Health Act)</b> |
| 8                                                                 | 90                                                            | 90                                                          |
| 4                                                                 | 93                                                            | 95                                                          |
| 2                                                                 | 96                                                            | 100                                                         |
| 1                                                                 | 99                                                            | 105                                                         |
| 0.5                                                               | 102                                                           | 110                                                         |
| 0.25                                                              | 105                                                           | 115                                                         |

A noise level of 90 dB causes disruption, leading to annoyance, cognitive errors, and temporary hearing loss, while 85 dB is considered an upper comfort level with potential for cognitive decrements in tasks requiring decision-making with hearing loss possible at 300-1200 Hz frequencies in that range. Prolonged exposure to sounds at or above 85 dB can damage hearing over time. The mitigation measures to minimize the noise pollution are given in Table below.

| <b>Impact</b>                                                                                                                                                                    | <b>Mitigation Measures</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p>Noise impact due to mining activities.</p> <p>Noise impact due to vehicular movement.</p> <p>Auditory impact (hearing impairment resulting from excessive noise exposure)</p> | <ul style="list-style-type: none"> <li>❖ Diesel powered machineries which are major source of noise in open cast environment will be properly maintained as per maintenance schedule to prevent undesirable noise.</li> <li>❖ Attention shall be paid towards rigorous maintenance of silencers of diesel engines.</li> <li>❖ Static diesel engines shall be housed as far as possible (not made of sheet metals or surrounded by baffles). If possible, they will be placed on vibration isolators.</li> <li>❖ Drill machine operators, blasters and dumper drivers will be issued earplugs and earmuffs. Duty hours of operators of noisy machinery will be regulated to keep their noise exposure levels within limits.</li> <li>❖ Provision of sound proof cabins for the workers deployed on machines producing higher level of sound like dumpers, shovels etc.</li> <li>❖ Proper maintenance, oiling and greasing of machines will be done every week to reduce generation of noise</li> </ul> |

|  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
|--|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|  | <ul style="list-style-type: none"> <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>❖ Greenbelt/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> <li>❖ Regular medical check-up and proper training to personnel to create awareness about adverse noise level effects.</li> </ul> |
|--|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

#### 4.5.1 Ground Vibrations due to blasting

The major source of ground vibration from the quarry is blasting. The ground vibrations due to the blasting in the quarry are calculated using 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          | 21.16                 | 670                     | 0.173       | 19                     | 0.05           | 128              |

**Table 4.10 Predicted PPV values due to Blasting at 100-500m 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          | 12.13                 | 100                  | 3.626       | 19                     | 0.51           | 148              |
|             |                       | 200                  | 1.196       |                        | 0.22           | 141              |

|  |  |     |       |  |      |     |
|--|--|-----|-------|--|------|-----|
|  |  | 300 | 0.625 |  | 0.14 | 137 |
|  |  | 400 | 0.395 |  | 0.10 | 134 |
|  |  | 500 | 0.276 |  | 0.07 | 131 |

The PPV results shows that the ground vibration is well below the permissible limits set by DGMS in the circular 7, 1997.

### ***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
- ❖ 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.
- ❖ Sufficient angular stemming material will be used to confine the explosive force and minimise environmental disturbance caused by venting / misfire.
- ❖ The detonators will be connected in a predetermined sequence to ensure that only one charge is detonated at any one time and a NONEL or similar type initiation system will be used
- ❖ The detonation delay sequence shall be designed so as to ensure that firing of the holes is in the direction of free faces so as to minimise vibration effects
- ❖ Vibration monitoring will be carried out every 6 months to check the efficacy of blasting practices.
- ❖ 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.

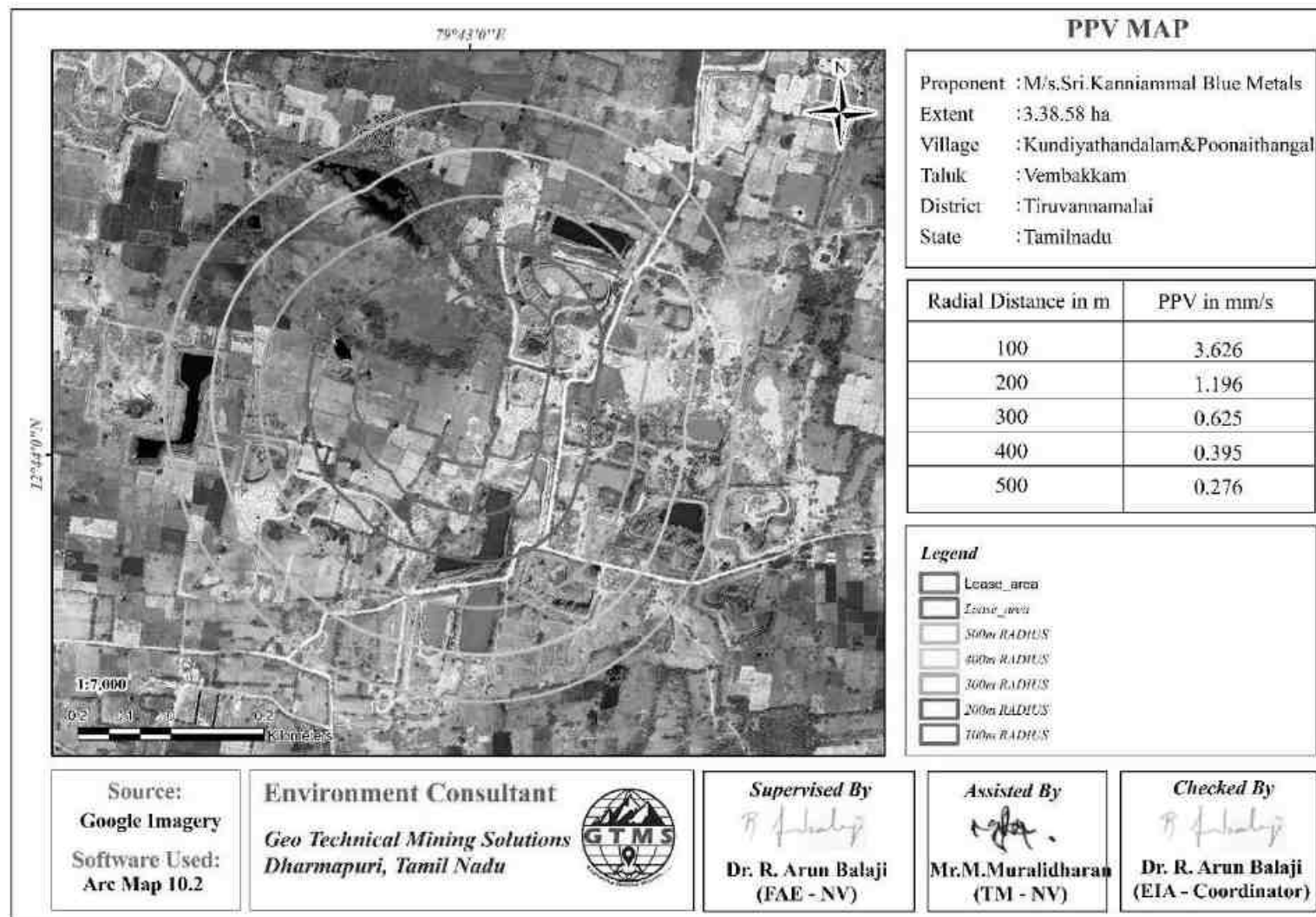


Figure 4.3 100-500m PPV Map

## 4.6 ECOLOGY AND BIODIVERSITY

### 4.6.1 Impact on Ecology and Biodiversity

- ❖ During loading the truck, dust generation will be likely. This shall be a temporary effect and not anticipated to affect the surrounding vegetation significantly
- ❖ The Number of plants in the mining lease area is given in Chapter III Table 3.21 which vegetation in the lease area may be affected during mining.
- ❖ Carbon released from quarrying machineries and tippers during quarrying would be 713kg per day, 192742kg per year and 963712kg over five years, as provided in Table 4.11.

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

|                                  | Per day | Per year | Per five years |
|----------------------------------|---------|----------|----------------|
| Fuel consumption of excavator    | 713     | 192742   | 963712         |
| Fuel consumption of tipper       | 944     | 254880   | 1274400        |
| Total fuel consumption in Liters | 1657    | 447390   | 2236950        |
| CO <sub>2</sub> emission in kg   | 4441    | 1199005  | 5995026        |

### 4.6.2 Mitigation Measures on Flora

- ❖ During conceptual stage, the top bench will be re-vegetated by planting local /native species and lower benches will be converted into rainwater harvesting structure following completion of mining activities, which will replace habitat resources for fauna species in this locality over a longer time.
- ❖ None of the plants in the lease area will be cut during operational phase of the mine. we recommend uprooting and planting of the 10 trees along the 7.5 m safety zone to prevent environmental pollution during quarrying. As the survival rate due to uprooting was only 30%, 100 seedlings will be procured at the rate of 10 seedlings per tree and planted in 7.5 m safety zone.
- ❖ Existing roads will be used and new roads will not be constructed to reduce impact on flora.
- ❖ Green belt of adequate width will develop around the project site. Dust catching species like *Alstonia scholaris*, *Bombax ceiba*, *Terminalia arjuna*, *Cassia fistula*, *Bombax ceiba*, *Azadirachta indica*, *Nyctanthes arbor-tristis*, *Psidium guajava*, *Tectona grandis* etc will be planted in green belt.
- ❖ 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 40500kg of carbon per year. Therefore, we recommend 500 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 4.13) about 1693 trees (Table 4.14) will be planted within three months from the beginning of mining. These trees, when grown up would sequester carbon of about 202500kg 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                      | 150   | 40500   | 202500  |
| Remaining CO <sub>2</sub> not sequestered in kg          | 4291  | 1158570 | 5792850 |
| Trees required for environmental compensation            | 19065 |         |         |
| Area required for environmental compensation in hectares | 38    |         |         |

**Table 4.13 Recommended Species for Greenbelt Development Plan**

| S. No | Botanical Name of the Plant  | Family Name | Common Name     | Category | Dust Capturing Efficiency Features                                                                                                                                                                |
|-------|------------------------------|-------------|-----------------|----------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1     | <i>Azadirachta indica</i>    | Meliaceae   | Neem,Vembu      | Tree     | Well distinct thick at both the layer<br>Well distinct in Palisade & Spongy parenchyma.<br>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 lebbeck</i>       | Fabaceae    | Vagai           | Tree     |                                                                                                                                                                                                   |
| 5     | <i>Delonix regia</i>         | Fabaceae    | Cemmayir-konrai | Tree     |                                                                                                                                                                                                   |
| 6     | <i>Bauhinia racemose</i>     | Fabaceae    | Aathi           | Tree     |                                                                                                                                                                                                   |
| 7     | <i>Cassia fistula</i>        | Fabaceae    | Sarakondrai     | Tree     |                                                                                                                                                                                                   |
| 8     | <i>Aegle marmelos</i>        | Fabaceae    | 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  |                                        |                                      |
|                                                 | 677                                          | 542                                    | 6094                                 |
|                                                 | Number of plants outside the mine lease area |                                        |                                      |
|                                                 | 1016                                         | 813                                    | 9142                                 |
| <b>Total</b>                                    | <b>1693</b>                                  | <b>1354</b>                            | <b>15236</b>                         |



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

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

#### ***Mitigation Measures on Fauna***

- ❖ Fencing will be constructed around the proposed mine lease area to restrict the entry of stray animals
- ❖ The workers shall be trained not to harm any wildlife near the project site
- ❖ The quarry operation using in NONAL blasting Method Technic so controlled in sound and vibration.

#### **4.6.4 *Impact on agriculture and horticulture crops in 1km Radius***

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

#### **4.6.5 *Mitigation Measures on agriculture and horticulture crops.***

- ❖ The main objective of the green belt is to provide a barrier between the source of pollution and the surrounding areas. In order to compensate the loss of vegetation cover, it is suggested to carry out afforestation program mainly inside and outside of the lease area in different phases.
- ❖ A green belt will be created in 7.5m & 10m safety zone around the quarry to contain the dust from the quarry and prevent the dust from spreading to the adjacent agricultural land.
- ❖ Transportation of material will be carried out during day time and material will be covered with tarpaulin

## 4.7 SOCIO ECONOMIC ENVIRONMENT

### *Anticipated Impact from Proposed and Existing Projects*

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

### *Common Mitigation Measures for Proposed Project*

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

## 4.8 OCCUPATIONAL HEALTH AND SAFETY

Social and occupational health mitigation is a critical requirement for projects showing a significant magnitude of change such as your 35.8% increase at AAQ1. Under updated Tamil Nadu Occupational Safety and Health Rules and NCAP 2026 targets the following measures are recommended.

### **Social & Worker Health Mitigation Plan**

| Category            | Mitigation Measure                                                                                        | Purpose                                         |
|---------------------|-----------------------------------------------------------------------------------------------------------|-------------------------------------------------|
| Respiratory Safety  | Mandatory N95/FFP2 Masks: Required for all workers during drilling and blasting, loading.                 | Prevent deep lung penetration of <i>PM2.5</i> . |
| Health Surveillance | Quarterly Health Camps: Conduct lung function tests (Spirometry) for workers in High Change zones (AAQ1). | Early detection of respiratory illness.         |

|                      |                                                                                                                                 |                                                   |
|----------------------|---------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------|
| Real-time Monitoring | Wearable AQ Sensors: Deploy wearable sensors for site supervisors in dust-heavy zones to track individual exposure.             | Immediate alerts for unhealthy exposure limits.   |
| Workplace Design     | Rotation & Scheduling: Limit individual work duration in high-pollution zones and shift dust-heavy work to cooler hours.        | Reduce cumulative pollutant load on workers.      |
| Community Engagement | Live AQ Dashboards: Install a public display board at the site entry showing current $PM_{2.5}$ vs. the $60\mu g/m^3$ standard. | Build transparency with local residents near AAQ2 |

#### 4.8.1 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 85dB(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 85dB(A) the peak sound levels reach 140dB(C) or the average maximum sound level reaches 110dB(A)
- ❖ Ear muffs provided will be capable of reducing sound levels at the ear to at least 85dB(A)
- ❖ Periodic medical hearing checks will be performed on workers exposed to high noise levels.

#### 4.8.2 Physical Hazards

The following measures are proposed for control of physical hazards

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

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

#### **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:

##### ***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.,

### ***Chemical Stability***

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

### ***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.

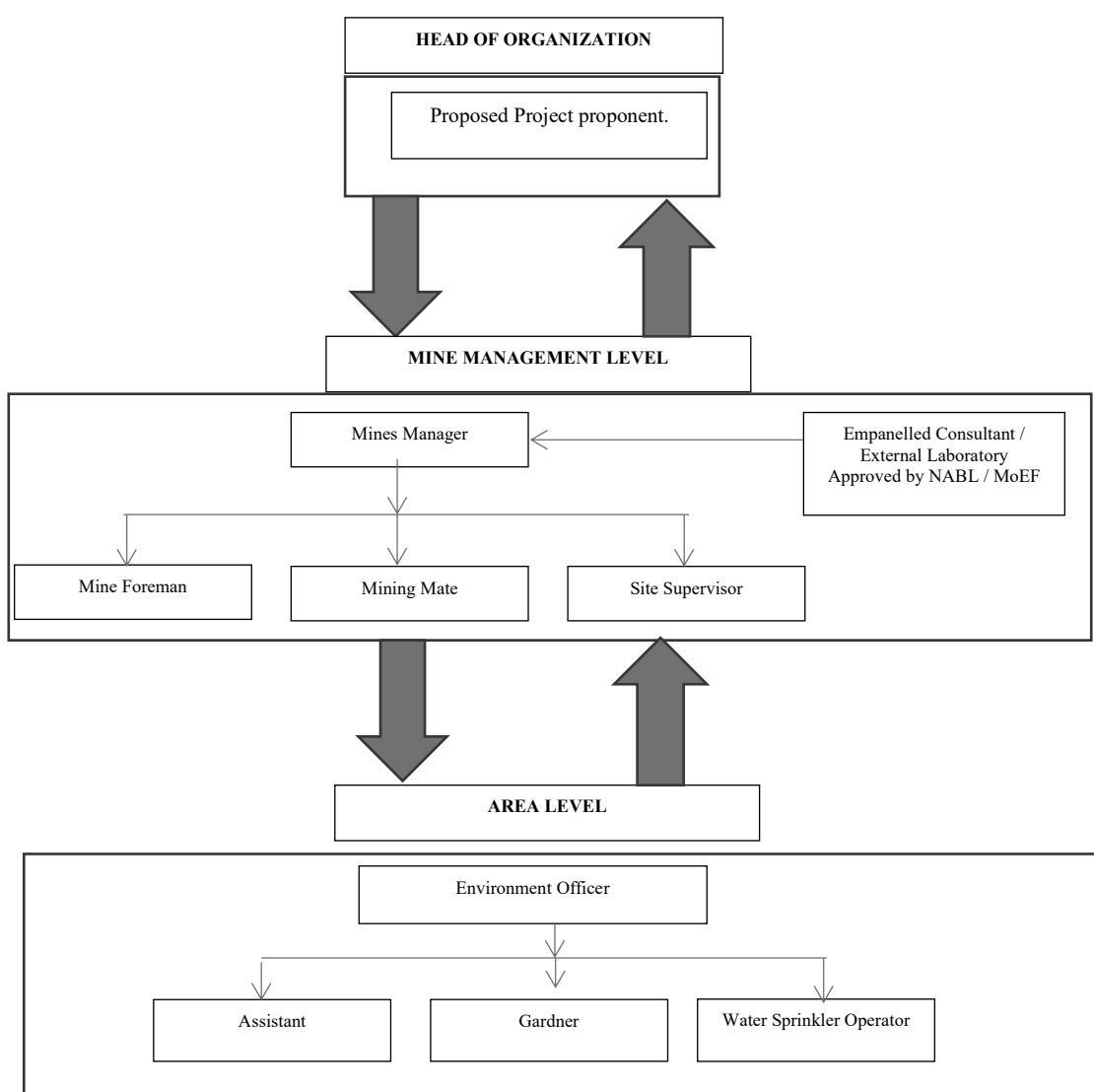


**Figure 6.1 Proposed Environmental Monitoring Chart**



## 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>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:

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

#### 7.1 PUBLIC CONSULTATION FOR PROPOSED PROJECT

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

#### 7.2 RISK ASSESSMENT FOR PROPOSED PROJECT

Risk Assessment is all about prevention of accidents and to take necessary steps to prevent it from happening. The methodology for the risk assessment is based on the specific risk assessment guidance issued by the Directorate General of Mine Safety (DGMS), Dhanbad, vide circular No.13 of 2002, dated 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 | Improper handling and | ✓ All safety precautions and provisions of Mine Act, 1952, Metalliferous Mines Regulation, |

|   |                           |                                                                                                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
|---|---------------------------|--------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|   | heavy mining machineries. | unsafe working practice                                                                                      | <p>1961 and Mines Rules, 1955 will be strictly followed during all mining operations.</p> <ul style="list-style-type: none"> <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> <li>✓ Periodical preventive maintenance and replacement of worn-out accessories in the</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                      |

|   |                |                                                                                                                                                                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
|---|----------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|   |                |                                                                                                                                                                          | <p>compressor and drill equipment as per operator manual.</p> <ul style="list-style-type: none"> <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 | Blasting       | <p>Fly rock, ground vibration, Noise and dust.</p> <p>Improper charging, stemming &amp; Blasting/ fining of blast holes</p> <p>Vibration due to movement of vehicles</p> | <ul style="list-style-type: none"> <li>✓ The maximum charge per delay and by optimum blast hole pattern, vibrations will be controlled within the permissible limit and blast can be conducted safely.</li> <li>✓ SOP for Charging, Stemming &amp; Blasting/Firing of Blast Holes will be followed by blasting crew during initial stage of operation</li> <li>✓ Shots are fired during daytime only.</li> <li>✓ All holes charged on any one day shall be fired on the same day.</li> <li>✓ The danger zone is and will be distinctly demarcated (by means of red flags)</li> </ul> |
| 4 | 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>      | <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> </ul>    |

|   |                                       |                                                        |                                                                                                                                                                                                         |
|---|---------------------------------------|--------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|   |                                       | Operator of truck leaving his cabin when it is loaded. | ✓ All vehicles should be fitted with reverse horn with one spotter at every tipping point<br>✓ Loading according to the vehicle capacity<br>✓ Periodical maintenance of vehicles as per operator manual |
| 5 | Natural calamities                    | Unexpected happenings                                  | ✓ Escape Routes will be provided to prevent inundation of storm water<br>✓ Fire Extinguishers & Sand buckets                                                                                            |
| 6 | Failure of Mine Benches and Pit Slope | Slope geometry, Geological structure                   | ✓ Ultimate or over all pit slope shall be below 60° and each bench height shall be 5m.                                                                                                                  |

*Source: Analysed and proposed by FAE & EC*

### 7.3 DISASTER MANAGEMENT PLAN FOR PROPOSED PROJECT

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

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

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

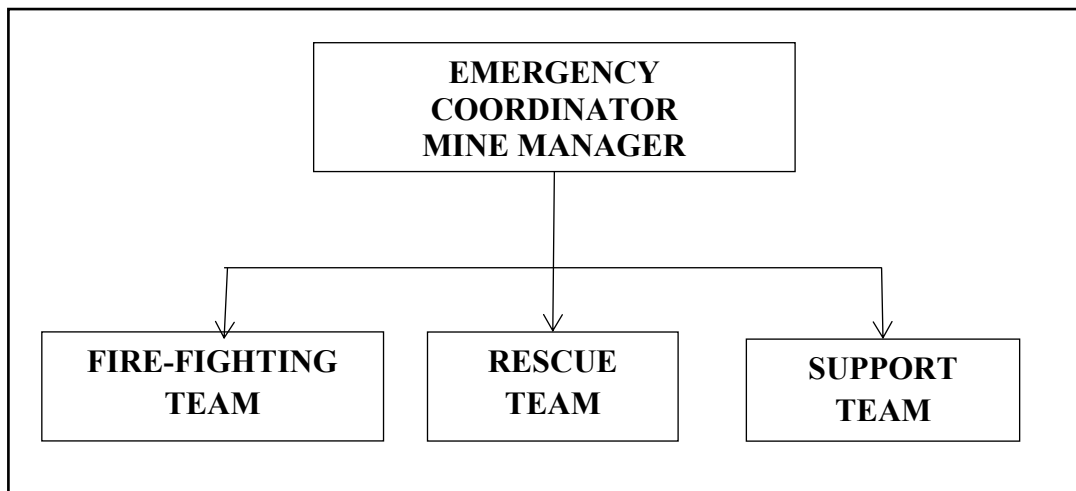


**Figure 7.1 Disaster management team layout for proposed project**

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

### **7.3.1 Emergency Control Procedure**

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

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



## 7.4 CUMULATIVE IMPACT STUDY

The Cumulative Impact is mainly anticipated due to drilling & blasting and excavation and transportation activities in all the projects within the cluster and major impact anticipated is on Air & Noise Environment and Ground Vibrations due to blasting. For this cumulative study, there is only one proposed project known as P1 is taken into consideration. The details of P1 have been given in Table 7.2, and E1, E2, E3, E4, E5, E6, E7, E8 & E9, are given in the Table 7.2 to 7.11.

**Table 7.2 Salient Features of the cluster Project 'P1'**

|                                  |                                                                                                                      |                              |                          |                           |
|----------------------------------|----------------------------------------------------------------------------------------------------------------------|------------------------------|--------------------------|---------------------------|
| Name of the Quarry               | M/s. Sri Kanniammal Blue Metals, Rough stone and gravel quarry                                                       |                              |                          |                           |
| Type of Land                     | Patta Land                                                                                                           |                              |                          |                           |
| Extent                           | 3.38.58 Ha                                                                                                           |                              |                          |                           |
| Toposheet No                     | 57-P/10                                                                                                              |                              |                          |                           |
| Location of Project Site         | 12°43'59.10"N to 12°44'8.20"N<br>79°42'55.27"E to 79°43'2.53"E                                                       |                              |                          |                           |
| Highest Elevation                | 94m AMSL                                                                                                             |                              |                          |                           |
| Proposed depth of Mining         | 45m BGL                                                                                                              |                              |                          |                           |
| Geological Resources             | Rough Stone in m <sup>3</sup>                                                                                        |                              | Gravel in m <sup>3</sup> |                           |
|                                  | m <sup>3</sup>                                                                                                       | Tons (m <sup>3</sup> * 2.75) | m <sup>3</sup>           | Tons (m <sup>3</sup> * 2) |
|                                  | 1523250                                                                                                              | 4188938                      | 169250                   | 338500                    |
| Mineable Reserves                | Rough Stone in m <sup>3</sup>                                                                                        |                              | Gravel in m <sup>3</sup> |                           |
|                                  | m <sup>3</sup>                                                                                                       | Tons (m <sup>3</sup> * 2.75) | m <sup>3</sup>           | Tons (m <sup>3</sup> * 2) |
|                                  | 296860                                                                                                               | 816368                       | 82550                    | 165100                    |
| Proposed reserves for five years | Rough Stone in m <sup>3</sup>                                                                                        |                              | Gravel in m <sup>3</sup> |                           |
|                                  | m <sup>3</sup>                                                                                                       | Tons (m <sup>3</sup> * 2.75) | m <sup>3</sup>           | Tons (m <sup>3</sup> * 2) |
|                                  | 296860                                                                                                               | 816368                       | 82550                    | 165100                    |
| Method of Mining                 | Open-Cast Mechanized mining                                                                                          |                              |                          |                           |
| Topography                       | Flat Topography                                                                                                      |                              |                          |                           |
| Machinery proposed               | Jack Hammer                                                                                                          |                              | 2                        |                           |
|                                  | Compressor                                                                                                           |                              | 2                        |                           |
|                                  | Tipper                                                                                                               |                              | 8                        |                           |
|                                  | Hydraulic Excavator                                                                                                  |                              | 2                        |                           |
| Blasting Method                  | The quarrying operation is proposed to carried out by open cast mining in conjunction with conventional method using |                              |                          |                           |

|                              |                                                                                     |
|------------------------------|-------------------------------------------------------------------------------------|
|                              | jack hammer drilling and blasting for shattering effect and loosen the rough stone. |
| Proposed Manpower Deployment | 22 Nos                                                                              |
| Project Cost                 | Rs.72,28,000/-                                                                      |
| CER Cost                     | Rs. 5,00,000/-                                                                      |
| Proposed Water Requirement   | 3.5 KLD                                                                             |

**Table 7.3 Salient Features of the cluster Project 'E1'**

|                                  |                                                                                                                                                                                                          |                                 |
|----------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------|
| Name of the Quarry               | K.Chandrasekaran Rough Stone & Gravel Quarry                                                                                                                                                             |                                 |
| Type of Land                     | Patta Land                                                                                                                                                                                               |                                 |
| Extent                           | 1.97.5 ha                                                                                                                                                                                                |                                 |
| Toposheet No                     | 57-P/10                                                                                                                                                                                                  |                                 |
| Location of Project Site         | 12°43'59.73"N to 12°44'06.66"N<br>79°43'01.36"E to 79°43'06.10"E                                                                                                                                         |                                 |
| Highest Elevation                | 97m AMSL                                                                                                                                                                                                 |                                 |
| Proposed depth of Mining         | 43m BGL                                                                                                                                                                                                  |                                 |
| Geological Resources             | Rough Stone in (m <sup>3</sup> & Ts)                                                                                                                                                                     | Gravel in (m <sup>3</sup> & Ts) |
|                                  | 766160 & 2106940                                                                                                                                                                                         | 57462 & 114924                  |
| Mineable Reserves                | Rough Stone in (m <sup>3</sup> & Ts)                                                                                                                                                                     | Gravel in (m <sup>3</sup> & Ts) |
|                                  | 154025 & 423569                                                                                                                                                                                          | 31899 & 63798                   |
| Proposed reserves for five years | Rough Stone in (m <sup>3</sup> & Ts)                                                                                                                                                                     | Gravel in (m <sup>3</sup> & Ts) |
|                                  | 154025 & 423569                                                                                                                                                                                          | 31899 & 63798                   |
| Method of Mining                 | Open-Cast Mechanized mining                                                                                                                                                                              |                                 |
| Topography                       | Flat Topography                                                                                                                                                                                          |                                 |
| Machinery proposed               | Jack Hammer                                                                                                                                                                                              | 8                               |
|                                  | Compressor                                                                                                                                                                                               | 2                               |
|                                  | Tipper                                                                                                                                                                                                   | 3                               |
|                                  | Hydraulic Excavator                                                                                                                                                                                      | 1                               |
| Blasting Method                  | The quarrying operation is proposed to carried out by open cast mining in conjunction with conventional method using jack hammer drilling and blasting for shattering effect and loosen the rough stone. |                                 |
| Proposed Manpower Deployment     | 29 Nos                                                                                                                                                                                                   |                                 |
| Project Cost                     | Rs.28,86,825/-                                                                                                                                                                                           |                                 |

|                            |                |
|----------------------------|----------------|
| CER Cost                   | Rs. 5,00,000/- |
| Proposed Water Requirement | 3.5 KLD        |

**Table 7.4 Salient Features of the cluster Project 'E2'**

|                                  |                                                                                                                                                                                                          |                                 |
|----------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------|
| Name of the Quarry               | M/s.Sri Tirumala Blue Metals, Rough stone and gravel quarry                                                                                                                                              |                                 |
| Type of Land                     | Patta Land                                                                                                                                                                                               |                                 |
| Extent                           | 2.98.5 ha                                                                                                                                                                                                |                                 |
| Toposheet No                     | 57-P/10                                                                                                                                                                                                  |                                 |
| Location of Project Site         | 12°43'58.90"N to 12°44'07.80"N<br>79°42'35.39"E to 79°42'42.77"E                                                                                                                                         |                                 |
| Highest Elevation                | 98m AMSL                                                                                                                                                                                                 |                                 |
| Proposed depth of Mining         | 43m BGL                                                                                                                                                                                                  |                                 |
| Geological Resources             | Rough Stone in (m <sup>3</sup> & Ts)                                                                                                                                                                     | Gravel in (m <sup>3</sup> & Ts) |
|                                  | 1194000 & 3283500                                                                                                                                                                                        | 89550 & 179100                  |
| Mineable Reserves                | Rough Stone in (m <sup>3</sup> & Ts)                                                                                                                                                                     | Gravel in (m <sup>3</sup> & Ts) |
|                                  | 425005 & 1168764                                                                                                                                                                                         | 68361 & 136722                  |
| Proposed reserves for five years | Rough Stone in (m <sup>3</sup> & Ts)                                                                                                                                                                     | Gravel in (m <sup>3</sup> & Ts) |
|                                  | 425005 & 1168764                                                                                                                                                                                         | 68361 & 136722                  |
| Method of Mining                 | Open-Cast Mechanized mining                                                                                                                                                                              |                                 |
| Topography                       | Plain terrain                                                                                                                                                                                            |                                 |
| Machinery proposed               | Jack Hammer                                                                                                                                                                                              | 10                              |
|                                  | Compressor                                                                                                                                                                                               | 3                               |
|                                  | Tipper                                                                                                                                                                                                   | 6                               |
|                                  | Hydraulic Excavator                                                                                                                                                                                      | 3                               |
| Blasting Method                  | The quarrying operation is proposed to carried out by open cast mining in conjunction with conventional method using jack hammer drilling and blasting for shattering effect and loosen the rough stone. |                                 |
| Proposed Manpower Deployment     | 48Nos                                                                                                                                                                                                    |                                 |
| Project Cost                     | Rs.72,09,000/-                                                                                                                                                                                           |                                 |
| CER Cost                         | Rs. 5,00,000/-                                                                                                                                                                                           |                                 |
| Proposed Water Requirement       | 3.5 KLD                                                                                                                                                                                                  |                                 |

**Table 7.5 Salient Features of the cluster Project 'E3'**

|                                  |                                                                                                                                                                                                          |                                 |
|----------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------|
| Name of the Quarry               | A.William, Rough stone & Gravel quarry                                                                                                                                                                   |                                 |
| Type of Land                     | Patta land                                                                                                                                                                                               |                                 |
| Extent                           | 2.41.0 ha                                                                                                                                                                                                |                                 |
| Toposheet No                     | 57-P/10                                                                                                                                                                                                  |                                 |
| Location of Project Site         | 12°44'06.24"N to 12°44'21.05"N<br>79°43'01.47"E to 79°43'05.11"E                                                                                                                                         |                                 |
| Highest Elevation                | 77m AMSL                                                                                                                                                                                                 |                                 |
| Proposed depth of Mining         | 28m BGL                                                                                                                                                                                                  |                                 |
| Geological Resources             | Rough Stone in (m <sup>3</sup> & Ts)                                                                                                                                                                     | Gravel in (m <sup>3</sup> & Ts) |
|                                  | 692200 & 1903550                                                                                                                                                                                         | 83064 & 166128                  |
| Mineable Reserves                | Rough Stone in (m <sup>3</sup> & Ts)                                                                                                                                                                     | Gravel in (m <sup>3</sup> & Ts) |
|                                  | 85250 & 234438                                                                                                                                                                                           | 28686 & 57372                   |
| Proposed reserves for five years | Rough Stone in (m <sup>3</sup> & Ts)                                                                                                                                                                     | Gravel in (m <sup>3</sup> & Ts) |
|                                  | 85250 & 234438                                                                                                                                                                                           | 28686 & 57372                   |
| Method of Mining                 | Open-Cast Mechanized mining                                                                                                                                                                              |                                 |
| Topography                       | Plain terrain                                                                                                                                                                                            |                                 |
| Machinery proposed               | Jack Hammer                                                                                                                                                                                              | 2                               |
|                                  | Compressor                                                                                                                                                                                               | 1                               |
|                                  | Tipper                                                                                                                                                                                                   | 1                               |
|                                  | Hydraulic Excavator                                                                                                                                                                                      | 1                               |
| Blasting Method                  | The quarrying operation is proposed to carried out by open cast mining in conjunction with conventional method using jack hammer drilling and blasting for shattering effect and loosen the rough stone. |                                 |
| Proposed Manpower Deployment     | 18 Nos                                                                                                                                                                                                   |                                 |
| Project Cost                     | Rs.37,01,720/-                                                                                                                                                                                           |                                 |
| CER Cost                         | Rs. 5,00,000/-                                                                                                                                                                                           |                                 |
| Proposed Water Requirement       | 3.0 KLD                                                                                                                                                                                                  |                                 |

**Table 7.6 Salient Features of the cluster Project 'E4'**

|                    |                                                            |
|--------------------|------------------------------------------------------------|
| Name of the Quarry | M/s.Bhuvaneswari Blue Metal, Rough stone and gravel quarry |
| Type of Land       | Patta Land                                                 |

|                                  |                                                                                                                                                                                                          |                                 |
|----------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------|
| Extent                           | 2.05.5 ha                                                                                                                                                                                                |                                 |
| Toposheet No                     | 57-P/10                                                                                                                                                                                                  |                                 |
| Location of Project Site         | 12°43'48.1"N to 12°43'53.6"N<br>79°43'02.02"E to 79°43'08.09"E                                                                                                                                           |                                 |
| Highest Elevation                | 100m AMSL                                                                                                                                                                                                |                                 |
| Proposed depth of Mining         | 40m BGL                                                                                                                                                                                                  |                                 |
| Geological Resources             | Rough Stone in (m <sup>3</sup> & Ts)                                                                                                                                                                     | Gravel in (m <sup>3</sup> & Ts) |
|                                  | 766840 & 2108810                                                                                                                                                                                         | 40360 & 80720                   |
| Mineable Reserves                | Rough Stone in (m <sup>3</sup> & Ts)                                                                                                                                                                     | Gravel in (m <sup>3</sup> & Ts) |
|                                  | 302309 & 831350                                                                                                                                                                                          | 30956 & 61912                   |
| Proposed reserves for five years | Rough Stone in (m <sup>3</sup> & Ts)                                                                                                                                                                     | Gravel in (m <sup>3</sup> & Ts) |
|                                  | 302309 & 831350                                                                                                                                                                                          | 30956 & 61912                   |
| Method of Mining                 | Open-Cast Mechanized mining                                                                                                                                                                              |                                 |
| Topography                       | Plain terrain                                                                                                                                                                                            |                                 |
| Machinery proposed               | Jack Hammer                                                                                                                                                                                              | 4                               |
|                                  | Compressor                                                                                                                                                                                               | 1                               |
|                                  | Tipper                                                                                                                                                                                                   | 5                               |
|                                  | Hydraulic Excavator                                                                                                                                                                                      | 1                               |
| Blasting Method                  | The quarrying operation is proposed to carried out by open cast mining in conjunction with conventional method using jack hammer drilling and blasting for shattering effect and loosen the rough stone. |                                 |
| Proposed Manpower Deployment     | 15 Nos                                                                                                                                                                                                   |                                 |
| Project Cost                     | Rs.39,80,250/-                                                                                                                                                                                           |                                 |
| CER Cost                         | Rs. 5,00,000/-                                                                                                                                                                                           |                                 |
| Proposed Water Requirement       | 5.0 KLD                                                                                                                                                                                                  |                                 |

**Table 7.7 Salient Features of the cluster Project 'E5'**

|                          |                                                                  |
|--------------------------|------------------------------------------------------------------|
| Name of the Quarry       | A.Dasarathan, Rough stone and gravel quarry                      |
| Type of Land             | Patta Land                                                       |
| Extent                   | 2.88.5 ha                                                        |
| Toposheet No             | 57-P/10                                                          |
| Location of Project Site | 12°43'42.20"N to 12°43'51.08"N<br>79°42'54.37"E to 79°42'59.68"E |

|                                  |                                                                                                                                                                                                          |                                 |
|----------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------|
| Highest Elevation                | 100m AMSL                                                                                                                                                                                                |                                 |
| Proposed depth of Mining         | 40m BGL                                                                                                                                                                                                  |                                 |
| Geological Resources             | Rough Stone in (m <sup>3</sup> & Ts)                                                                                                                                                                     | Gravel in (m <sup>3</sup> & Ts) |
|                                  | 1298250 & 3570188                                                                                                                                                                                        | 57700 & 115400                  |
| Mineable Reserves                | Rough Stone in (m <sup>3</sup> & Ts)                                                                                                                                                                     | Gravel in (m <sup>3</sup> & Ts) |
|                                  | 460700 & 1266925                                                                                                                                                                                         | 46462 & 92924                   |
| Proposed reserves for five years | Rough Stone in (m <sup>3</sup> & Ts)                                                                                                                                                                     | Gravel in (m <sup>3</sup> & Ts) |
|                                  | 460700 & 1266925                                                                                                                                                                                         | 46462 & 92924                   |
| Method of Mining                 | Open-Cast Mechanized mining                                                                                                                                                                              |                                 |
| Topography                       | Plain terrain                                                                                                                                                                                            |                                 |
| Machinery proposed               | Jack Hammer                                                                                                                                                                                              | 4                               |
|                                  | Compressor                                                                                                                                                                                               | 1                               |
|                                  | Tipper                                                                                                                                                                                                   | 5                               |
|                                  | Hydraulic Excavator                                                                                                                                                                                      | 1                               |
| Blasting Method                  | The quarrying operation is proposed to carried out by open cast mining in conjunction with conventional method using jack hammer drilling and blasting for shattering effect and loosen the rough stone. |                                 |
| Proposed Manpower Deployment     | 32 Nos                                                                                                                                                                                                   |                                 |
| Project Cost                     | Rs.52,19,015/-                                                                                                                                                                                           |                                 |
| CER Cost                         | Rs. 5,00,000/-                                                                                                                                                                                           |                                 |
| Proposed Water Requirement       | 3.0 KLD                                                                                                                                                                                                  |                                 |

**Table 7.8 Salient Features of the cluster Project 'E6'**

|                          |                                                                  |                                 |
|--------------------------|------------------------------------------------------------------|---------------------------------|
| Name of the Quarry       | K.Moorthy, Rough stone and gravel quarry                         |                                 |
| Type of Land             | Patta Land                                                       |                                 |
| Extent                   | 3.68.0 ha                                                        |                                 |
| Toposheet No             | 57-P/10                                                          |                                 |
| Location of Project Site | 12°43'53.51"N to 12°44'01.45"N<br>79°42'54.86"E to 79°43'05.68"E |                                 |
| Highest Elevation        | 78m AMSL                                                         |                                 |
| Proposed depth of Mining | 32m BGL                                                          |                                 |
| Geological Resources     | Rough Stone in (m <sup>3</sup> & Ts)                             | Gravel in (m <sup>3</sup> & Ts) |
|                          | 1104000 & 3036000                                                | 73600 & 147200                  |

|                                  |                                                                                                                                                                                                          |                                 |
|----------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------|
| Mineable Reserves                | Rough Stone in (m <sup>3</sup> & Ts)                                                                                                                                                                     | Gravel in (m <sup>3</sup> & Ts) |
|                                  | 273800 & 752950                                                                                                                                                                                          | 38404 & 76808                   |
| Proposed reserves for five years | Rough Stone in (m <sup>3</sup> & Ts)                                                                                                                                                                     | Gravel in (m <sup>3</sup> & Ts) |
|                                  | 273800 & 752950                                                                                                                                                                                          | 38404 & 76808                   |
| Method of Mining                 | Open-Cast Mechanized mining                                                                                                                                                                              |                                 |
| Topography                       | Plain terrain                                                                                                                                                                                            |                                 |
| Machinery proposed               | Jack Hammer                                                                                                                                                                                              | 2                               |
|                                  | Compressor                                                                                                                                                                                               | 2                               |
|                                  | Tipper                                                                                                                                                                                                   | 6                               |
|                                  | Hydraulic Excavator                                                                                                                                                                                      | 1                               |
| Blasting Method                  | The quarrying operation is proposed to carried out by open cast mining in conjunction with conventional method using jack hammer drilling and blasting for shattering effect and loosen the rough stone. |                                 |
| Proposed Manpower Deployment     | 21 Nos                                                                                                                                                                                                   |                                 |
| Project Cost                     | Rs.52,19,015/-                                                                                                                                                                                           |                                 |
| CER Cost                         | Rs. 5,00,000/-                                                                                                                                                                                           |                                 |
| Proposed Water Requirement       | 3.0 KLD                                                                                                                                                                                                  |                                 |

**Table 7.9 Salient Features of the cluster Project ‘E7’**

|                                  |                                                                             |                                 |
|----------------------------------|-----------------------------------------------------------------------------|---------------------------------|
| Name of the Quarry               | M/s.Shri Lakshmi Narayana Aggregates Pvt Ltd, Rough stone and gravel quarry |                                 |
| Type of Land                     | Patta Land                                                                  |                                 |
| Extent                           | 7.21.44 ha                                                                  |                                 |
| Toposheet No                     | 57-P/10                                                                     |                                 |
| Location of Project Site         | 12°43'49.09"N to 12°44'05.50"N<br>79°42'39.09"E to 79°42'49.98"E            |                                 |
| Highest Elevation                | 95m AMSL                                                                    |                                 |
| Proposed depth of Mining         | 28m BGL                                                                     |                                 |
| Geological Resources             | Rough Stone in (m <sup>3</sup> & Ts)                                        | Gravel in (m <sup>3</sup> & Ts) |
|                                  | 3604600 & 9912650                                                           | 144184 & 288368                 |
| Mineable Reserves                | Rough Stone in (m <sup>3</sup> & Ts)                                        | Gravel in (m <sup>3</sup> & Ts) |
|                                  | 1262575 & 3472081                                                           | 95868 & 191736                  |
| Proposed reserves for five years | Rough Stone in (m <sup>3</sup> & Ts)                                        | Gravel in (m <sup>3</sup> & Ts) |

|                              |                                                                                                                                                                                                          |                |
|------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------|
|                              | 893800 & 2457950                                                                                                                                                                                         | 95868 & 191736 |
| Method of Mining             | Open-Cast Mechanized mining                                                                                                                                                                              |                |
| Topography                   | Plain terrain                                                                                                                                                                                            |                |
| Machinery proposed           | Jack Hammer                                                                                                                                                                                              | 2              |
|                              | Compressor                                                                                                                                                                                               | 2              |
|                              | Tipper                                                                                                                                                                                                   | 6              |
|                              | Hydraulic Excavator                                                                                                                                                                                      | 1              |
| Blasting Method              | The quarrying operation is proposed to carried out by open cast mining in conjunction with conventional method using jack hammer drilling and blasting for shattering effect and loosen the rough stone. |                |
| Proposed Manpower Deployment | 27 Nos                                                                                                                                                                                                   |                |
| Project Cost                 | Rs.1,20,35,760/-                                                                                                                                                                                         |                |
| CER Cost                     | Rs. 5,00,000/-                                                                                                                                                                                           |                |
| Proposed Water Requirement   | 5.0 KLD                                                                                                                                                                                                  |                |

**Table 7.10 Salient Features of the cluster Project 'E8'**

|                                  |                                                                  |                                 |
|----------------------------------|------------------------------------------------------------------|---------------------------------|
| Name of the Quarry               | Tvl.Sri Tirumala Blue Metals, Rough stone and gravel quarry      |                                 |
| Type of Land                     | Patta Land                                                       |                                 |
| Extent                           | 4.44.35 ha                                                       |                                 |
| Toposheet No                     | 57-P/10                                                          |                                 |
| Location of Project Site         | 12°43'58.99"N to 12°44'09.61"N<br>79°42'32.68"E to 79°42'40.25"E |                                 |
| Highest Elevation                | 100m AMSL                                                        |                                 |
| Proposed depth of Mining         | 49m BGL                                                          |                                 |
| Geological Resources             | Rough Stone in (m <sup>3</sup> & Ts)                             | Gravel in (m <sup>3</sup> & Ts) |
|                                  | 1997415 & 5492891                                                | 133161 & 266322                 |
| Mineable Reserves                | Rough Stone in (m <sup>3</sup> & Ts)                             | Gravel in (m <sup>3</sup> & Ts) |
|                                  | 807050 & 2219388                                                 | 113073 & 226146                 |
| Proposed reserves for five years | Rough Stone in (m <sup>3</sup> & Ts)                             | Gravel in (m <sup>3</sup> & Ts) |
|                                  | 807050 & 2219388                                                 | 113073 & 226146                 |
| Method of Mining                 | Open-Cast Mechanized mining                                      |                                 |
| Topography                       | Plain terrain                                                    |                                 |



|                              |                                                                                                                                                                                                          |   |
|------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---|
| Machinery proposed           | Jack Hammer                                                                                                                                                                                              | 2 |
|                              | Compressor                                                                                                                                                                                               | 5 |
|                              | Tipper                                                                                                                                                                                                   | 4 |
|                              | Hydraulic Excavator                                                                                                                                                                                      | 2 |
| Blasting Method              | The quarrying operation is proposed to carried out by open cast mining in conjunction with conventional method using jack hammer drilling and blasting for shattering effect and loosen the rough stone. |   |
| Proposed Manpower Deployment | 33 Nos                                                                                                                                                                                                   |   |
| Project Cost                 | Rs.1,07,76,100/-                                                                                                                                                                                         |   |
| CER Cost                     | Rs. 5,00,000/-                                                                                                                                                                                           |   |
| Proposed Water Requirement   | 5.0 KLD                                                                                                                                                                                                  |   |

**Table 7.11 Salient Features of the cluster Project ‘E9’**

|                                  |                                                                     |                                 |
|----------------------------------|---------------------------------------------------------------------|---------------------------------|
| Name of the Quarry               | M/s. Aditya Durga Aggregates Pvt Ltd, Rough stone and gravel quarry |                                 |
| Type of Land                     | Patta Land                                                          |                                 |
| Extent                           | 4.87.88 ha                                                          |                                 |
| Toposheet No                     | 57-P/10                                                             |                                 |
| Location of Project Site         | 12°44'01.00"N to 12°44'10.34"N<br>79°42'44.25"E to 79°42'55.93"E    |                                 |
| Highest Elevation                | 99m AMSL                                                            |                                 |
| Proposed depth of Mining         | 27m BGL                                                             |                                 |
| Geological Resources             | Rough Stone in (m <sup>3</sup> & Ts)                                | Gravel in (m <sup>3</sup> & Ts) |
|                                  | 2197530 & 6043208                                                   | 48834 & 97668                   |
| Mineable Reserves                | Rough Stone in (m <sup>3</sup> & Ts)                                | Gravel in (m <sup>3</sup> & Ts) |
|                                  | 1019660 & 2804065                                                   | 39498 & 78996                   |
| Proposed reserves for five years | Rough Stone in (m <sup>3</sup> & Ts)                                | Gravel in (m <sup>3</sup> & Ts) |
|                                  | 700335 & 1925921                                                    | 39498 & 78996                   |
| Method of Mining                 | Open-Cast Mechanized mining                                         |                                 |
| Topography                       | Plain terrain                                                       |                                 |
| Machinery proposed               | Jack Hammer                                                         | 7                               |
|                                  | Compressor                                                          | 4                               |
|                                  | Tipper                                                              | 6                               |

|                              |                                                                                                                                                                                                          |   |
|------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---|
|                              | Hydraulic Excavator                                                                                                                                                                                      | 2 |
| Blasting Method              | The quarrying operation is proposed to carried out by open cast mining in conjunction with conventional method using jack hammer drilling and blasting for shattering effect and loosen the rough stone. |   |
| Proposed Manpower Deployment | 27 Nos                                                                                                                                                                                                   |   |
| Project Cost                 | Rs.1,00,51,520/-                                                                                                                                                                                         |   |
| CER Cost                     | Rs. 5,00,000/-                                                                                                                                                                                           |   |
| Proposed Water Requirement   | 5.0 KLD                                                                                                                                                                                                  |   |

#### 7.4.1 Air Environment

As the production of rough stone and gravel plays a vital role in affecting the air environment. The data on the cumulative production resulting from cluster project have been given in Tables 7.12.

**Table 7.12 Cumulative Production Load of Rough Stone**

| Quarry       | 5 Years<br>in<br>(m <sup>3</sup> ) | 5 Years in<br>Ts<br>(m <sup>3</sup> X 2.75) | Per Year<br>in<br>(m <sup>3</sup> ) | Per Year<br>in Ts<br>(m <sup>3</sup> X 2.75) | Per<br>Day in<br>(m <sup>3</sup> ) | Per Day in<br>Ts<br>(m <sup>3</sup> X 2.75) | Number of<br>Lorry Load<br>Per Day |
|--------------|------------------------------------|---------------------------------------------|-------------------------------------|----------------------------------------------|------------------------------------|---------------------------------------------|------------------------------------|
| P1           | 296860                             | 816368                                      | 59372                               | 163274                                       | 220                                | 605                                         | 37                                 |
| E1           | 154025                             | 423569                                      | 30805                               | 84714                                        | 114                                | 314                                         | 19                                 |
| E2           | 425005                             | 1168764                                     | 85001                               | 233753                                       | 315                                | 865                                         | 52                                 |
| E3           | 85250                              | 234438                                      | 17050                               | 46887                                        | 63                                 | 173                                         | 11                                 |
| E4           | 302309                             | 831350                                      | 60462                               | 166270                                       | 224                                | 616                                         | 37                                 |
| E5           | 460700                             | 1266925                                     | 92140                               | 253385                                       | 341                                | 938                                         | 57                                 |
| E6           | 273800                             | 752950                                      | 54760                               | 150590                                       | 203                                | 558                                         | 34                                 |
| E7           | 893800                             | 2457950                                     | 178760                              | 491590                                       | 662                                | 1820                                        | 110                                |
| E8           | 807050                             | 2219388                                     | 161410                              | 443877                                       | 597                                | 1643                                        | 99                                 |
| E9           | 700335                             | 1925921                                     | 140067                              | 385184                                       | 518                                | 1426                                        | 86                                 |
| <b>Total</b> | <b>4399134</b>                     | <b>12097623</b>                             | <b>879827</b>                       | <b>2419524</b>                               | <b>3257</b>                        | <b>8958</b>                                 | <b>542</b>                         |

**Table 7.13 Cumulative Production Load of Gravel**

| <b>Quarry</b>          | <b>Production<br/>n<br/>Year<br/>m<sup>3</sup></b> | <b>Production<br/>Year Ts<br/>(m<sup>3</sup> X 2)</b> | <b>Yearly<br/>Production<br/>m<sup>3</sup></b> | <b>Yearly<br/>Production<br/>Ts<br/>(m<sup>3</sup> X 2)</b> | <b>Daily<br/>Production<br/>m<sup>3</sup></b> | <b>Daily<br/>Production<br/>Ts<br/>(m<sup>3</sup> X 2)</b> | <b>Numbe<br/>r of<br/>Lorry<br/>Loads<br/>Per Day</b> |
|------------------------|----------------------------------------------------|-------------------------------------------------------|------------------------------------------------|-------------------------------------------------------------|-----------------------------------------------|------------------------------------------------------------|-------------------------------------------------------|
| P1                     | 82550                                              | 165100                                                | 27516                                          | 55033                                                       | 102                                           | 204                                                        | 17                                                    |
| E1                     | 31899                                              | 63798                                                 | 10633                                          | 21266                                                       | 38                                            | 79                                                         | 6                                                     |
| E2                     | 68361                                              | 136722                                                | 22787                                          | 45574                                                       | 84                                            | 168                                                        | 14                                                    |
| E3                     | 28686                                              | 57372                                                 | 9562                                           | 19124                                                       | 35                                            | 70                                                         | 6                                                     |
| E4                     | 30956                                              | 61912                                                 | 10318                                          | 20637                                                       | 38                                            | 76                                                         | 6                                                     |
| E5                     | 46462                                              | 92924                                                 | 15487                                          | 30974                                                       | 57                                            | 114                                                        | 10                                                    |
| E6                     | 38404                                              | 76808                                                 | 12801                                          | 25602                                                       | 47                                            | 94                                                         | 8                                                     |
| E7                     | 95868                                              | 191736                                                | 31956                                          | 63912                                                       | 118                                           | 235                                                        | 19                                                    |
| E8                     | 113073                                             | 226146                                                | 37691                                          | 75382                                                       | 139                                           | 279                                                        | 23                                                    |
| E9                     | 39498                                              | 78996                                                 | 13166                                          | 26332                                                       | 49                                            | 98                                                         | 8                                                     |
| <b>Grand<br/>Total</b> | <b>575757</b>                                      | <b>1151514</b>                                        | <b>191917</b>                                  | <b>383836</b>                                               | <b>707</b>                                    | <b>1417</b>                                                | <b>117</b>                                            |

The cumulative study shows that the overall production of rough stone from the proposed quarry is 3257m<sup>3</sup> & 8958 Ts per day with a capacity of 542 trips of rough stone per day and that production of gravel from the proposed quarry is 707m<sup>3</sup> & 1417 Ts per day accounting for 117trip/day.

#### 7.4.1.1 Cumulative Impact of Air Pollutants

The results on the cumulative impact of the cluster projects on air environment of the cluster have been provided in Table 7.14 The cumulative values resulting from the project for each pollutant do not exceed the permissible limits set by CPCB.

**Table 7.14 Cumulative impact results from the cluster projects**

| <b>Pollutants</b> | <b>Baseline Data (µg/m<sup>3</sup>)</b> | <b>Incremental Values (µg/m<sup>3</sup>)</b> | <b>Cumulative<br/>Value (µg/m<sup>3</sup>)</b> |
|-------------------|-----------------------------------------|----------------------------------------------|------------------------------------------------|
|                   |                                         | <b>P1</b>                                    |                                                |
| PM <sub>2.5</sub> | 18.17                                   | 9.27                                         | 27.44                                          |
| PM <sub>10</sub>  | 46.95                                   | 17.6                                         | 64.55                                          |

#### 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 projects within the 500m radius.

**Table.7.15 Cumulative impact of noise from cluster projects**

| Table 7.15 Cumulative Impact of Noise from cluster projects |              |           |                              |                         |                       |                                  |
|-------------------------------------------------------------|--------------|-----------|------------------------------|-------------------------|-----------------------|----------------------------------|
| 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                                          | 960          | SW        | 42.1                         | 24.31                   | 42.17                 | 55                               |
| Habitation Near E1                                          | 1029         | SW        |                              | 23.71                   | 42.16                 |                                  |
| Habitation Near E2                                          | 700          | S         |                              | 27.06                   | 42.23                 |                                  |
| Habitation Near E3                                          | 1230         | SW        |                              | 22.16                   | 42.14                 |                                  |
| Habitation Near E4                                          | 865          | SW        |                              | 25.22                   | 42.19                 |                                  |
| Habitation Near E5                                          | 545          | SW        |                              | 29.23                   | 42.32                 |                                  |
| Habitation Near E6                                          | 855          | SW        |                              | 25.32                   | 42.19                 |                                  |
| Habitation Near E7                                          | 440          | S         |                              | 31.09                   | 42.43                 |                                  |
| Habitation Near E8                                          | 710          | S         |                              | 26.93                   | 42.23                 |                                  |
| Habitation Near E9                                          | 810          | S         |                              | 25.79                   | 42.20                 |                                  |
| Cumulative Noise (dB (A))                                   |              |           |                              |                         | 52.6                  |                                  |

*Source: Lab Monitoring Data*

The cumulative analysis of noise due to cluster proposed projects shows that habitation will receive about 52.6dB (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 cluster projects have been shown in Table 7.16.

**Table 7.16 Cumulative effect of ground vibrations resulting from cluster projects**

| Location ID  | Maximum Charge in kgs | Nearest Habitation in m | PPV in mm/s  |
|--------------|-----------------------|-------------------------|--------------|
| P1           | 21.16                 | 960                     | 0.097        |
| E1           | 10.98                 | 1029                    | 0.051        |
| E2           | 30.29                 | 700                     | 0.215        |
| E3           | 6.08                  | 1230                    | 0.024        |
| E4           | 21.55                 | 865                     | 0.117        |
| E5           | 32.84                 | 545                     | 0.342        |
| E6           | 19.52                 | 855                     | 0.110        |
| E7           | 63.71                 | 440                     | 0.818        |
| E8           | 57.52                 | 710                     | 0.351        |
| E9           | 49.92                 | 810                     | 0.254        |
| <b>Total</b> |                       |                         | <b>2.379</b> |

Results from the above tables 7.8 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 cluster project were calculated and the results have been shown in Table 7.17. The cluster project will contribute Rs. 50,00,000/-towards CER fund.

**Table 7.17 Socio Economic benefits from the cluster project**

| Location ID        | Project Cost             | CER Cost               |
|--------------------|--------------------------|------------------------|
| P1                 | Rs.72,28,000/-           | Rs. 5,00,000/-         |
| E1                 | Rs.28,86,825/-           | Rs. 5,00,000/-         |
| E2                 | Rs.72,09,000/-           | Rs. 5,00,000/-         |
| E3                 | Rs.37,01,720/-           | Rs. 5,00,000/-         |
| E4                 | Rs.39,80,250/-           | Rs. 5,00,000/-         |
| E5                 | Rs.52,19,015/-           | Rs. 5,00,000/-         |
| E6                 | Rs.52,19,015/-           | Rs. 5,00,000/-         |
| E7                 | Rs.1,20,35,760/-         | Rs. 5,00,000/-         |
| E8                 | Rs.1,07,76,100/-         | Rs. 5,00,000/-         |
| E9                 | Rs.1,00,51,520/-         | Rs. 5,00,000/-         |
| <b>Grand Total</b> | <b>Rs. 6,83,07,205/-</b> | <b>Rs. 50,00,000/-</b> |

**Table 7.18 Employment benefits from the cluster projects**

| Location ID        | Employment |
|--------------------|------------|
| P1                 | 22         |
| E1                 | 29         |
| E2                 | 48         |
| E3                 | 18         |
| E4                 | 15         |
| E5                 | 32         |
| E6                 | 21         |
| E7                 | 27         |
| E8                 | 33         |
| E9                 | 27         |
| <b>Grand Total</b> | <b>272</b> |

A total of 272 people will get employment due to the cluster project in cluster

#### 7.4.4 Ecological Environment

**Table 7.19 Greenbelt Development Benefits from cluster Projects**

| Code         | Number of Trees proposed | Area to be covered (m <sup>2</sup> ) | No. of Trees expected to be grown @ 80% survival rate | Species recommended                                                               |
|--------------|--------------------------|--------------------------------------|-------------------------------------------------------|-----------------------------------------------------------------------------------|
| P1           | 1693                     | 15236                                | 1354                                                  | <i>Azadirachta indica, Albizia lebbeck, Delonix regia, Tectona grandis, etc.,</i> |
| E1           | 988                      | 8887                                 | 790                                                   |                                                                                   |
| E2           | 1493                     | 13433                                | 1194                                                  |                                                                                   |
| E3           | 1205                     | 10845                                | 964                                                   |                                                                                   |
| E4           | 1028                     | 9247                                 | 822                                                   |                                                                                   |
| E5           | 1443                     | 12983                                | 1154                                                  |                                                                                   |
| E6           | 1840                     | 16560                                | 1472                                                  |                                                                                   |
| E7           | 3607                     | 32465                                | 2886                                                  |                                                                                   |
| E8           | 2222                     | 19996                                | 1777                                                  |                                                                                   |
| E9           | 2439                     | 21955                                | 1952                                                  |                                                                                   |
| <b>Total</b> | <b>17958</b>             | <b>161607</b>                        | <b>14365</b>                                          |                                                                                   |

Cumulative studies show that the cluster Projects will plant about 17958 native tree species like *Azadirachta indica, Albizia lebbeck, Delonix regia, Tectona grandis*, etc inside and outside the lease area. It is expected that 80 % of trees, i.e., 14365 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 7.20.

**Table 7.20 Action Plan to Manage Plastic Waste**

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

*Source: Proposed by FAEs and EC*

## **CHAPTER VIII**

### **PROJECT BENEFITS**

#### **8.0 GENERAL**

The proposed project at Kundiyathandalam & Poonathangal Village aims to produce **296860m<sup>3</sup> & 816365 Ts** of rough stone and **82550m<sup>3</sup> & 165100 Ts 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 22 persons for carrying out mining operations and give preference to the local people in providing employment in this cluster. In addition, there will be an opportunity for indirect employment to the form of contractual jobs, business opportunities, and service facilities etc. Because of this, the economic status of the local people will improve.

#### **8.2 SOCIO-ECONOMIC WELFARE MEASURES PROPOSED**

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

#### **8.3 IMPROVEMENT IN PHYSICAL INFRASTRUCTURE**

The proposed quarry project is located in Kundiyathandalam & Poonathangal Village, Vembakkam Taluk, Tiruvannamalai District, Tamil Nadu. The area has already well-established communications roads and other facilities. The following physical infrastructure facilities will further improve due to proposed project.

- ❖ Road transport facilities
- ❖ Communications



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

#### **8.4 IMPROVEMENT IN SOCIAL INFRASTRUCTURE**

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

#### **8.5 OTHER TANGIBLE BENEFITS**

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

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

#### **8.6 CORPORATE SOCIAL RESPONSIBILITY**

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

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

- ❖ Health Services
- ❖ Social Development
- ❖ Infrastructure Development
- ❖ Education & Sports

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

## 8.7 CORPORATE ENVIRONMENT RESPONSIBILITY

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

**Table 8.1 CER Action Plan**

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

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

## 8.8 SUMMARY OF PROJECT BENEFITS

The project would pay about **Rs.3,81,08,240** to the state government through various ways, as provided in Table 8.2.

**Table 8.2 Project Benefits to the State Government**

| Particulars                                                                         | Budget for Rough Stone (Rs.) | Budget for Gravel (Rs.) |
|-------------------------------------------------------------------------------------|------------------------------|-------------------------|
| CER                                                                                 | 5,00,000                     |                         |
| Seigniorage @ Rs.90/m <sup>3</sup> of rough stone<br>Rs.56/m <sup>3</sup> of gravel | 26717400                     | 4622800                 |
| District Mineral Foundation Tax @ 10% of Seigniorage                                | 2671740                      | 462280                  |
| Green Tax @ 10% of Seigniorage                                                      | 2671740                      | 462280                  |
| <b>Total</b>                                                                        | <b>32560880</b>              | <b>5547360</b>          |

**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.Sri Kanniyammal Blue Metals will:

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

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

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

- ❖ Monitoring of the water/ waste water quality, air quality and solid waste generated.

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

## 10.2 Budgetary Provision for Environmental Management

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

**Table 10.1 EMP Budget for Proposed Project**

| Attribute       | Mitigation measures                                                         | Provision for Implementation                                                                                                   | Capital Cost | Recurring Cost/annum |
|-----------------|-----------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------|--------------|----------------------|
|                 |                                                                             |                                                                                                                                | (Rs.)        | (Rs.)                |
| Air Environment | Compaction, gradation and drainage on both sides                            | Rental Dozer & drainage construction on haul road @ Rs. 10,000/- per hectare and yearly maintenance @ Rs. 10,000/- per hectare | 33858        | 33858                |
|                 | 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 | 50000 | 5000  |
|  | No overloading of trucks/tippers/tractors                                                     | Manual Monitoring through Security guard                                                                        | 0     | 5000  |
|  | Stone carrying trucks will be covered by tarpaulin to avoid escape of fines to the atmosphere | Monitoring if trucks will be covered by tarpaulin                                                               | 0     | 10000 |
|  | Enforcing speed limits of 20 km/hr within ML area                                             | Installation of Speed Governors @ Rs. 5000/- per tipper/dumper deployed                                         | 40000 | 0     |
|  | Regular monitoring of exhaust fumes as per RTO norms                                          | Monitoring of Exhaust Fumes                                                                                     | 0     | 10000 |
|  | Regular sweeping and maintenance of roads for at least about 200 m from quarry entrance       | Provision for 2 labours @ Rs.10,000/labour (Contractual) / hectare                                              | 0     | 67716 |

|                              |                                                                                                                            |                                          |               |               |
|------------------------------|----------------------------------------------------------------------------------------------------------------------------|------------------------------------------|---------------|---------------|
|                              | Installing wheel wash system near exit gate of quarry                                                                      | Installation + Maintenance + Supervision | 50000         | 20000         |
| <b>Total Air Environment</b> |                                                                                                                            |                                          | <b>973858</b> | <b>256574</b> |
| <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            | 831208        |
| <b>Total Noise Environment</b> |                                                                                                                  |                                                                                                                                         | <b>50000</b> | <b>833208</b> |
| <b>Water Environment</b>       | Water Management                                                                                                 | Provision for garland drain @ Rs. 10,000/- per hectare with maintenance of Rs. 5,000/- per annum (2.96.5 X 10000)                       | 33858        | 16929         |
| <b>Total Water Environment</b> |                                                                                                                  |                                                                                                                                         | <b>33858</b> | <b>16929</b>  |
| <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>Total Waste Management</b>  |                                                                                                                  |                                                                                                                                         | <b>30000</b> | <b>22000</b>  |



|                                                |                                                                                                                                                                                          |                                                                                                                   |              |             |
|------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------|--------------|-------------|
| Implementation of EC, Mining Plan & DGMS       | 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        |
| <b>Total Implementation of EC, Mining Plan</b> |                                                                                                                                                                                          |                                                                                                                   | <b>10000</b> | <b>1000</b> |
| <b>Occupational Health and Safety</b>          | 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) | 88000        | 22000       |
|                                                | Health checkup for workers will be provisioned                                                                                                                                           | IME & PME Health checkup @ Rs. 1000/- per employee                                                                | 0            | 22000       |
|                                                | First aid facility will be provided                                                                                                                                                      | Provision of 2 Kits per Hectare @ Rs. 2000/-                                                                      | 0            | 13543       |
|                                                | 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 (2.28.0hectare)               | 677160       | 33858       |
|                                                | 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       | 169290       | 33858       |

|                                      |                                                                                                 |                                                                                                                                                                                                                                |        |        |
|--------------------------------------|-------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------|--------|
|                                      | Installation of CCTV cameras in the mines and mine entrance                                     | Camera 44 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 @ 40,000/- for Manager & @ 25,000/- for Foreman / Mate | 0      | 780000 |
| Total Occupational Health and Safety |                                                                                                 |                                                                                                                                                                                                                                | 974450 | 912259 |
| Development of Green Belt            | Green belt development - 500 trees per hectare (200 Inside Lease Area & 300 Outside Lease Area) | Site clearance, preparation of land, digging of pits /trenches, soil amendments, transplantation of saplings @ 200 per plant (capital) for plantation inside the lease area and @ 30 per plant maintenance (recurring))"       | 135432 | 20314  |
|                                      |                                                                                                 | Avenue Plantation @ 300 per plant (capital) for plantation outside the lease area and @ 30 per plant maintenance (recurring)                                                                                                   | 304722 | 30473  |
| Total Development of Green Belt      |                                                                                                 |                                                                                                                                                                                                                                | 440154 | 50787  |

|                     |                                                                                                                                                                                                                                   |                                                                                                            |                |                |
|---------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------|----------------|----------------|
| <b>Mine Closure</b> | Closure includes 10% of the amount allotted for Greenbelt development, wire fencing, and garland drainage (Rule 27 in MCDR 2017 for Cat B mines will pay 2 lakhs per hectare or minimum amount of financial assurance of 5 lakhs) |                                                                                                            | 115117         | 0              |
|                     | G.O.(Ms)No.23,<br>Dated: 28.09.2021                                                                                                                                                                                               | Section IVA of<br>TNMMCR 1959 (@10%<br>of Seigniorage Fee)<br>(Seigniorage Fee for<br>rough stone = Rs.90) | 3134020        | 0              |
| <b>TOTAL</b>        |                                                                                                                                                                                                                                   |                                                                                                            | <b>5646340</b> | <b>2092757</b> |

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

| <b>I<sup>st</sup><br/>Year</b> | <b>II<sup>nd</sup> Year</b> | <b>III<sup>rd</sup><br/>Year</b> | <b>IV<sup>th</sup><br/>Year</b> | <b>V<sup>th</sup><br/>Year</b> | <b>Total<br/>Recurring<br/>Cost</b> | <b>Total<br/>EMP<br/>Cost</b> |
|--------------------------------|-----------------------------|----------------------------------|---------------------------------|--------------------------------|-------------------------------------|-------------------------------|
| 2092757                        | 2197394                     | 2307264                          | 2422627                         | 2543759                        | <b>11563801</b>                     | <b>17210141</b>               |

In order to implement the environmental protection measures, an amount of **Rs.56,46,340** as capital cost and recurring cost as **Rs. 20,92,757** 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. 1,72,10,141** as shown in Table 10.2.

### **10.3 CONCLUSION**

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

## CHAPTER XI SUMMARY AND CONCLUSION

### 11.1 INTRODUCTION

As the proposed rough stone and gravel mining project (B1) falls within the quarry cluster of 500 m radius with the total extent of 1ha, it requires submission of EIA report for grant of Environmental Clearance (EC) after conducting public hearing. The proposed project falling in S.F. Nos. 162/1, 162/2A, 162/2B, 162/3, 162/4, 162/5A, 162/5B, 162/6, 162/7, 162/8, 162/10A1, 162/10A2, 162/10A3A, 162/10A3B, 117/12A2, & 144/1A, 144/2 over the extent of 3.38.58ha is situated in the cluster falling in Kundiyathandalam & Poonathangal Village, Vembakkam Taluk, Tiruvannamalai District. The projects involved in the calculation of cluster extent are of one proposed quarry and nine existing quarries.

### 11.2 PROJECT DESCRIPTION

The proposed project area is located between Latitudes 12°43'59.10"N to 12°44'8.20"N Longitudes from 79°42'55.27"E to 79°43'2.53"E in Kundiyathandalam & Poonathangal Village, Vembakkam Taluk, Tiruvannamalai District. According to the approved mining plan, about 296860m<sup>3</sup> & 816368 Ts of rough stone and 82550m<sup>3</sup> & 165100 Ts of gravel will be mined up to the depth of 45 m BGL in the five years. The quarrying operation is proposed to be carried out by open cast semi-mechanized mining method involving drilling and formation of benches of the prescribed dimensions.

### 11.3 DESCRIPTION OF THE ENVIRONMENT

Baseline data were collected to evaluate the existing environmental condition in the core and buffer areas during **October through December 2025** as per CPCB guidelines. The data were collected by both the FAEs and NABL accredited and MoEF notified **Interstellar Testing Centre Pvt. Ltd** for the environmental attributes including soil, water, noise, air and by FAEs for ecology and biodiversity, traffic, and socio-economy.

#### 11.3.1 Land Environment

The study area (10 km radius, approximately **32,100 ha**) around the proposed mine site was classified into seven **LULC classes** using Sentinel II imagery. The distribution is dominated by **crop land**, which accounts for over two-thirds of the area.

##### **Areal Coverage by LULC Class**

- Crop Land: The dominant feature, comprising the maximum area of 21,710ha (67.41%).
- Built-up Area: The second largest class covering 4,977 ha (15.45%).
- Fallow Land: FL Accounts for 3,007 ha (9.34%) of the landscape.

- Water Bodies: Including major flows and small tanks totalling 1,746 ha (5.42%).
- Mining Area: Covers 455.84 ha, representing the least percentage of the total area (1.42%).
- Sparse Vegetation: Covers 218 ha (0.68%).
- Barren Land: The smallest naturally occurring class, with 90 ha (0.28%).

#### LULC Statistics of the Study Area

| S. No.       | Classification   | 2025             |            |
|--------------|------------------|------------------|------------|
|              |                  | Area in Hectares | Area in %  |
| 1            | Water Bodies     | 1746.00          | 5.42       |
| 2            | Vegetation cover | 218.00           | 0.68       |
| 3            | Crop Lands       | 21710.00         | 67.41      |
| 4            | Mining area      | 455.84           | 1.42       |
| 5            | Built-up Area    | 4977.00          | 15.45      |
| 6            | Barren Land      | 90.00            | 0.28       |
| 7            | Fallow land      | 3007.00          | 9.34       |
| <b>Total</b> |                  | <b>32203.84</b>  | <b>100</b> |

Source: Sentinel II Satellite Imagery

#### 11.3.2 Soil Environment

The interpretation of the analytical results for the five soil samples (S1–S5) is as follows

| Parameter      | Result Range   | Interpretation                                                 |
|----------------|----------------|----------------------------------------------------------------|
| Organic Matter | 0.25 – 0.36%   | Critically Low. It requires heavy composting.                  |
| Nitrogen (N)   | 0.056 – 0.068% | Deficient and requires fertilization.                          |
| CEC            | 19.30 – 22.50  | Moderate/High shows good nutrient retention potential.         |
| pH             | 7.35 – 8.53    | Neutral to Alkaline except S4. S4 may need sulfur to lower pH. |
| Texture        | Sandy Loam     | Well-aerated but dries out quickly.                            |

These are hungry soils. They have a solid physical foundation and a good capacity to store nutrients (CEC) but they currently contain almost no organic fuel or essential nutrients (N-P-K). Significant application of organic manure and balanced N-P-K fertilizers is essential for any agricultural use.

The Total Organic Matter (TOM) and Total Organic Carbon (TOC) in soil samples indicates a critically depleted state that significantly limits agricultural productivity.

| Sample | TOC (%) | TOM (%) | Rating   |
|--------|---------|---------|----------|
| S1     | 0.16    | 0.276   | Very Low |
| S2     | 0.17    | 0.293   | Very Low |
| S3     | 0.19    | 0.327   | Very Low |
| S4     | 0.15    | 0.258   | Very Low |
| S5     | 0.21    | 0.362   | Very Low |

Productive agricultural topsoil typically contains 1–6% organic matter. Even the maximum observed value in Sample S5 (0.362%) remains significantly below the minimum threshold required for healthy soil biological activity, nutrient cycling, and structural stability. The organic matter values follow the **Van Bemmelen conversion factor**, where:

$$\text{TOM} \approx \text{TOC} \times 1.724$$

This calculation assumes that soil organic matter consists of approximately 58% organic carbon, which is a widely accepted standard in soil science.

### Agricultural Suitability Evaluation

Due to the dominant sandy loam texture, low organic matter content, and favorable drainage characteristics, the soil is more suitable for horticultural crops than for conventional wet-paddy cultivation.

| Feature              | Paddy Suitability                             | Horticulture Suitability                          |
|----------------------|-----------------------------------------------|---------------------------------------------------|
| Texture (Sandy Loam) | Low (Poor water retention)                    | High (Good drainage and aeration)                 |
| pH (7.35 – 8.53)     | Moderate (Paddy prefers acidic 5.5–6.5)       | High (Suitable for citrus, pomegranate, guava)    |
| Organic Matter       | Critically Low (Requires heavy organic input) | Low (Manageable with regular compost application) |
| Nutrients (NPK)      | Deficient (Requires heavy fertilization)      | Deficient (Requires balanced nutrient management) |

### Stress Relaxation Behaviour of Soil

Based on the sandy loam texture, very low organic matter content (<0.36%), and moderate cation exchange capacity (19.3–22.5 meq/100 g), the soil is expected to exhibit rapid initial stress relaxation followed by a relatively high residual stress.

Unlike organic-rich soils, which continue to relax over extended periods due to elastic organic matrices, the present soils show limited long-term stress dissipation capacity.

### Impact of Vehicular Movement on Soil Sample S1

The cumulative stress generated by repeated vehicle movement over soil sample S1 (Sandy Loam) significantly degrades soil quality by increasing the silt fraction and reducing particulate organic matter, which directly affects plant growth and soil functionality.

### Increase in Silt and Particulate Matter

Vehicle-induced stress physically alters soil texture through particle crushing and aggregate fragmentation:

- High dynamic stress from vehicle tires, concentrated within the top 0–20 cm soil layer, acts as a mechanical milling force.
- Larger sand grains ( $\approx 64.5\%$  in S1) and coarse particles collide and fracture under repeated pressure.
- This process shifts the grain-size distribution toward finer silt-sized particles.
- Surface-accumulated silt is easily resuspended by moving vehicles, increasing  $PM_{10}$  emissions and reducing available topsoil nutrients.

### Impact on Plant Growth

The gradual transformation toward a denser and silt-rich soil structure creates unfavorable growth conditions:

- Increasing silt content fills remaining macropores, rapidly increasing bulk density ( $\approx 1.0$ – $1.08$  g/cc).
- Higher soil strength restricts root elongation, leading to root impedance and shallow root systems.
- Fine pore dominance reduces aeration and drainage, causing oxygen deficiency (hypoxia) in the root zone.
- In soil sample S1, reduced aeration can decrease root respiration and potentially cause a 12–41% reduction in crop yield, depending on crop sensitivity.

### Preventive Measures for Soil Protection

To minimize siltation and compaction effects:

- **Surface contact pressure should be maintained below 150 kPa**
- Vehicle movement should be avoided when soil moisture is high (7–12%), as wet soil conditions act as a lubricant
- Moist soils accelerate particle breakdown and promote deep-seated compaction

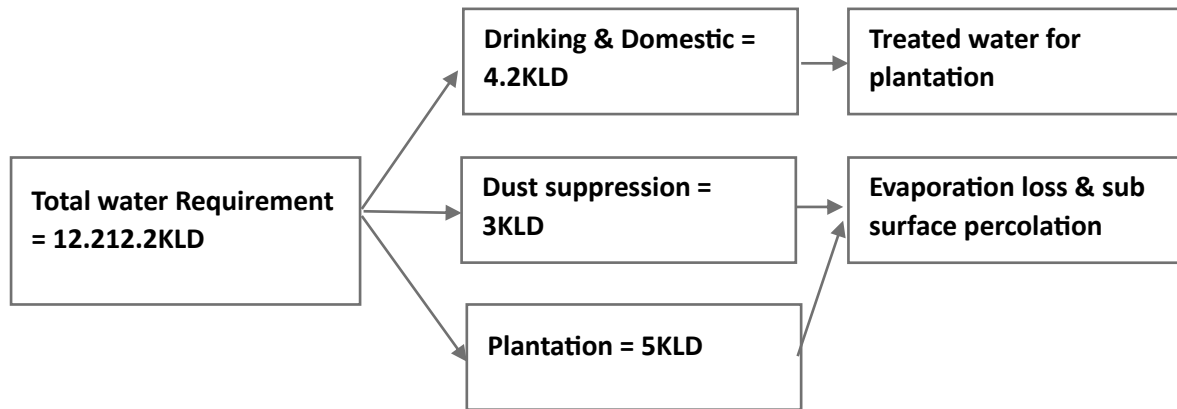
### Summary of Vehicular Stress Effects on Soil Sample S1

| Soil Component | Change Due to Stress                        | Effect on Plant Growth            |
|----------------|---------------------------------------------|-----------------------------------|
| Silt Content   | Increases due to grain crushing             | Restricts root penetration        |
| Bulk Density   | Increases rapidly                           | Reduces air and water movement    |
| Organic Matter | Fragmentation and accelerated decomposition | Loss of nutrient-holding capacity |
| Pore Structure | Loss of macropores                          | Causes root hypoxia               |

### 11.3.3 Water Environment

12.2KLD (12,200 liters per day) water requirement for drinking, domestic, dust suppression and plantation.

#### Water Balance Chart of the Mine



- ❖ The domestic effluents being generated during mine operation.
- ❖ Major impact of opencast mining on groundwater regime is quality deterioration. The proposed mining activities shall be carried out up to a depth of 45m from average ground level. The specific water table depth in the core and buffer zone is between 10.8m and 13.5 meters below ground level.
- ❖ The volume of rain water entering to the mine and accumulating in the quarry has been estimated on the basis of direct catchment area, maximum daily precipitation and the run-off coefficient.  $(Q = A \times H \times \bar{d}) \text{ cubic meters/day}$ .

Where A- catchment area in  $\text{m}^2$

H- Max daily precipitation in mm

$\bar{d}$ - Run-off Co-efficient.

The run off co-efficient for mined out area is 0.60. The all-time record for maximum daily precipitation in Tiruvannamalai district was 468mm on September 30, 2018 as reported by [CEIC Data](#). More recent rainfall records are 110mm on October 17, 2025. The maximum broken area is 1.95.50hectares in the sixth year and estimation for make of water done on the quarry parameters for sixth year onwards.

$$Q = 3.38.58 \text{hecatres} \times 10000 \times 0.175 \times 0.60 \text{ m}^3.$$

$$Q = 20314.8 \text{m}^3.$$

Total accumulated water in the pit is 20314.8 $\text{m}^3$ .

Additionally, 20% of water from seepage is 4062.96 $\text{m}^3$ .

Total water estimated for pumping requirement = 16251.8 $\text{m}^3$ .



If we take the all-time record then the total water estimated for pumping = 16251.8m<sup>3</sup>.

To manage rain water runoff into quarry a 5 HP diesel operated pump will be placed at the site during the monsoon.

#### 11.3.4 Air Environment

The study generated baseline data for four key parameters:

- Particulate Matter (PM2.5 and PM10): Fine and coarse inhalable particles.
- Gaseous Pollutants: Sulphur Dioxide (SO<sub>2</sub>) and Nitrogen Dioxide (NO<sub>x</sub>)

Table 3.15 summarizes the average concentrations of the four pollutants ((PM2.5, PM10, SO<sub>2</sub> and NO<sub>x</sub>) recorded across the five stations during the three-month period.

Figure 3.15 shows the map identifying the five specific sampling locations and Figures 3.16–3.20a give the graphical representations showing pollutant trends or comparisons for each monitoring station.

#### Summary of AAQ Result

##### Particulate Matter (µg/m<sup>3</sup>)

| Station ID | PM2.5 (Mean) | PM2.5 (98th %) | PM10 (Mean) | PM10 (98th %) |
|------------|--------------|----------------|-------------|---------------|
| AAQ1       | 24.40        | 26.32          | 63.78       | 68.43         |
| AAQ2       | 17.22        | 19.05          | 44.37       | 48.79         |
| AAQ3       | 17.42        | 18.03          | 44.88       | 49.58         |
| AAQ4       | 17.09        | 18.97          | 44.03       | 48.31         |
| AAQ5       | 16.62        | 17.92          | 42.82       | 46.17         |
| AAQ6       | 17.38        | 19.50          | 44.79       | 49.71         |
| AAQ7       | 17.1         | 18.6           | 43.98       | 48.36         |

##### Gaseous Pollutants (µg/m<sup>3</sup>)

| Station ID | SO <sub>2</sub> (Mean) | SO <sub>2</sub> (98th %) | NO <sub>x</sub> (Mean) | NO <sub>x</sub> (98th %) |
|------------|------------------------|--------------------------|------------------------|--------------------------|
| AAQ1       | 7.50                   | 7.87                     | 15.25                  | 16.38                    |
| AAQ2       | 5.27                   | 5.84                     | 10.54                  | 11.68                    |
| AAQ3       | 5.38                   | 5.90                     | 10.77                  | 11.80                    |
| AAQ4       | 5.25                   | 5.66                     | 10.56                  | 11.63                    |
| AAQ5       | 5.20                   | 5.39                     | 10.47                  | 11.01                    |
| AAQ6       | 5.39                   | 5.82                     | 10.78                  | 11.95                    |
| AAQ7       | 5.31                   | 5.59                     | 10.58                  | 10.80                    |

The station AAQ1 has the highest mean and 98th percentile for all four pollutants suggesting it may be located near a higher-intensity emission source like a major traffic intersection or industrial area. The **98th percentile** values represent the levels that 98% of the

data falls below. Since these values (e.g., PM<sub>2.5</sub> max of 26.32 µg/m<sup>3</sup> at AAQ1) are close to the mean it suggests a stable environment without extreme daily pollution spikes.

**Pollutant correlation:**

- The PM<sub>10</sub> levels (42.82– 68.43 µg/m<sup>3</sup>) are roughly 2.5 times higher than PM<sub>2.5</sub> levels, which is typical in areas where coarse dust (construction, road dust) contributes more than fine combustion particles.
- SO<sub>2</sub> and NO<sub>x</sub> levels are closely linked likely originating from common vehicular or industrial sources.

**11.3.5 Noise Environment**

Noise level in core zone was 58.8dB (A) Leq during day time and 45.1dB(A) Leq during night time. Noise levels recorded in buffer zone during day time varied from 39.9 to 43.6dB (A) Leq and during night time from 38.9 to 43.2dB (A) Leq. Thus, the noise level for industrial and residential area meets the requirements of CPCB.

**11.3.6 Biological Environment**

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

***Flora in core zone***

There are no trees, shrubs, herbs and grasses are not present in quarry mine lease area. It's an existing mine.

***Flora in 300 m radius zone***

Taxonomically, a total of 33 species belonging to 19 families have been recorded from the 300m radius from the mining lease area. The species in the 300m radius include herbs (18), trees (08), shrubs (05), the 19 families, Fabaceae and Lamiaceae are the main dominating species in the study area, Species Richness (margalef Index) in the study area it mentioned in Table 3.19-3.21 Moreover, no species are found as threatened category. There is government land around 300 meters. *Vachelia leucophylla* is the dominant tree followed by *Phoenix sylvestris* tree, *Carissa carandas*, *Casapella thevetia* and *Lantana camara* tree.

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

In the buffer zone, a total of 81 species belonging to 41 families were recorded. Among them are trees (32), shrubs (14), herbs (38), climbers (09), creepers (5), grasses (4), and cactus (1). Majority of the species belongs to the family of Fabaceae and Poaceae, as mentioned in

Table 3.28. Species Richness (margalef Index) in the study area it mentioned in Table 3.22. Moreover, no species are found as threatened category.

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

A total of 22 species belonging to 15 families were observed in the core zone (Table 3.24). Among them are 9 species of Insects, 3 species of Reptiles, 1 species of Mammals, and 9 species of Avian. None of these species are threatened or endemic in the study area and surroundings. There are no Schedule I species and 8 species are under schedule IV according to Indian wild life Act, 1972. There are no critically endangered, endangered, vulnerable and endemic species in the core zone.

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

A total of 44 species belonging to 34 families were recorded from the buffer area. Among them were 20 species of Birds, 13 species of Insects, 3 species of Reptiles, 1 species of Mammals, and 9 species of Amphibians, as mentioned in Table.3.25. There are four species under Schedule II and twenty-six species under schedule IV according to Indian wild life Act 1972. And there are no critically endangered, vulnerable and endemic species in the buffer area. There is no schedule I Species in study area and there are no critically endangered, endangered, vulnerable and endemic species.

### **11.3.7 Socio Economic Environment**

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

### **11.4 ENVIRONMENT MANAGEMENT PLAN**

In order to implement the environmental protection measures, an amount of **Rs.5646340** as capital cost and recurring cost as **Rs. 2092757** 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. 17210141**.

### **11.5 OVERALL STUDY AREA CONCLUSION**

The Environmental Impact Assessment (EIA) for the proposed rough stone and gravel quarry project in Kundiyathandalam & Poonathangal Village, Tiruvannamalai District, Tamil Nadu, has comprehensively evaluated the baseline environmental conditions and projected impacts associated with quarry operations. The study concludes that the project is environmentally sustainable with appropriate mitigation and management practices in place.

The land use analysis using Sentinel II imagery reveals that agricultural land dominates the study area, with limited urbanization and industrial activity. While minor land use changes are expected due to quarrying, these are localized and reversible.

The soil environment is assessed to be healthy and agriculturally productive, with good moisture retention, neutral to slightly alkaline pH, and moderate nutrient levels.

Surface and groundwater quality are generally good. Surface water meets all drinking and irrigation standards with minimal treatment, and groundwater is safe for consumption after mild treatment for hardness and taste. No microbial contamination was detected, and key parameters fall within permissible limits.

Air quality and noise levels are within Central Pollution Control Board (CPCB) norms, and the Air Quality Index remains causing minimal impact to human health. Quarrying impacts on air and noise can be effectively controlled through dust suppression, green belt development, and controlled blasting techniques.

The biological environment in the core zone shows limited flora and fauna due to existing quarry activity, but the buffer zone hosts a healthy diversity of species with no presence of endangered or migratory species. Green belt development and post-mining reclamation plans are proposed to enhance biodiversity and carbon sequestration.

The socio-economic environment will benefit from direct and indirect employment, infrastructure development, and improved livelihoods. The project also contributes to the local economy through taxes, royalty payments, and community development initiatives under Corporate Environmental Responsibility (CER).

Potential environmental impacts such as dust, noise, and runoff are anticipated but can be managed with the proposed Environment Management Plan (EMP). Adequate provisions have been made for water management, air pollution control, soil conservation, occupational health, and post-mining restoration. Risk assessment and a disaster management plan have been integrated to ensure safety and emergency preparedness.

Overall, the study concludes that the proposed quarry project is technically feasible, environmentally sound, and socio-economically beneficial. With strict implementation of the mitigation measures and monitoring programs, the project can proceed without causing significant adverse impacts on the environment or local communities.

## CHAPTER XII

### DISCLOSURES OF CONSULTANT

The Project Proponent, **M/s. Sri Kanniammal 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/<br>Empanelled          | Sector  | Functional Area | Category |
|--------------------------------------------------|--------------------|----------------------------------|---------|-----------------|----------|
| <b>Approved Functional Area Experts &amp; EC</b> |                    |                                  |         |                 |          |
| 1.                                               | Dr. R. Arunbalaji  | EIA Coordinator<br>(EC) In-house | 1(a)(i) | AQ              | B        |
| 2.                                               | G. Umamaheswaran   | In-house, FAE                    | 1(a)(i) | GEO             | B        |
| 3.                                               | G. Prithiviraj     | In-house, FAE                    | 1(a)(i) | LU              | B        |
| 4.                                               | G. Umamaheswaran   | In-house, FAE                    | 1(a)(i) | HG              | B        |
| 5.                                               | Dr.R.Arunbalaji    | In-house, FAE                    | 1(a)(i) | AP              | B        |
| 6.                                               | R.Revathy          | In-house, FAE                    | 1(a)(i) | WP              | B        |
| 7.                                               | Dr.R.Arunbalaji    | In-house, FAE                    | 1(a)(i) | NV              | B        |
| 8.                                               | J.Rajarajeshwari   | In-house, FAE                    | 1(a)(i) | SC, EB          | B        |
| 9.                                               | Dr. G. Prabakaran  | In-house, FAE                    | 1(a)(i) | SE              | B        |
| 10.                                              | J.N. Manikandan    | Empanelled FAE                   | 1(a)(i) | RH, SHW         | B        |
| <b>Approved Functional Area Associates</b>       |                    |                                  |         |                 |          |
| 11.                                              | R.Srikrishna       | FAA                              | 1(a)(i) | LU              | B        |
| 12.                                              | K.Prithivi         | FAA                              | 1(a)(i) | HG              | B        |
| 13.                                              | R.Srikrishna       | FAA                              | 1(a)(i) | Geo             | B        |
| <b>Team Members</b>                              |                    |                                  |         |                 |          |
| 14.                                              | G. Umamaheswaran   | TM                               | 1(a)(i) | TM for EC       | -        |

|     |                |    |         |                      |   |
|-----|----------------|----|---------|----------------------|---|
| 15. | M.Muralidharan | TM | 1(a)(i) | TM for FAE<br>NV, HW | - |
| 16. | A.Jothibas     | TM | 1(a)(i) | AP & AQ              | - |

### **DECLARATION BY EXPERTS CONTRIBUTING TO THE EIA & EMP**

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

Signature : 

Date :

Name : **Dr.R. Arun Balaji**

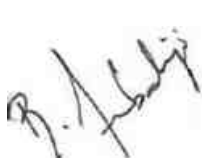
Designation : EIA Coordinator

Name of the EIA Consultant Organization : Geo Technical Mining Solutions

Period of Involvement : Till date

We, the FAEs, FAAs and TM hereby declare that information furnished in this EIA/EMP report for **M/s. Sri Kanniammal Blue Metals**, rough stone and gravel quarry project with the extent of 3.38.58ha situated in the cluster with the extent of 36.38.21ha in Kundiyathandalam & Poonathangal Village, Vembakkam Taluk, Tiruvannamalai District, and Tamil Nadu is true and correct to the best of our knowledge.

### **List of Functional Area Experts Engaged in this Project**

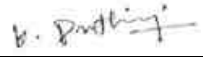
| S. No. | Functional Area | Involvement                                                                                                                                                                                                                          | Name of the Experts | Signature                                                                             |
|--------|-----------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------|---------------------------------------------------------------------------------------|
| 1      | AP              | <ul style="list-style-type: none"> <li>○ Identification of different sources of air pollution due to the proposed mine activity</li> <li>○ Prediction of air pollution and propose mitigation measures / control measures</li> </ul> | Dr.R.Arunbalaji     |  |
| 2      | WP              | <ul style="list-style-type: none"> <li>○ Suggesting water treatment systems, drainage facilities</li> <li>○ Evaluating probable impacts of effluent/waste water discharges into the receiving</li> </ul>                             | R.Revathy           |  |

|   |     |                                                                                                                                                                                                                                                                                                                      |                   |                                                                                       |
|---|-----|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------|---------------------------------------------------------------------------------------|
|   |     | environment/water bodies and suggesting control measures.                                                                                                                                                                                                                                                            |                   |                                                                                       |
| 3 | HG  | <ul style="list-style-type: none"> <li>○ Interpretation of ground water table and predict impact and propose mitigation measures.</li> <li>○ Analysis and description of aquifer Characteristics</li> </ul>                                                                                                          | G. Umamaheswaran  |    |
| 4 | GEO | <ul style="list-style-type: none"> <li>○ Field Survey for assessing the regional and local geology of the area.</li> <li>○ Preparation of mineral and geological maps.</li> <li>○ Geology and Geo morphological analysis/description and Stratigraphy/Lithology.</li> </ul>                                          | G. Umamaheswaran  |    |
| 5 | SE  | <ul style="list-style-type: none"> <li>○ Revision in secondary data as per Census of India, 2011.</li> <li>○ Impact Assessment &amp; Preventive Management Plan</li> <li>○ Corporate Environment Responsibility.</li> </ul>                                                                                          | Dr. G. Prabakaran |  |
| 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> | J.Rajarajeshwari  |  |
| 7 | RH  | <ul style="list-style-type: none"> <li>○ Identification of hazards and hazardous substances</li> </ul>                                                                                                                                                                                                               | J.N. Manikandan   |  |

|    |     |                                                                                                                                                                                                                                                  |                   |                                                                                       |
|----|-----|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------|---------------------------------------------------------------------------------------|
|    |     | <ul style="list-style-type: none"> <li>○ Risks and consequences analysis</li> <li>○ Vulnerability assessment</li> <li>○ Preparation of Emergency Preparedness Plan</li> <li>○ Management plan for safety.</li> </ul>                             |                   |                                                                                       |
| 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>                           | G. Prithiviraj    |    |
| 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>                                                                                              | J.Rajarajeshwari  |  |
| 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   |  |



**List of Functional Area Associate Engaged in this Project**

| S.No. | Name         | Functional Area | Involvement                                                                                                                                                | Signature                                                                           |
|-------|--------------|-----------------|------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| 1     | R.Srikrishna | LU              | <ul style="list-style-type: none"> <li>○ Site visit with FAE</li> <li>○ Provide inputs &amp; Assisting FAE for LU</li> </ul>                               |  |
| 2     | R.Srikrishna | 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> |  |
| 3     | K.Prithivi   | HG              | <ul style="list-style-type: none"> <li>○ Site visit with FAE</li> <li>○ Provide inputs &amp; Assisting FAE for HG</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. Sri Kanniammal Blue Metals**, rough stone and gravel quarry project with the extent of 3.38.58ha situated in the cluster with the extent of 36.38.21ha in Kundiyathandalam and Poonathangal Village, Vembakkam Taluk, Tiruvannamalai District, and Tamil Nadu is true and correct to the best of our knowledge.

Signature

:



Date

:

Name

: **Dr. S. Karuppannan**

Designation

: Managing Partner

Name of the EIA Consultant Organization

: Geo Technical Mining Solutions

NABET Certificate No & Issue Date

: NABET/EIA/23-26/RA 0319

Validity

: Till 31.12.2026



**File No: 12483**  
**Government of India**  
**Ministry of Environment, Forest and Climate Change**  
**(Issued by the State Environment Impact Assessment Authority(SEIAA),**  
**TAMIL NADU)**

\*\*\*



Dated 25/09/2025



To,

Mr.K. KUMAR  
M/s. Sri Kanniammal Blue Metals  
Proprietor, S/o.Kannaiyan,S.No's. 660/2A, 2C,2D, 660/1A, 1B,Aarpakkam Village, Walajabad  
Taluk,Kancheepuram District - 631603. TAMIL NADU.  
srikanniammal@gmail.com

**Subject:** Grant of Terms of Reference along with Public Hearing under the provision of the EIA Notification 2006-regarding.

**Sir/Madam,**

**Sub:** SEIAA-TN Proposed Rough Stone & Gravel quarry of M/s. Sri Kanniammal Blue Metals lease over an extent of 3.38.58 Ha at S.F.No. 162/1, 162/2A, 162/2B, 162/3, 162/4, 162/5A, 162/5B, 162/6, 162/7, 162/8, 162/10A1, 162/10A2, 162/10A3A, 162/10A3B in Kundiyahtandalam and 117/12A2, 144/1A,144/2 in Poonathangal Village, Vembakkam Taluk, Tiruvannamalai District, Tamil Nadu by **Mr. K. Kumar** - under project category – “B1” and Schedule S.No.1(a) “Mining of Minerals Projects” of EIA Notification, 2006, as amended – **ToR issued along with Public Hearing** - preparation of EIA report – Regarding.

**Ref:** 1. Online proposal No. SIA/TN/MIN/545425/2025, Dated: 19/07/2025.

2. Your application submitted for Terms of Reference dated: 21.07.2025.

3. Minutes of the 609th SEAC meeting held on 26.08.2025

4. Minutes of the 888th SEIAA meeting held on 17.09.2025.

2. The particulars of the proposal are as below :

|                                            |                                                                             |
|--------------------------------------------|-----------------------------------------------------------------------------|
| (i) TOR Identification No.                 | TO25B0108TN5856513N                                                         |
| (ii) File No.                              | 12483                                                                       |
| (iii) Clearance Type                       | TOR                                                                         |
| (iv) Category                              | B1                                                                          |
| (v) Project/Activity Included Schedule No. | 1(a) Mining of minerals,1(a) Mining of minerals                             |
| (vii) Name of Project                      | Kundiyahtandalam & Poonathangal Village Rough Stone and Gravel Mining Lease |
| (viii) Name of Company/Organization        | K KUMAR                                                                     |
| (ix) Location of Project (District, State) | TIRUVANNAMALAI, TAMIL NADU                                                  |

|                                            |       |
|--------------------------------------------|-------|
| (x) Issuing Authority                      | SEIAA |
| (xi) Applicability of General Conditions   | no    |
| (xii) Applicability of Specific Conditions | no    |

1. In view of the particulars given in the Para 1 above, the project proposal inter alia including Form-1 (Part A and B) were submitted to the SEIAA for an appraisal by the SEAC under the provision of EIA notification 2006 and its subsequent amendments.

2. The above-mentioned proposal has been considered by SEIAA in the meeting held on 17.09.2025. The minutes of the meeting and all the Application and documents submitted [viz. Form-1 Part A, Part B] are available on PARIVESH portal which can be accessed by scanning the QR Code above.

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

4. The SEIAA has examined the proposal in accordance with the Environment Impact Assessment (EIA) Notification, 2006 & further amendments thereto and after accepting the recommendations of the SEAC hereby decided to issue the following Terms of Reference with public hearing for instant proposal of **Mr. K. Kumar** under the provisions of EIA Notification, 2006 and as amended thereof.

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

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

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

8. The TORs with public hearing prescribed shall be valid for a period of three years from the date of issue, for submission of the EIA/EMP report as per OMNo.J-11013/41/2006-IA-II(I)(part) dated 29th August, 2017.

#### **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. Monitoring Cell, IA Division, Ministry of Environment, Forests & CC, Paryavaran Bhavan, CGO Complex, New Delhi 110003
5. The District Collector, Tiruvannamalai District.
6. Stock File.

#### **Annexure 1**

#### **Specific Terms of Reference for (Mining Of Minerals)**

##### **1. Seac Conditions - Site Specific**

| <b>S. No</b> | <b>Terms of Reference</b>                                                                                                                                                                                                                                                                 |
|--------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>1.1</b>   | <p><b><u>Major Condition:</u></b></p> <p>1. The PP shall leave 7.5m distance as safety barrier in case of patta land and 10m in case of government poramboke as per MMR, 1961 and the same shall be incorporated in the revised mining plan.</p> <p><b><u>Specific Condition:</u></b></p> |

| S. No | Terms of Reference                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
|-------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|       | <p>1. A Cluster Management Committee (CMC) shall be constituted including all the mines in the cluster as Committee Members for the effective management of the mining operation in the cluster through systematic &amp; scientific approach with appointment of statutory personnel, appropriate environmental monitoring, good maintenance of haul roads and village/panchayat roads, authorized blasting operation etc. The PP shall submit the following details in the form of an Affidavit during the EIA appraisal:</p> <p>(i) Copy of the agreement forming CMC.</p> <p>(ii) The Organisation chart of the Committee with defining the role of the members</p> <p>(iii) The 'Standard Operating Procedures' (SoP) executing the planned activities.</p> <p>2. The PP should submit an affidavit to follow the scientific formation of benches for 5m *5m properly during mining as per the approved mining plan.</p> <p>3. The PP shall install the CCTV camera for the continuous surveillance of mining activity &amp; furnish the photographic/videographic evidence along with the EIA report.</p> |

## 2. Seac Standard Conditions

| S. No | Terms of Reference                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
|-------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 2.1   | <p>1. In the case of existing/operating mines, a letter obtained from the concerned AD (Mines) shall be submitted and it shall include the following:</p> <p>(i) Original pit dimension</p> <p>(ii) Quantity achieved Vs EC Approved Quantity</p> <p>(iii) Balance Quantity as per Mineable Reserve calculated.</p> <p>(iv) Mined out Depth as on date Vs EC Permitted depth</p> <p>(v) Details of illegal/illicit mining</p> <p>(vi) Violation in the quarry during the past working.</p> <p>(vii) Quantity of material mined out outside the mine lease area</p> <p>(viii) Condition of Safety zone/benches</p> <p>(ix) Revised/Modified Mining Plan showing the benches of not exceeding 6 m height and ultimate depth of not exceeding 50m.</p> <p>2. Details of habitations around the proposed mining area and latest VAO certificate regarding the location of habitations within 300m radius from the periphery of the site.</p> <p>3. The proponent is requested to carry out a survey and enumerate on the structures located within the radius of (i) 50 m, (ii) 100 m, (iii) 200 m and (iv) 300 m (v) 500m shall be enumerated with details such as dwelling houses with number of occupants, whether it belongs to the owner (or) not, places of worship, industries, factories, sheds, etc with indicating the owner of the building, nature of construction, age of the building, number of residents, their profession and income, etc.</p> <p>4. The PP shall submit a detailed hydrological report indicating the impact of proposed quarrying operations on the waterbodies like lake, water tanks, etc are located within 1 km of the proposed quarry.</p> <p>5. The Proponent shall carry out Bio diversity study through reputed Institution and the same shall be included in EIA Report.</p> <p>6. The DFO letter stating that the proximity distance of Reserve Forests, Protected Areas, Sanctuaries, Tiger reserve etc., up to a radius of 25 km from the proposed site.</p> <p>7. In the case of proposed lease in an existing (or old) quarry where the benches are not formed (or) partially formed as per the approved Mining Plan, the Project Proponent (PP) shall the PP shall carry out the scientific studies to assess the slope stability of the working benches to be constructed and existing quarry wall, by involving any one of the reputed Research and Academic Institutions - CSIR-Central Institute of Mining &amp; Fuel Research / Dhanbad, NIRM/Bangalore, Division of Geotechnical Engineering-IIT-Madras, NIT-Dept of Mining Engg, Surathkal, and Anna University Chennai-CEG Campus. The PP shall submit a copy of the aforesaid report indicating the stability</p> |

| S. No | Terms of Reference                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
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|       | <p>status of the quarry wall and possible mitigation measures during the time of appraisal for obtaining the EC.</p> <p>8. However, in case of the fresh/virgin quarries, the Proponent shall submit a conceptual 'Slope Stability Plan' for the proposed quarry during the appraisal while obtaining the EC, when the depth of the working is extended beyond 30 m below ground level.</p> <p>9. The PP shall furnish the affidavit stating that the blasting operation in the proposed quarry is carried out by the statutory competent person as per the MMR 1961 such as blaster, mining mate, mine foreman, II/I Class mines manager appointed by the proponent.</p> <p>10. The PP shall present a conceptual design for carrying out only controlled blasting operation involving line drilling and muffle blasting in the proposed quarry such that the blast-induced ground vibrations are controlled as well as no fly rock travel beyond 30 m from the blast site.</p> <p>11. The EIA Coordinators shall obtain and furnish the details of quarry/quarries operated by the proponent in the past, either in the same location or elsewhere in the State with video and photographic evidences.</p> <p>12. If the proponent has already carried out the mining activity in the proposed mining lease area after 15.01.2016, then the proponent shall furnish the following details from AD/DD, mines,</p> <p>13. What was the period of the operation and stoppage of the earlier mines with last work permit issued by the AD/DD mines?</p> <p>14. Quantity of minerals mined out.<br/> Highest production achieved in any one year<br/> Detail of approved depth of mining.<br/> Actual depth of the mining achieved earlier.<br/> Name of the person already mined in that leases area.<br/> If EC and CTO already obtained, the copy of the same shall be submitted.<br/> Whether the mining was carried out as per the approved mine plan (or EC if issued) with stipulated benches.</p> <p>15. All corner coordinates of the mine lease area, superimposed on a High-Resolution Imagery/Topo sheet, topographic sheet, geomorphology, lithology and geology of the mining lease area should be provided. Such an Imagery of the proposed area should clearly show the land use and other ecological features of the study area (core and buffer zone).</p> <p>16. The PP shall carry out Drone video survey covering the cluster, green belt, fencing, etc.,</p> <p>17. The proponent shall furnish photographs of adequate fencing, green belt along the periphery including replantation of existing trees &amp; safety distance between the adjacent quarries &amp; water bodies nearby provided as per the approved mining plan.</p> <p>18. The Project Proponent shall provide the details of mineral reserves and mineable reserves, planned production capacity, proposed working methodology with justifications, the anticipated impacts of the mining operations on the surrounding environment, and the remedial measures for the same.</p> <p>19. The Project Proponent shall provide the Organization chart indicating the appointment of various statutory officials and other competent persons to be appointed as per the provisions of the Mines Act'1952 and the MMR, 1961 for carrying out the quarrying operations scientifically and systematically in order to ensure safety and to protect the environment.</p> <p>20. The Project Proponent shall conduct the hydro-geological study considering the contour map of the water table detailing the number of groundwater pumping &amp; open wells, and surface water bodies such as rivers, tanks, canals, ponds, etc. within 1 km (radius) along with the collected water level data for both monsoon and non-monsoon seasons from the PWD / TWAD so as to assess the impacts on the wells due to mining activity. Based on actual monitored data, it may clearly be shown whether working will intersect groundwater. Necessary data and documentation in this regard may be provided.</p> <p>21. The proponent shall furnish the baseline data for the environmental and ecological parameters with regard to surface water/ground water quality, air quality, soil quality &amp; flora/fauna including traffic/vehicular movement study.</p> |

| S. No | Terms of Reference                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
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|       | <p>22. The Proponent shall carry out the Cumulative impact study due to mining operations carried out in the quarry specifically with reference to the specific environment in terms of soil health, biodiversity, air pollution, water pollution, climate change and flood control &amp; health impacts. Accordingly, the Environment Management plan should be prepared keeping the concerned quarry and the surrounding habitations in the mind.</p> <p>23. Rain water harvesting management with recharging details along with water balance (both monsoon &amp; non-monsoon) be submitted.</p> <p>24. Land use of the study area delineating forest area, agricultural land, grazing land, wildlife sanctuary, national park, migratory routes of fauna, water bodies, human settlements and other ecological features should be indicated. Land use plan of the mine lease area should be prepared to encompass preoperational, operational and post operational phases and submitted. Impact, if any, of change of land use should be given.</p> <p>25. Details of the land for storage of Overburden/Waste Dumps (or) Rejects outside the mine lease, such as extent of land area, distance from mine lease, its land use, R&amp;R issues, if any, should be provided.</p> <p>26. Proximity to Areas declared as 'Critically Polluted' (or) the Project areas which attracts the court restrictions for mining operations, should also be indicated and where so required, clearance certifications from the prescribed Authorities, such as the TNPCB (or) Dept. of Geology and Mining should be secured and furnished to the effect that the proposed mining activities could be considered.</p> <p>27. Description of water conservation measures proposed to be adopted in the Project should be given. Details of rainwater harvesting proposed in the Project, if any, should be provided.</p> <p>28. Impact on local transport infrastructure due to the Project should be indicated.</p> <p>29. A tree survey study shall be carried out (nos., name of the species, age, diameter etc.,) both within the mining lease applied area &amp; 300m buffer zone and its management during mining activity.</p> <p>30. A detailed mine closure plan for the proposed project shall be included in EIA/EMP report which should be site-specific.</p> <p>31. As a part of the study of flora and fauna around the vicinity of the proposed site, the EIA coordinator shall strive to educate the local students on the importance of preserving local flora and fauna by involving them in the study, wherever possible.</p> <p>32. The purpose of Green belt around the project is to capture the fugitive emissions, carbon sequestration and to attenuate the noise generated, in addition to improving the aesthetics. A wide range of indigenous plant species should be planted as given in the appendix-I in consultation with the DFO, State Agriculture University. The plant species with dense/moderate canopy of native origin should be chosen. Species of small/medium/tall trees alternating with shrubs should be planted in a mixed manner.</p> <p>33. Taller/one year old Saplings raised in appropriate size of bags, preferably ecofriendly bags should be planted as per the advice of local forest authorities/botanist/Horticulturist with regard to site specific choices. The proponent shall earmark the greenbelt area with GPS coordinates all along the boundary of the project site with at least 3 meters wide and in between blocks in an organized manner</p> <p>34. A Disaster management Plan shall be prepared and included in the EIA/EMP Report for the complete life of the proposed quarry (or) till the end of the lease period.</p> <p>35. A Risk Assessment and management Plan shall be prepared and included in the EIA/EMP Report for the complete life of the proposed quarry (or) till the end of the lease period.</p> <p>36. Occupational Health impacts of the Project should be anticipated and the proposed preventive measures spelt out in detail. Details of pre-placement medical examination and periodical medical examination schedules should be incorporated in the EMP. The project specific occupational health mitigation measures with required facilities proposed in the mining area may be detailed.</p> <p>37. Public health implications of the Project and related activities for the population in the impact zone should be systematically evaluated and the proposed remedial measures should be detailed</p> |

| S. No | Terms of Reference                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
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|       | <p>along with budgetary allocations.</p> <p>38. The Socio-economic studies should be carried out within a 5 km buffer zone from the mining activity. Measures of socio-economic significance and influence to the local community proposed to be provided by the Project Proponent should be indicated. As far as possible, quantitative dimensions may be given with time frames for implementation.</p> <p>39. Details of litigation pending against the project, if any, with direction /order passed by any Court of Law against the Project should be given.</p> <p>40. Benefits of the Project if the Project is implemented should be spelt out. The benefits of the Project shall clearly indicate environmental, social, economic, employment potential, etc.</p> <p>41. If any quarrying operations were carried out in the proposed quarrying site for which now the EC is sought, the Project Proponent shall furnish the detailed compliance to EC conditions given in the previous EC with the site photographs which shall duly be certified by MoEF&amp;CC, Regional Office, Chennai (or) the concerned DEE/TNPCB.</p> <p>42. The PP shall prepare the EMP for the entire life of mine and also furnish the sworn affidavit stating to abide the EMP for the entire life of mine.</p> <p>43. Concealing any factual information or submission of false/fabricated data and failure to comply with any of the conditions mentioned above may result in withdrawal of this Terms of Conditions besides attracting penal provisions in the Environment (Protection) Act, 1986.</p> |

### 3. Seiaa Specific Conditions :

| S. No | Terms of Reference                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
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| 3.1   | <p>The authority noted that the subject was placed in the <b>609<sup>th</sup></b> SEAC-I meeting held on <b>26.08.2025</b>. After detailed discussions, the Authority accepts the recommendation of SEAC-I and decided to grant <b>Terms of Reference (ToR) along with Public Hearing for the quantity of 381425 m<sup>3</sup> of Rough Stone &amp; 89610 m<sup>3</sup> of Gravel up to the depth of 50m (BGL)</b> as per the approved mining plan, 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-I &amp; normal conditions &amp; the SEIAA Standard conditions.</p> |

### 4. Seiaa Standard Conditions :

| S. No | Terms of Reference                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
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| 4.1   | <p><b><u>Cluster Management Committee</u></b></p> <p>1. Cluster Management Committee shall be framed which must include all the proponents in the cluster as members including the existing as well as proposed quarry.</p> <p>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.,</p> <p>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.</p> <p>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.</p> <p>5. The committee shall deliberate on risk &amp; emergency management plan, fire safety &amp; evacuation plan and sustainable development goals 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.</p> <p>6. The Cluster Management Committee shall form Environmental Policy to practice sustainable</p> |

| S. No | Terms of Reference                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
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|       | <p>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 in the EIA Report.</p> <p>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.</p> <p>8. The committee shall deliberate on the health of the workers/staff involved in the mining as well as the health of the public in the vicinity.</p> <p><b><u>Agriculture &amp; Agro-Biodiversity</u></b></p> <p>9. Impact on surrounding agricultural fields around the proposed mining Area.</p> <p>10. Impact on soil flora &amp; vegetation around the project site.</p> <p>11. Details of type of vegetation including no. of trees &amp; shrubs within the proposed mining area and. If so, transplantation of such vegetation all along the boundary of the proposed mining area shall committed mentioned in EMP.</p> <p>12. The Environmental Impact Assessment should study the agro-biodiversity, agro- forestry, horticultural plantations, the natural ecosystem, the soil micro flora, fauna and soil seed banks and suggest measures to maintain the natural Ecosystem.</p> <p>13. Action should specifically suggest for sustainable management of the area and restoration of ecosystem for flow of goods and services.</p> <p>14. The project proponent shall study and furnish the impact of project on plantations in adjoining patta lands, Horticulture, Agriculture and livestock.</p> <p><b><u>Forests</u></b></p> <p>15. The project proponent shall detailed study on impact of mining on Reserve forests and free ranging wildlife.</p> <p>16. The Environmental Impact Assessment should study impact on forest, vegetation, endemic, vulnerable and endangered indigenous flora and fauna.</p> <p>17. The Environmental Impact Assessment should study impact on standing trees and the existing trees should be numbered and action suggested for protection.</p> <p>18. The Environmental Impact Assessment should study impact on protected areas, Reserve Forests, National Parks, Corridors and Wildlife pathways, near project site.</p> <p><b><u>Water Environment</u></b></p> <p>19. Hydro-geological study considering the contour map of the water table detailing the number of ground water pumping &amp; 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.</p> <p>20. Erosion Control measures.</p> <p>21. 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, &amp; any ecological fragile areas.</p> <p>22. The project proponent shall study impact on fish habitats and the food WEB/ food chain in the water body and Reservoir.</p> <p>23. The project proponent shall study and furnish the details on potential fragmentation impact on natural Environment, by the activities.</p> <p>24. 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.</p> <p>25. The Terms of Reference should specifically study impact on soil health, soil erosion, the soil physical, chemical components and microbial components.</p> <p>26. The Environmental Impact Assessment should study on wetlands, water bodies, rivers streams, lakes and farmer sites.</p> <p>27. The EIA shall include the impact of mining activity on the following:</p> <p>a) Hydrothermal/Geothermal effect due to destruction in the Environment.</p> |



| S. No | Terms of Reference                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
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|       | <p>b) Bio-geochemical processes and its foot prints including Environmental stress.</p> <p>c) Sediment geochemistry in the surface streams.</p> <p><b><u>Energy</u></b></p> <p>28. The measures taken to control Noise, Air, Water, Dust Control and steps adopted to efficiently utilise the Energy shall be furnished.</p> <p><b><u>Climate Change</u></b></p> <p>29. 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.</p> <p>30. The Environmental Impact Assessment should study impact on climate change, temperature rise, pollution and above soil &amp; below soil carbon stock, soil health and physical, chemical &amp; biological soil features.</p> <p>31. Impact of mining on pollution leading to GHGs emissions and the impact of the same on the local livelihood.</p> <p><b><u>Mine Closure Plan</u></b></p> <p>32. Detailed Mine Closure Plan covering the entire mine lease period as per precise area communication order issued.</p> <p><b><u>EMP</u></b></p> <p>33. Detailed Environment Management Plan along with adaptation, mitigation &amp; remedial strategies covering the entire mine lease period as per precise area communication order issued and the scope for achieving SDGs.</p> <p>34. The Environmental Impact Assessment should hold detailed study on EMP with budget for Green belt development and mine closure plan including disaster management plan.</p> <p><b><u>Risk Assessment</u></b></p> <p>35. To furnish risk assessment and management plan including anticipated vulnerabilities during operational and post operational phases of Mining.</p> <p><b><u>Disaster Management Plan</u></b></p> <p>36. To furnish disaster management plan and disaster mitigation measures in regard to all aspects to avoid/reduce vulnerability to hazards &amp; to cope with disaster/untoward accidents in &amp; around the proposed mine lease area due to the proposed method of mining activity &amp; its related activities covering the entire mine lease period as per precise area communication order issued.</p> <p><b><u>Others</u></b></p> <p>37. 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.</p> <p>38. As per the MoEF&amp; 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.</p> <p>39. 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 &amp; microplastics on aquatic Environment and fresh water systems due to activities, contemplated during mining may be investigated and reported.</p> |

**Standard Terms of Reference for (Mining of minerals)**

1.

| S. No | Terms of Reference                                                                                                                                                                              |
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| 1.1   | 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 |

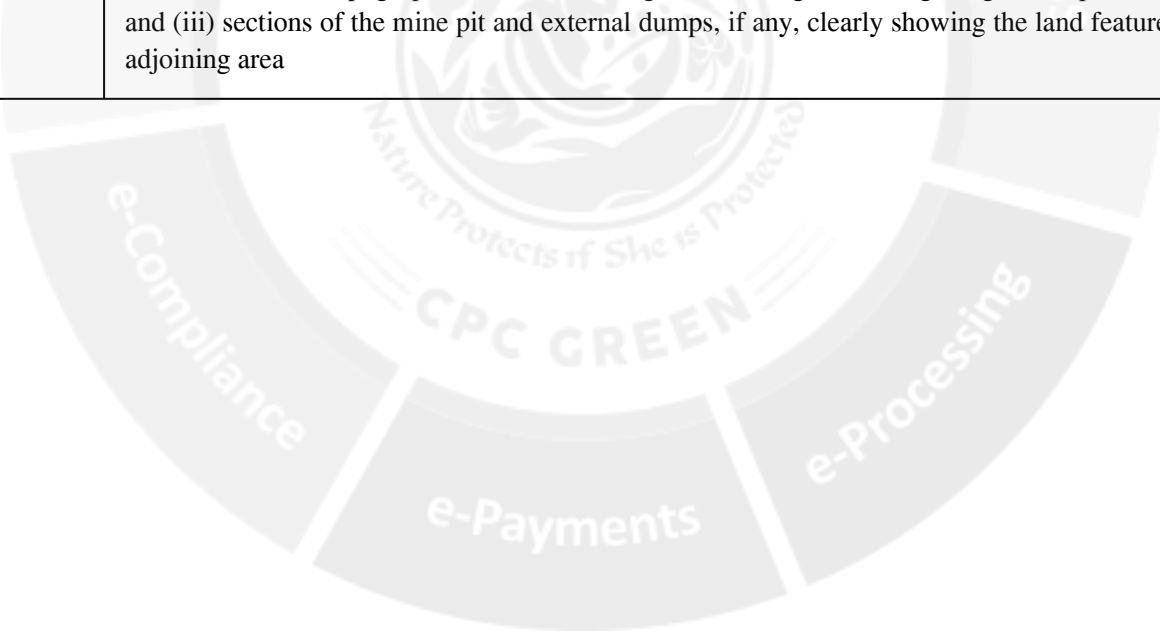
| S. No | Terms of Reference                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
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|       | been any increase in production after the EIA Notification 1994 came into force, w.r.t. the highest production achieved prior to 1994                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| 1.2   | A copy of the document in support of the fact that the Proponent is the rightful lessee of the mine should be given                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| 1.3   | All documents including approved mine plan, EIA and Public Hearing should be compatible with one another in terms of the mine lease area, production levels, waste generation and its management, mining technology etc. and should be in the name of the lessee                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| 1.4   | All corner coordinates of the mine lease area, superimposed on a High Resolution Imagery/toposheet, topographic sheet, geomorphology and geology of the area should be provided. Such an Imagery of the proposed area should clearly show the land use and other ecological features of the study area (core and buffer zone)                                                                                                                                                                                                                                                                                                                                                                                                                          |
| 1.5   | 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                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| 1.6   | 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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| 1.7   | It should be clearly stated whether the proponent Company has a well laid down Environment Policy approved by its Board of Directors? If so, it may be spelt out in the EIA Report with description of the prescribed operating process/procedures to bring into focus any infringement/deviation/ violation of the environmental or forest norms/ conditions? The hierarchical system or administrative order of the Company to deal with the environmental issues and for ensuring compliance with the EC conditions may also be given. The system of reporting of non-compliances / violations of environmental norms to the Board of Directors of the Company and/or shareholders or stakeholders at large, may also be detailed in the EIA Report |
| 1.8   | Issues relating to Mine Safety, including subsidence study in case of underground mining and slope study in case of open cast mining, blasting study etc. should be detailed. The proposed safeguard measures in each case should also be provided                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| 1.9   | 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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| 1.10  | 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                                                                                                                                                                                                                                                                                                                |
| 1.11  | 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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| 1.12  | A Certificate from the Competent Authority in the State Forest Department should be provided, confirming the involvement of forest land, if any, in the project area. In the event of any contrary                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |

| S. No | Terms of Reference                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
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|       | 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 State Expert Appraisal Committees                                                                                                                                                                                                                                                                                                |
| 1.13  | 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                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| 1.14  | 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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| 1.15  | The vegetation in the RF / PF areas in the study area, with necessary details, should be given                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| 1.16  | 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                                                                                                                                                                                                                                                                                                                                                                                               |
| 1.17  | 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                                                                                                                                                                                             |
| 1.18  | 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 alongwith 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 |
| 1.19  | 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 Dept. Should be secured and furnished to the effect that the proposed mining activities could be considered                                                                                                                                                                                                                                                                                                      |
| 1.20  | 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)                                                                                                                                                                                                                                                                                                                                                         |
| 1.21  | 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                                                                                                                                                                                                                                                                                                                                                                                                                               |

| S. No | Terms of Reference                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
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|       | 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                                                                                                                                                                                                                                                                                                                                                                                 |
| 1.22  | 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 |
| 1.23  | 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                                                                                                                                                                                                                                                                                            |
| 1.24  | 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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| 1.25  | Necessary clearance from the Competent Authority for drawl of requisite quantity of water for the Project should be provided                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| 1.26  | 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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| 1.27  | 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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| 1.28  | 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 State Ground Water Authority for working below ground water and for pumping of ground water should also be obtained and copy furnished                                                                                                                                                                                                                                                                |
| 1.29  | 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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| 1.30  | 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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| 1.31  | A time bound Progressive Greenbelt Development Plan shall be prepared in a tabular form                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |

| S. No | Terms of Reference                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
|-------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|       | (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 |
| 1.32  | 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                                                                                 |
| 1.33  | Details of the onsite shelter and facilities to be provided to the mine workers should be included in the EIA Report                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| 1.34  | 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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| 1.35  | 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                                                                                                                                                                                                                                                                        |
| 1.36  | 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                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| 1.37  | 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                                                                                                                                                                                                                                                                                                                                                                                                                  |
| 1.38  | 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                                                                                                                                                                                                                                                                                                                                                                         |
| 1.39  | 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                                                                                                                                                                                                                                                                                                                                                                                                           |
| 1.40  | Details of litigation pending against the project, if any, with direction /order passed by any Court of Law against the Project should be given                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| 1.41  | The cost of the Project (capital cost and recurring cost) as well as the cost towards implementation of EMP should be clearly spelt out                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| 1.42  | A Disaster management Plan shall be prepared and included in the EIA/EMP Report                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |

| S. No | Terms of Reference                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
|-------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1.43  | 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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| 1.44  | <p>Besides the above, the below mentioned general points are also to be followed:- a) All documents to be properly referenced with index and continuous page numbering. b) Where data are presented in the Report especially in Tables, the period in which the data were collected and the sources should be indicated. c) Project Proponent shall enclose all the analysis/testing reports of water, air, soil, noise etc. using the MoEF&amp;CC/NABL accredited laboratories. All the original analysis/testing reports should be available during appraisal of the Project. d) Where the documents provided are in a language other than English, an English translation should be provided. e) The Questionnaire for environmental appraisal of mining projects as devised earlier by the Ministry shall also be filled and submitted. f) While preparing the EIA report, the instructions for the Proponents and instructions for the Consultants issued by MoEF 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. g) 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&amp;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. h) 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. i) 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</p> |



## **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 Report.
- 8) Issues relating to Mine Safety, including subsidence study in case of underground mining and slope study in case of open cast mining, blasting study etc. should be detailed. The

proposed safeguard measures in each case should also be provided.

- 9) The study area will comprise of 10 km zone around the mine lease from lease periphery and the data contained in the EIA such as waste generation etc. should be for the life of the mine / lease period.
- 10) Land use of the study area delineating forest area, agricultural land, grazing land, wildlife sanctuary, national park, migratory routes of fauna, water bodies, human settlements and other ecological features should be indicated. Land use plan of the mine lease area should be prepared to encompass preoperational, operational and post operational phases and submitted. Impact, if any, of change of land use should be given.
- 11) Details of the land for any Over Burden Dumps outside the mine lease, such as extent of land area, distance from mine lease, its land use, R&R issues, if any, should be given.
- 12) Certificate from the Competent Authority in the State Forest Department should be provided, confirming the involvement of forest land, if any, in the project area. In the event of any contrary claim by the Project Proponent regarding the status of forests, the site may be inspected by the State Forest Department along with the Regional Office of the Ministry to ascertain the status of forests, based on which, the Certificate in this regard as mentioned above be issued. In all such cases, it would be desirable for representative of the State Forest Department to assist the Expert Appraisal Committees.
- 13) Status of forestry clearance for the broken up area and virgin forestland involved in the Project including deposition of Net Present Value (NPV) and Compensatory Afforestation (CA) should be indicated. A copy of the forestry clearance should also be furnished.
- 14) Implementation status of recognition of forest rights under the Scheduled Tribes and other Traditional Forest Dwellers (Recognition of Forest Rights) Act, 2006 should be indicated.
- 15) The vegetation in the RF / PF areas in the study area, with necessary details, should be given.
- 16) A study shall be got done to ascertain the impact of the Mining Project on wildlife of the study area and details furnished. Impact of the project on the wildlife in the surrounding and any other protected area and accordingly, detailed mitigative measures required, should be worked out with cost implications and submitted.
- 17) Location of National Parks, Sanctuaries, Biosphere Reserves, Wildlife Corridors, Ramsar site Tiger/ Elephant Reserves/(existing as well as proposed), if any, within 10 km of the mine lease should be clearly indicated, supported by a location map duly authenticated by Chief Wildlife Warden. Necessary clearance, as may be applicable to such projects due to proximity of the ecologically sensitive areas as mentioned above, should be obtained from



the Standing Committee of National Board of Wildlife and copy furnished.

- 18) A detailed biological study of the study area [core zone and buffer zone (10 km radius of the periphery of the mine lease)] shall be carried out. Details of flora and fauna, endangered, endemic and RET Species duly authenticated, separately for core and buffer zone should be furnished based on such primary field survey, clearly indicating the Schedule of the fauna present. In case of any scheduled-I fauna found in the study area, the necessary plan along with budgetary provisions for their conservation should be prepared in consultation with State Forest and Wildlife Department and details furnished. Necessary allocation of funds for implementing the same should be made as part of the project cost.
- 19) Proximity to Areas declared as 'Critically Polluted' or the Project areas likely to come under the 'Aravali Range', (attracting court restrictions for mining operations), should also be indicated and where so required, clearance certifications from the prescribed Authorities, such as the SPCB or State Mining Department should be secured and furnished to the effect that the proposed mining activities could be considered.
- 20) Similarly, for Coastal Projects, a CRZ map duly authenticated by one of the authorized agencies demarcating LTL, HTL, CRZ area, location of the mine lease with respect to CRZ, coastal features such as mangroves, if any, should be furnished. (Note: The Mining Projects falling under CRZ would also need to obtain approval of the concerned Coastal Zone Management Authority).
- 21) R&R Plan/compensation details for the Project Affected People (PAP) should be furnished. While preparing the R&R Plan, the relevant State/National Rehabilitation & Resettlement Policy should be kept in view. In respect of SCs /STs and other weaker sections of the society in the study area, a need based sample survey, family-wise, should be undertaken to assess their requirements, and action programmes prepared and submitted accordingly, integrating the sectoral programmes of line departments of the State Government. It may be clearly brought out whether the village(s) located in the mine lease area will be shifted or not. The issues relating to shifting of village(s) including their R&R and socio-economic aspects should be discussed in the Report.
- 22) One season (non-monsoon) [i.e. March-May (Summer Season); October-December (post monsoon season); December-February (winter season)] primary baseline data on ambient air quality as per CPCB Notification of 2009, water quality, noise level, soil and flora and fauna shall be collected and the AAQ and other data so compiled presented date-wise in the EIA and EMP Report. Site-specific meteorological data should also be collected. The

location of the monitoring stations should be such as to represent whole of the study area and justified keeping in view the pre-dominant downwind direction and location of sensitive receptors. There should be at least one monitoring station within 500 m of the mine lease in the pre-dominant downwind direction. The mineralogical composition of PM10, particularly for free silica, should be given.

- 23) Air quality modeling should be carried out for prediction of impact of the project on the air quality of the area. It should also take into account the impact of movement of Vehicles for transportation of mineral. The details of the model used and input parameters used for modeling should be provided. The air quality contours may be shown on a location map clearly indicating the location of the site, location of sensitive receptors, if any, and the habitation. The wind roses showing pre-dominant wind direction may also be indicated on the map.
- 24) The water requirement for the Project, its availability and source should be furnished. A detailed water balance should also be provided. Fresh water requirement for the Project should be indicated.
- 25) Necessary clearance from the Competent Authority for drawl of requisite quantity of water for the Project should be provided.
- 26) Description of water conservation measures proposed to be adopted in the Project should be given. Details of rainwater harvesting proposed in the Project, if any, should be provided.
- 27) Impact of the Project on the water quality, both surface and groundwater, should be assessed and necessary safeguard measures, if any required, should be provided.
- 28) Based on actual monitored data, it may clearly be shown whether working will intersect groundwater. Necessary data and documentation in this regard may be provided. In case the working will intersect groundwater table, a detailed Hydro Geological Study should be undertaken and Report furnished. The Report inter-alia, shall include details of the aquifers present and impact of mining activities on these aquifers. Necessary permission from Central Ground Water Authority for working below ground water and for pumping of ground water should also be obtained and copy furnished.
- 29) Details of any stream, seasonal or otherwise, passing through the lease area and modification / diversion proposed, if any, and the impact of the same on the hydrology should be brought out.
- 30) Information on site elevation, working depth, groundwater table etc. Should be provided both in AMSL and bgl. A schematic diagram may also be provided for the same.

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

proposed Project.

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

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

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

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

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

increase in the above study shall be substantiated with mitigation measures.

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. 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.

From  
Dr.S.Vediappan, M.Sc., Ph.D.,  
Deputy Director,  
Geology and Mining,  
Tiruvannamalai - 4.

To  
Sri Kanniyammal Blue Metals,  
Proprietor Thiru.Kumar,  
S/o. Kannaiyan,  
No. 660/2A, 2B, 2C, 2D, 660/1A, 1B,  
Arapakkam Village,  
Walajabad Taluk,  
Kanchipuram District.

**Rc.No.172/Kanimam/2025, dated 06.06.2025.**

Sir,

**Sub:** Quarries and Minerals - Minor Mineral - Rough stone and Gravel - Tiruvannamalai District - Vembakkam Taluk -patta land Kundiyanthandalam Village SF.Nos.162/1, 162/2A, 162/2B etc., and Poonathangal Village SF.Nos. 117/12A2, 144/1A & 144/2 over an extent of 3.38.58 hecsts., - Application preferred by **Sri Kanniyammal Blue Metals**, Thiru.Kumar- Precise area communicated - Submitted of three copies of draft Mining Plan for approval - Approval accorded - regarding.

- Ref:** 1. Application from Sri Kanniyammal Blue Metals, Thiru.Kumardated 05.03.2025.  
2. Precise Area Communication Notice Rc.No.172/Kanimam/2025, dated 04.04.2025.  
3. Mining Plan submitted by Sri Kanniyammal Blue Metals, Thiru.Kumardated 08.05.2025.

\*\*\*\*

Sri Kanniyammal Blue Metals, Proprietor Thiru.Kumarhas preferred an application for the grant of Rough Stone and Gravel quarry lease over an extent of 3.38.58 hecsts., of Patta land in SF.Nos.162/1, 162/2A, 162/2B, 162/6, 162/3, 162/4, 162/5A, 162/5B, 162/7, 162/8, 162/10A1, 162/10A3A, 162/10A3B & 162/10A2 of KundiyandhandalamVillage and S.F.Nos. 117/12A2, 144/1A & 144/2 of Poonathangal Village, VembakkamTaluk, Tiruvannamalai District for a period of 5 (Five years)vide the reference 1<sup>st</sup> cited and the precise area has been communicated to the applicant vide the reference 2<sup>nd</sup>cited with a direction to submit the approved mining plan and Environmental Clearance for grant of quarrying lease.



2. As directed, the applicant has submitted three copies of draft mining plan for approval vide the reference 3<sup>rd</sup> cited. The draft Mining Plan has been verified in detail and found that it has been prepared in accordance with the guidelines / instructions issued by the Commissioner of Geology and Mining in letter RC. No. 3868 / LC / 2012 dated 19.11.2012.

3. The draft mining plan is prepared with Common boundary between the applied area and SF.Nos.162/10B and 162/9 of the existing lease granted to Thiru.Moorthyvide proceedings of Deputy Director of Geology and Mining Rc.No.627/Kanimam/2021, dated 08.02.2023 over an extent 3.68.0 hectares inKundiyanthandalamand Poonathangal Villages of Vembakkam Taluk, Tiruvannamalai District

i) The reserves estimated in the mining plan is

| Depth in Mts.                | Geological Resources |         |         | Mineable Reserves |        |         |
|------------------------------|----------------------|---------|---------|-------------------|--------|---------|
|                              | Mineral              | in Cbm  | in Tons | Mineral           | in Cbm | in Tons |
| 50m<br>Below Ground<br>Level | Rough<br>Stone       | 1523250 | 4188938 | Rough Stone       | 381425 | 1048919 |
|                              | Gravel               | 169250  | 338500  | Gravel            | 89610  | 179220  |

4. Therefore in exercise of the powers conferred under Rule 41(2) of Tamil Nadu Minor Mineral Concession Rules, 1959, the mining plan is hereby approved, subject to the following conditions:-

- 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.
- This approval of the mining plan does not in any way convey the approval of the Government in terms or any other provisions of the Mines and Minerals (Development and Regulation) Act, 1957, or any other connected laws including Forest (Conservation) Act, 1980, Forest Conservation Rules, 1981, Environment Protection Act, 1980, Explosives Act, 1884 (Central Act IV of 1884) Minor Mineral Concession and

Development Rules, 2010 and the Rules made there under and the Tamil Nadu Minor Mineral Concession Rules, 1959.

- iii. The mining plan is approved without prejudice to any other order or direction from any court of competent jurisdiction.
- iv. The validity of the mining plan is co-terminus with the lease period.
- v. Quarrying shall be done in accordance with the approved Mining Plan.
- vi. If anything is found to be concealed in the contents of the mining plan which are required by the mines act or if any proposed for rectification has not been made, the approval shall be deemed to have been withdrawn with immediate effect.
- vii. All the conditions stipulated in the precise area communication dated 04.04.2025 should be duly complied with.
- viii. The approval of this mining plan having common boundary with SF.Nos. 162/10B and 162/9 is subject to approval by the concerned authority under Regulation 111 of the Metalliferous Mines Regulation, 1961.

**4. Further, other quarries situated within 500m radial distance are as follows.**

**i) Existing Quarries**

| Name of the Owner        | Village & S.F. Nos.                                                                                                          | Extent in Hects. | Lease Period                | Remarks                    |
|--------------------------|------------------------------------------------------------------------------------------------------------------------------|------------------|-----------------------------|----------------------------|
| K.Chandrasekaran         | Kundiyanthandalam<br>163/1A, 1B, 2, 3, 4,<br>7, 8A, 9, 10A, 10B,<br>11                                                       | 1.97.5           | 02.12.2021 to<br>01.12.2031 | Rough<br>Stone<br>Quarries |
| Sri Thiumala Blue Metals | Menallur<br>47/1A,1B,1C2, &<br>etc.,                                                                                         | 2.98.5           | 07.05.2021 to<br>06.05.2031 |                            |
| Willian                  | Kundiyanthandalam<br>159, 160, 164/2 Part                                                                                    | 2.88.0           | 24.12.2021 to<br>23.12.2026 |                            |
| Bhuvaneshwari            | Kundiyanthandalam<br>181/1I1, 1I2, 1J1,<br>1J2, 1L1, 1L2, 1M1,<br>1M2, 1N1, 1N2, 1O1,<br>1O2, 1O3, 1O4, 1P,<br>1Q1, 1Q2, 1Q3 | 2.05.5           | 23.02.2022 to<br>22.02.2032 |                            |

|                                        |                                                                                                                                                                    |         |                             |
|----------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------|-----------------------------|
| Dasaradhan                             | Kundiyanthandalam<br>186/1, 190/2B1,<br>2B2                                                                                                                        | 2.88.5  | 15.07.2022 to<br>14.02.2032 |
| K.Moorthy                              | Kundiyanthandalam<br>& Poonathangal<br>162/9, 10B, 163/5,<br>6, 10C, 12, 13A,<br>13B, 13C, 13D,<br>13E, 13F, 14A,<br>181/1D1, 1D2, 1E1,<br>1E2, 1E3, 117/14,<br>15 | 3.68.0  | 08.02.2023 to<br>07.02.2033 |
| Lakshmi Narayana                       | Menallur &<br>Poonathangal<br>152/6, 4B, 5B,<br>151/3, 121/2, etc.,                                                                                                | 7.21.4  | 15.05.2023 to<br>14.02.2033 |
| Sri Thirumala<br>Blue Metals II        | Menallur<br>146/39B, 146/46<br>etc.,                                                                                                                               | 4.44.35 | 17.2.2025 to<br>16.02.2030  |
| Aditya Dura<br>Aggregates Pvt.<br>Ltd. | Poonathangal<br>124/30, 124/31 etc.,                                                                                                                               | 4.87.88 | 12.02.2025 to<br>11.02.2035 |

**ii) Abandoned quarries**

| Name of the Owner | Village & S.F. Nos.                                                                  | Extent in Hects. | Lease Period                | Remarks          |
|-------------------|--------------------------------------------------------------------------------------|------------------|-----------------------------|------------------|
| P.Balaji,         | Kundiyanthandalam<br>181/2A & 181/2B                                                 | 0.80.5           | 04.01.2010 to<br>03.01.2015 | Expired Quarries |
| A.William         | Kundiyanthandalam<br>164/1                                                           | 1.21.5           | 20.06.2013 to<br>19.06.2018 |                  |
| T.Bharath,        | Kundiyanthandalam<br>179/1, 2, 3                                                     | 1.00.5           | 23.08.2013 to<br>22.08.2018 |                  |
| B.Sri Devi,       | Kundiyanthandalam<br>1181/2A, 181/2B &<br>etc.,                                      | 1.15.5           | 28.07.2016 to<br>27.07.2021 |                  |
| K.Kumar,          | Kundiyanthandalam<br>163/14B, 163/14C<br>& etc.,                                     | 2.29.5           | 28.07.2016 to<br>27.07.2021 |                  |
| E.Panneerselvam   | Kundiyanthandalam<br>187/3                                                           | 1.43.0           | 14.09.2017 to<br>13.09.2022 |                  |
| A.Aron Samuvel,   | Kundiyanthandalam<br>176/6A, 6B, 7A, 7B,<br>7C, 9A, 9B                               | 1.83.5           | 17.09.2018 to<br>16.09.2023 |                  |
| M.Sudharsan,      | Kundiyanthandalam<br>178/, 1B2, 1C1,<br>1C2, 1D1, 1D2, 1D4,<br>181/1C1, 1C2 &<br>1G1 | 3.25.0           | 17.09.2018 to<br>16.09.2023 |                  |

K. Kan.



|                            |                                                  |        |                             |
|----------------------------|--------------------------------------------------|--------|-----------------------------|
| R.Venkatasubram<br>aniyan, | Kundiyanthandalam<br>168/2A<br>168/2B2<br>168/2C | 2.43.0 | 04.12.2018 to<br>03.12.2023 |
| P. Prabakaran,             | Kundiyanthandalam<br>164/2                       | 3.48.5 | 19.02.2008 to<br>18.02.2013 |

iii) **Present Proposed Quarries**

| Sl.<br>No | Name of the Owner                                                                                                                                                                       | Village &<br>S.F. Nos.                                                    | Extent<br>in Hects. |
|-----------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------|---------------------|
| 1         | Sri Kanniyammal Blue Metals,<br>Proprietor Thiru.Kumar,<br>S/o. Kannaiyan,<br>No. 660/2A, 2B, 2C, 2D,<br>660/1A, 1B,<br>Arapakkam Village,<br>Walajabad Taluk,<br>Kanchipuram District. | Ilangadu<br>218/1A, 218/2B, 218/3B,<br>218/4A, 218/5B, 219/1A &<br>219/2B | 4.99.06             |
| 2         | M/s. A.P.Mines.<br>Tr.G.Pradeep Krishnan,<br>No.48, Hormony Vilas,<br>Sri Sai Nagar extension,<br>Srinivasapuram,<br>Ayyappanthangal, Chennai.                                          | Karanai<br>175/1, 175/2, etc.,                                            | 5.57.0              |

**Encl:** 2 Copies of Approved Mining Plan. (64)

*S. 02.1. 06.06.25*  
Deputy Director,  
Geology and Mining,  
Tiruvannamalai.

**Copy submitted to:**

1. The Chairman, SEIAA,  
Tamil Nadu, 3<sup>rd</sup> Floor, Panagal Maaligai,  
No.1, Jeenis Road, Saidapet, Chennai-15.
2. The Commissioner of Geology and Mining, Chennai-32.
3. The District Collector, Tiruvannamalai.

From  
Dr.S.Vediappan, M.Sc., Ph.D.,  
Deputy Director,  
Geology and Mining,  
Tiruvannamalai - 4.

To  
Sri Kanniyammal Blue Metals,  
Proprietor Thiru.Kumar,  
S/o. Kannaiyan,  
No. 660/2A, 2B, 2C, 2D, 660/1A, 1B,  
Arapakkam Village,  
Walajabad Taluk,  
Kanchipuram District.

**Rc.No.172/Kanimam/2025, dated 06.06.2025.**

Sir,

**Sub:** Quarries and Minerals - Minor Mineral - Rough stone and Gravel - Tiruvannamalai District - Vembakkam Taluk -patta land Kundiyanthandalam Village SF.Nos.162/1, 162/2A, 162/2B etc., and Poonathangal Village SF.Nos. 117/12A2, 144/1A & 144/2 over an extent of 3.38.58 hecets., - Application preferred by **Sri Kanniyammal Blue Metals**, Thiru.Kumar- Precise area communicated - Submitted of three copies of draft Mining Plan for approval - Approval accorded - regarding.

- Ref:** 1. Application from Sri Kanniyammal Blue Metals, Thiru.Kumardated 05.03.2025.  
2. Precise Area Communication Notice Rc.No.172/Kanimam/2025, dated 04.04.2025.  
3. Mining Plan submitted by Sri Kanniyammal Blue Metals, Thiru.Kumardated 08.05.2025.

\*\*\*\*

Sri Kanniyammal Blue Metals, Proprietor Thiru.Kumarhas preferred an application for the grant of Rough Stone and Gravel quarry lease over an extent of 3.38.58 hecets., of Patta land in SF.Nos.162/1, 162/2A, 162/2B, 162/6, 162/3, 162/4, 162/5A, 162/5B, 162/7, 162/8, 162/10A1, 162/10A3A, 162/10A3B & 162/10A2 of KundiyandhandalamVillage and S.F.Nos. 117/12A2, 144/1A & 144/2 of Poonathangal Village, VembakkamTaluk, Tiruvannamalai District for a period of 5 (Five years)vide the reference 1<sup>st</sup> cited and the precise area has been communicated to the applicant vide the reference 2<sup>nd</sup>cited with a direction to submit the approved mining plan and Environmental Clearance for grant of quarrying lease.

2. As directed, the applicant has submitted three copies of draft mining plan for approval vide the reference 3<sup>rd</sup> cited. The draft Mining Plan has been verified in detail and found that it has been prepared in accordance with the guidelines / instructions issued by the Commissioner of Geology and Mining in letter RC. No. 3868 / LC / 2012 dated 19.11.2012.

3. The draft mining plan is prepared with Common boundary between the applied area and SF.Nos.162/10B and 162/9 of the existing lease granted to Thiru.Moorthyvide proceedings of Deputy Director of Geology and Mining Rc.No.627/Kanimam/2021, dated 08.02.2023 over an extent 3.68.0 hectares inKundiyanthandalamand Poonaithangal Villages of Vembakkam Taluk, Tiruvannamalai District

i) The reserves estimated in the mining plan is

| Depth in Mts.                | Geological Resources |         |         | Mineable Reserves |        |         |
|------------------------------|----------------------|---------|---------|-------------------|--------|---------|
|                              | Mineral              | in Cbm  | in Tons | Mineral           | in Cbm | in Tons |
| 50m<br>Below Ground<br>Level | Rough<br>Stone       | 1523250 | 4188938 | Rough Stone       | 381425 | 1048919 |
|                              | Gravel               | 169250  | 338500  | Gravel            | 89610  | 179220  |

4. Therefore in exercise of the powers conferred under Rule 41(2) of Tamil Nadu Minor Mineral Concession Rules, 1959, the mining plan is hereby approved, subject to the following conditions:-

- 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.
- This approval of the mining plan does not in any way convey the approval of the Government in terms or any other provisions of the Mines and Minerals (Development and Regulation) Act, 1957, or any other connected laws including Forest (Conservation) Act, 1980, Forest Conservation Rules, 1981, Environment Protection Act, 1980, Explosives Act, 1884 (Central Act IV of 1884) Minor Mineral Concession and



Development Rules, 2010 and the Rules made there under and the Tamil Nadu Minor Mineral Concession Rules, 1959.

- iii. The mining plan is approved without prejudice to any other order or direction from any court of competent jurisdiction.
- iv. The validity of the mining plan is co-terminus with the lease period.
- v. Quarrying shall be done in accordance with the approved Mining Plan.
- vi. If anything is found to be concealed in the contents of the mining plan which are required by the mines act or if any proposed for rectification has not been made, the approval shall be deemed to have been withdrawn with immediate effect.
- vii. All the conditions stipulated in the precise area communication dated 04.04.2025 should be duly complied with.
- viii. The approval of this mining plan having common boundary with SF.Nos. 162/10B and 162/9 is subject to approval by the concerned authority under Regulation 111 of the Metalliferous Mines Regulation, 1961.

**4. Further, other quarries situated within 500m radial distance are as follows.**

**i) Existing Quarries**

| Name of the Owner        | Village & S.F. Nos.                                                                                                          | Extent in Hects. | Lease Period                | Remarks                    |
|--------------------------|------------------------------------------------------------------------------------------------------------------------------|------------------|-----------------------------|----------------------------|
| K.Chandrasekaran         | Kundiyanthandalam<br>163/1A, 1B, 2, 3, 4,<br>7, 8A, 9, 10A, 10B,<br>11                                                       | 1.97.5           | 02.12.2021 to<br>01.12.2031 | Rough<br>Stone<br>Quarries |
| Sri Thiumala Blue Metals | Menallur<br>47/1A,1B,1C2, &<br>etc.,                                                                                         | 2.98.5           | 07.05.2021 to<br>06.05.2031 |                            |
| Willian                  | Kundiyanthandalam<br>159, 160, 164/2 Part                                                                                    | 2.88.0           | 24.12.2021 to<br>23.12.2026 |                            |
| Bhuvaneshwari            | Kundiyanthandalam<br>181/1I1, 1I2, 1J1,<br>1J2, 1L1, 1L2, 1M1,<br>1M2, 1N1, 1N2, 1O1,<br>1O2, 1O3, 1O4, 1P,<br>1Q1, 1Q2, 1Q3 | 2.05.5           | 23.02.2022 to<br>22.02.2032 |                            |

*K. Mani*

|                                        |                                                                                                                                                                     |         |                             |
|----------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------|-----------------------------|
| Dasaradhan                             | Kundiyanthandalam<br>186/1, 190/2B1,<br>2B2                                                                                                                         | 2.88.5  | 15.07.2022 to<br>14.02.2032 |
| K.Moorthy                              | Kundiyanthandalam<br>& Poonathangal<br>162/9, 10B, 163/5,<br>6, 10C, 12, 13A,<br>13B, 13C,m 13D,<br>13E, 13F, 14A,<br>181/1D1, 1D2, 1E1,<br>1E2, 1E3, 117/14,<br>15 | 3.68.0  | 08.02.2023 to<br>07.02.2033 |
| Lakshmi Narayana                       | Menallur &<br>Poonathangal<br>152/6, 4B, 5B,<br>151/3, 121/2, etc.,                                                                                                 | 7.21.4  | 15.05.2023 to<br>14.02.2033 |
| Sri Thirumala<br>Blue Metals II        | Menallur<br>146/39B, 146/46<br>etc.,                                                                                                                                | 4.44.35 | 17.2.2025 to<br>16.02.2030  |
| Aditya Dura<br>Aggregates Pvt.<br>Ltd. | Poonathangal<br>124/30, 124/31 etc.,                                                                                                                                | 4.87.88 | 12.02.2025 to<br>11.02.2035 |

**ii) Abandoned quarries**

| Name of the Owner | Village & S.F. Nos.                                                                  | Extent in Hects. | Lease Period                | Remarks          |
|-------------------|--------------------------------------------------------------------------------------|------------------|-----------------------------|------------------|
| P.Balaji,         | Kundiyanthandalam<br>181/2A & 181/2B                                                 | 0.80.5           | 04.01.2010 to<br>03.01.2015 | Expired Quarries |
| A.William         | Kundiyanthandalam<br>164/1                                                           | 1.21.5           | 20.06.2013 to<br>19.06.2018 |                  |
| T.Bharath,        | Kundiyanthandalam<br>179/1, 2, 3                                                     | 1.00.5           | 23.08.2013 to<br>22.08.2018 |                  |
| B.Sri Devi,       | Kundiyanthandalam<br>1181/2A, 181/2B &<br>etc.,                                      | 1.15.5           | 28.07.2016 to<br>27.07.2021 |                  |
| K.Kumar,          | Kundiyanthandalam<br>163/14B , 163/14C<br>& etc.,                                    | 2.29.5           | 28.07.2016 to<br>27.07.2021 |                  |
| E.Panneerselvam   | Kundiyanthandalam<br>187/3                                                           | 1.43.0           | 14.09.2017 to<br>13.09.2022 |                  |
| A.Aron Samuvel,   | Kundiyanthandalam<br>176/6A, 6B, 7A, 7B,<br>7C, 9A, 9B                               | 1.83.5           | 17.09.2018 to<br>16.09.2023 |                  |
| M.Sudharsan,      | Kundiyanthandalam<br>178/, 1B2, 1C1,<br>1C2, 1D1, 1D2, 1D4,<br>181/1C1, 1C2 &<br>1G1 | 3.25.0           | 17.09.2018 to<br>16.09.2023 |                  |

K. Kon.



|                            |                                                  |        |                             |  |
|----------------------------|--------------------------------------------------|--------|-----------------------------|--|
| R.Venkatasubram<br>aniyan, | Kundiyanthandalam<br>168/2A<br>168/2B2<br>168/2C | 2.43.0 | 04.12.2018 to<br>03.12.2023 |  |
| P. Prabakaran,             | Kundiyanthandalam<br>164/2                       | 3.48.5 | 19.02.2008 to<br>18.02.2013 |  |

iii) **Present Proposed Quarries**

| Sl.<br>No | Name of the Owner                                                                                                                                                                       | Village &<br>S.F. Nos.                                                    | Extent<br>in Hects. |
|-----------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------|---------------------|
| 1         | Sri Kanniyammal Blue Metals,<br>Proprietor Thiru.Kumar,<br>S/o. Kannaiyan,<br>No. 660/2A, 2B, 2C, 2D,<br>660/1A, 1B,<br>Arapakkam Village,<br>Walajabad Taluk,<br>Kanchipuram District. | Ilangadu<br>218/1A, 218/2B, 218/3B,<br>218/4A, 218/5B, 219/1A &<br>219/2B | 4.99.06             |
| 2         | M/s. A.P.Mines.<br>Tr.G.Pradeep Krishnan,<br>No.48, Hormony Vilas,<br>Sri Sai Nagar extension,<br>Srinivasapuram,<br>Ayyappanthangal, Chennai.                                          | Karanai<br>175/1, 175/2, etc.,                                            | 5.57.0              |

**Encl:** 2 Copies of Approved Mining Plan. (64)

37. 02.11. 06.06.25  
Deputy Director,  
Geology and Mining,  
Tiruvannamalai.

**Copy submitted to:**

1. The Chairman, SEIAA,  
Tamil Nadu, 3<sup>rd</sup> Floor, Panagal Maaligai,  
No.1, Jeenis Road, Saidapet, Chennai-15.
2. The Commissioner of Geology and Mining, Chennai-32.
3. The District Collector, Tiruvannamalai.

# MINING PLAN

FOR

KUNDIYATHANDALAM & POONAITHANGAL VILLAGE ROUGH STONE AND  
GRAVEL MINING LEASE WITH PROGRESSIVE QUARRY CLOSURE PLAN

Patta land /Open Cast-Semi-Mechanized mining/Non- Forest/Non-Captive Use

Lease period 5 Years from the date of lease execution

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

## LOCATION OF THE LEASE AREA

STATE : TAMILNADU  
DISTRICT : TIRUVANNAMALAI  
TALUK : VEMBAKKAM  
VILLAGE : KUNDIYATHANDALAM &  
POONAITHANGAL  
S.F. No's : 162/1, 162/2A, 162/2B, 162/3,  
162/4, 162/5A, 162/5B, 162/6,  
162/7, 162/8, 162/10A1,  
162/10A2, 162/10A3A,  
162/10A3B and 117/12A2,  
144/1A, 144/2

EXTENT : 3.38.58Hectares

## ADDRESS OF THE APPLICANT

**M/s.Sri Kanniammal Blue Metals,**  
Proprietor, Mr.K.Kumar  
S/o.Kannaiyan,  
S.No.660/2A, 2B, 2C, 2D, 660/1A, 1B,  
Aarpakkam Village, Walajabad Taluk,  
Kancheepuram District.

## PREPARED BY

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

Qualified Person



**GEO TECHNICAL MINING SOLUTIONS**  
(ANABET accredited & ISO certified Company)

No: 1/213-B, Natesan Complex,

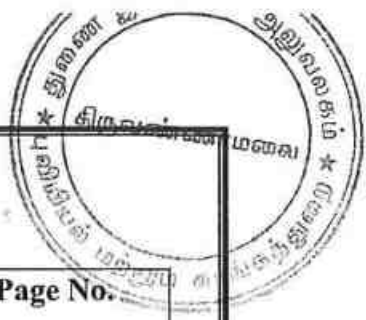
Oddapatti, Collectorate Post office, Dharmapuri -636705

Ph: +91 9443937841, 7010076633

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

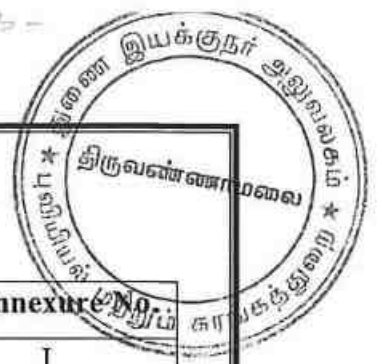
Website: www.gtmsind.com





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### ANNEXURES

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### LIST OF PLATES

| Sl. No. | Description                                 | Plate No. | Scale                                      |
|---------|---------------------------------------------|-----------|--------------------------------------------|
| 1       | Key Map                                     | I         | Not to scale                               |
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| 3       | Toposheet Map                               | I-B       | 1:1,00,000                                 |
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| 11      | Mine Layout Plan and Land Use Pattern       | V         | Plan 1:1000                                |
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**M/s.Sri Kanniammal Blue Metals,**  
Proprietor, Mr.K.Kumar  
S/o.Kannaiyan,  
S.No.660/2A, 2B, 2C, 2D, 660/1A, 1B,  
Aarpakkam Village, Walajabad Taluk,  
Kancheepuram District.

**CONSENT LETTER FROM THE APPLICANT**

The Mining Plan in respect of rough stone and gravel quarry lease in patta land at S.F.No's: 162/1, 162/2A, 162/2B, 162/3, 162/4, 162/5A, 162/5B, 162/6, 162/7, 162/8, 162/10A1, 162/10A2, 162/10A3A, 162/10A3B and 117/12A2, 144/1A, 144/2 over an extent of 3.38.58hectares of Kundiyathandalam & Poonaitangal, Vembakkam Taluk, Tiruvannamalai District, Tamil Nadu State has been prepared by

**Dr. S. KARUPPANNAN. M.Sc., Ph.D. (Qualified Person)**

I request "The Deputy Director, Department of Geology and Mining, Tiruvannamalai District to make further correspondence regarding modifications of the Mining Plan with the said Qualified Person on this following address,

**Dr. S. KARUPPANNAN. M.Sc., Ph.D.**  
(Qualified Person)

***GEO TECHNICAL MINING SOLUTIONS***

(A NABET accredited & ISO certified Company)

No: 1/213-B, Natesan Complex,

Oddapatti, Collectorate Post office, Dharmapuri-636705

Ph: +91 9443937841, +91 7010076633

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

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

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

**Place:** Kancheepuram, TN.

**Date:**

  
Signature of the applicant  
(M/s.Sri Kanniammal Blue Metals)



**M/s.Sri Kanniammal Blue Metals,**  
 Proprietor, Mr.K.Kumar  
 S/o.Kannaiyan,  
 S.No.660/2A, 2B, 2C, 2D, 660/1A, 1B,  
 Aarpakkam Village, Walajabad Taluk,  
 Kancheepuram District.

**DECLARATION**

The Mining Plan in respect of rough stone and gravel quarry lease in Patta land at S.F.No's: 162/1, 162/2A, 162/2B, 162/3, 162/4, 162/5A, 162/5B, 162/6, 162/7, 162/8, 162/10A1, 162/10A2, 162/10A3A, 162/10A3B and 117/12A2, 144/1A, 144/2 over an extent of 3.38.58hectares of Kundiyathandalam & Poonathangal Village, Vembakkam Taluk, Tiruvannamalai 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:** Kancheepuram, TN.

**Date:**

*K. Kan -*

Signature of the applicant  
 (M/s.Sri Kanniammal Blue Metals)





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

(Qualified Person)

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

### CERTIFICATE

This is to certify that, the provisions of 19 Tamil Nadu Minor Minerals Concession Rules, 1959 have been observed in the Mining Plan for the grant of rough stone and gravel quarry lease in S.F.No's: 162/1, 162/2A, 162/2B, 162/3, 162/4, 162/5A, 162/5B, 162/6, 162/7, 162/8, 162/10A1, 162/10A2, 162/10A3A, 162/10A3B and 117/12A2, 144/1A, 144/2 over an extent of 3.38.58hectares of Kundiyathandalam & Poonathangal Village, Vembakkam Taluk, Tiruvannamalai District, Tamil Nadu State granted to **M/s.Sri Kanniammal Blue Metals**, Kancheepuram District.

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: 15/4/25

Signature of the Qualified Person

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



-145-

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

(Qualified Person)

**GEO TECHNICAL MINING SOLUTIONS**

(A NABET accredited & ISO certified Company)

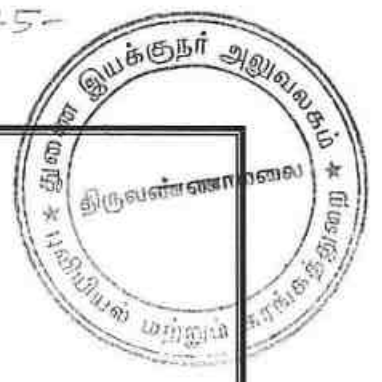
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Website: [www.gtmsind.com](http://www.gtmsind.com)



**CERTIFICATE**

I certify that, in preparation of Mining Plan for rough stone and gravel quarry lease in S.F.No's: 162/1, 162/2A, 162/2B, 162/3, 162/4, 162/5A, 162/5B, 162/6, 162/7, 162/8, 162/10A1, 162/10A2, 162/10A3A, 162/10A3B and 117/12A2, 144/1A, 144/2 over an extent of 3.38.58hectares of Kundiyathandalam & Poonathangal Village, Vembakkam Taluk, Tiruvannamalai District, Tamil Nadu State prepared to **M/s.Sri Kanniammal Blue Metals**, Kancheepuram District, covers all the provisions of Mines Act, Rules, and Regulations etc., made there under and whenever specific permission are required, the applicant will approach the Director General of Mines Safety, Chennai. The standards prescribed by DGMS in respect of Mines Health will be strictly implemented.

Place: Dharmapuri, TN

Date: 15/4/25

Signature of the Qualified Person

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

**GEO TECHNICAL MINING SOLUTIONS**  
A NABET Accredited and ISO Certified Company  
1/213-B, Ground Floor, Natesan Complex,  
Collectorate Post Office, Oddapatti,  
Dharmapuri-636705, TamilNadu, India

# MINING PLAN

FOR KUNDIYATHANDALAM & POONAITHANGAL VILLAGE ROUGH STONE AND  
GRAVEL MINING LEASE WITH PROGRESSIVE QUARRY CLOSURE PLAN

Patta land / Open cast-Semi-Mechanized mining/Non-forest/Non-Captive Use

Lease period 5 Years from the date of lease execution

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

## INTRODUCTORY NOTES:

- a) **Introduction:** The Mining plan with progressive quarry closure plan is prepared for M/s.Sri Kanniammal Blue Metals, Proprietor, Mr.K.Kumar, S/o.Kannaiyan, S.No.660/2A, 2B, 2C, 2D, 660/1A, 1B, Aarpakkam Village, Walajabad Taluk, Kancheepuram District, Tamilnadu State and filed with application for new proposals has submitted to the Deputy Director, Department of Geology and Mining (DDG & M), Tiruvannamalai dated 05.03.2025 had requested to grant the quarry lease for rough stone and gravel in S.F.No's. 162/1, 162/2A, 162/2B, 162/3, 162/4, 162/5A, 162/5B, 162/6, 162/7, 162/8, 162/10A1, 162/10A2, 162/10A3A, 162/10A3B and 117/12A2, 144/1A, 144/2 over an extent of 3.38.58hectares of Kundiyathandalam & Poonathangal Village, Vembakkam Taluk, Tiruvannamalai District, Tamil Nadu State.
- b) **The Precise area communication letter:** The Deputy Director, Department of Geology and mining, Tiruvannamalai has directed to the applicant M/s.Sri Kanniammal Blue Metals through his precise area communication letter vide Roc.No.172/Mines/2025 Dated 04.04.2025, for quarrying lease rough stone and gravel at Tamil Nadu State, Tiruvannamalai District, Vembakkam Taluk, Kundiyathandalam & Poonathangal Village Village in S.F.No's: 162/1, 162/2A, 162/2B, 162/3, 162/4, 162/5A, 162/5B, 162/6, 162/7, 162/8, 162/10A1, 162/10A2, 162/10A3A, 162/10A3B and 117/12A2, 144/1A, 144/2 over an extent of 3.38.58hectares has recommended as following conditions for a period of five (5) years under Rule 19 Tamil Nadu Minor Mineral concession rules, 1959.
- The minerals to be quarried shall be transported by paying seniority amount from time to time as per Schedule II of the Tamil Nadu Minor Mineral Concession Rules, 1959.
  - A safety distance of 50m should be maintained for the Government Eri S.F.No's: 142 and 143 of the village of Poonathangal situated to the north of



S.F.No's: 144/1A, 144/2 and to the west of S.F.No's. 162/1A, 162/2A and 162/3.

- iii. A safety distance of 7.5 m should be maintained for the adjoining Patta lands and 10 m should be maintained for the Government lands.
- iv. The quarrying work shall be carried out by experienced explosive users using low-energy explosives without any disturbance to the adjoining Patta holders/without any encroachment on the adjoining Patta and Government lands.
- v. The approved mining plan as per the rules shall be submitted within the stipulated time.
- vi. A quarry license will be issued only if a no-objection certificate from the Environmental Impact Assessment Authority is obtained and submitted for the area where the quarry license is to be issued.

c) **Preparation and Submission of Mining Plan:** The Mining Plan with progressive quarry closure plan has been prepared under rule 41 and submitted under rule 42 of Tamil Nadu Minor Mineral Concession Rules, 1959 for mining lease as per conditions mentioned in the precise area communication letter **Roc.No.172/Mines/2025 Dated 04.04.2025.**

- *Fresh Quarry lease application was submitted in the name of M/s.Sri Kanniammal Blue Metals, Proprietor, Mr.K.Kumar, in respect of S.F.No's: 162/1, 162/2A, 162/2B, 162/3, 162/4, 162/5A, 162/5B, 162/6, 162/7, 162/8, 162/10A1, 162/10A2, 162/10A3A, 162/10A3B and 117/12A2, 144/1A, 144/2 over an extent of 3.38.58 Hectares of Kundiyathandalam & Poonathangal Village, Vembakkam Taluk, Tiruvannamalai District, Tamil Nadu adjoining to the existing lease held area in patta land at S.F.No's: 162/9, 162/10B, 163/5, 163/6, 163/10C, 163/12, 163/13A, 163/13B, 163/13C, 163/13D, 163/13E, 163/13F, 163/14A, 181/1D1, 181/1D2, 181/1E1, 181/1E2, 181/1E3 & 117/14, 117/15.*
- *The existing lessee Mr.K.Moorthy and the proposed lease area by M/s.Sri Kanniammal Blue Metals, Proprietor, Mr.K.Kumar have decided to keep a common boundary in between to existing and new area in order to excavate the mineral from the 7.5m and agreed to maintain a common boundary as Regulation 111(3) Metalliferous Mines Regulations, 1961.*



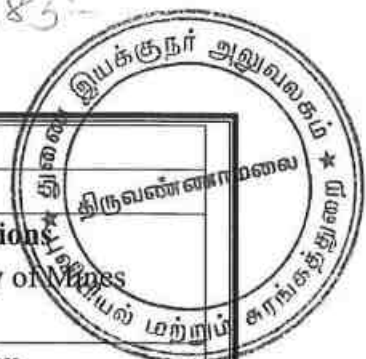
- d) **Geological resources and Mineable reserves:** Geological resource of estimated is **1692500m<sup>3</sup> or 4527438Ts** including the resources of safety zone, gravel etc. Of which, rough stone resources of about **1523250m<sup>3</sup> or 4188938Ts** and gravel is **169250m<sup>3</sup> or 338500Ts**. The total mineable reserve is estimated to be **471035m<sup>3</sup> or 1228139Ts** by deducting the reserve safety zone, block in benches from the total Geological resources. of which, rough stone is about **381425m<sup>3</sup> or 1048919Ts** and gravel is **89610m<sup>3</sup> or 179220Ts** up to a depth of 50m below ground level (Refer Plate No. IIIA & IVA).
- e) **Proposed Production Schedule:** Total proposed production of rough stone is **381425m<sup>3</sup> or 1048919Ts** and gravel is **89610m<sup>3</sup> or 179220Ts** up to a depth of 50m below ground level for five years plan period. (Refer Plate No.VIA).
- f) **Environmental Sensitivity of the proposed lease area: -**
- Interstate boundary:** There is no interstate boundary around 10Km radius periphery of proposed lease area.
  - Wildlife Sanctuaries any:** There are no notified wildlife sanctuaries within the radius of 10km from the project site under the wildlife (Protection) Act, 1972.
  - Forest (conservation) Act, 1980:** No forest land granted for quarrying and there is no reserve forest around 60m radius.
  - CRZ Notification, 2019:** There is no Sea coastal zone found within radius of 10km and this project site doesn't attract CRZ Notification, 2019.
- h) **Environmental measures to be adopted during the ongoing activity period,**
- 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.
  - Green Belt/Plantation will be developed around the project area and along the haul roads. The plantation minimizes propagation of noise.
  - 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.
  - 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                                                              | : | <b>M/s.Sri Kanniammal Blue Metals</b>                                                                                                                                                                            |
|    | Applicant address                                                                  | : | Proprietor, Mr.K.Kumar,<br>S/o.Kannaiyan,<br>S.No.660/2A, 2B, 2C, 2D, 660/1A, 1B,<br>Aarpakkam Village, Walajabad Taluk,                                                                                         |
|    | District                                                                           | : | Kancheepuram                                                                                                                                                                                                     |
|    | State                                                                              | : | Tamilnadu                                                                                                                                                                                                        |
|    | Pin code                                                                           | : | 631603                                                                                                                                                                                                           |
|    | Phone                                                                              | : | Nil                                                                                                                                                                                                              |
|    | 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 five (5) years.                                                                                                                  |
|    | Name of the QP preparing the Mining Plan                                           | : | <b>Dr. S.KARUPPANNAN.M.Sc.,Ph.D.,</b>                                                                                                                                                                            |
|    | Address                                                                            | : | <b>Geo Technical Mining Solutions</b><br>(A NABET Accredited & ISO certified Company)<br>No: 1/213-B, Natesan Complex,<br>Oddapatti, Collectorate Post office,<br>Dharmapuri-636705<br>Web site: www.gtmsind.com |
|    | Phone                                                                              | : | +91 9443937841, 7010076633                                                                                                                                                                                       |
|    | Fax                                                                                | : | Nil                                                                                                                                                                                                              |
|    | e-mail                                                                             | : | info.gtmsdpi@gmail.com                                                                                                                                                                                           |
|    | Telex                                                                              | : | Nil                                                                                                                                                                                                              |
|    | Registration number                                                                | : | Nil                                                                                                                                                                                                              |

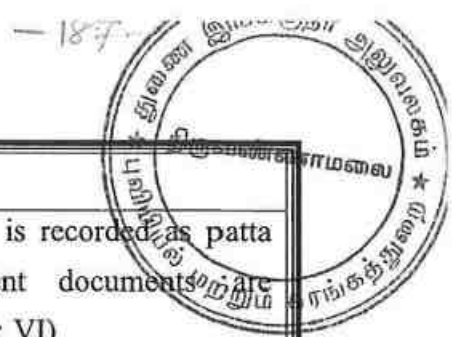




|    |                                                                    |   |                                                                                                                                                                          |
|----|--------------------------------------------------------------------|---|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|    | Date of grant/renewal                                              | : | Nil                                                                                                                                                                      |
|    | Valid upto                                                         | : | Nil                                                                                                                                                                      |
| f. | Name of the prospecting agency                                     | : | <b>Geo Technical Mining Solutions</b><br>GSR 286(E) No:272, Ministry of Mines<br>Notification 7th April 2022.                                                            |
|    | Address                                                            | : | No: 1/213-B, Natesan Complex,<br>Oddapatti,<br>Collectorate Post office,<br>Dharmapuri-636705<br>Web site: <a href="http://www.gtmsind.com">www.gtmsind.com</a>          |
|    | Phone                                                              | : | +91 9443937841, 7010076633                                                                                                                                               |
| g. | Reference No. and date of consent letter from the state government | : | The precise area communication letter issued by the Deputy Director, Department of Geology and Mining, Tiruvannamalai vide <b>Roc.No.172/Mines/2025 Dated 04.04.2025</b> |

## 2.0 LOCATION AND ACCESSIBILITY:

|                                                         |                      |              |                      |                                 |                                    |                            |                                                    |
|---------------------------------------------------------|----------------------|--------------|----------------------|---------------------------------|------------------------------------|----------------------------|----------------------------------------------------|
| a.                                                      | Details of the Area: |              | :                    | Refer plate no: IA & IB         |                                    |                            |                                                    |
|                                                         | District & State     |              | :                    | Tiruvannamalai, Tamil Nadu      |                                    |                            |                                                    |
|                                                         | Taluk                |              | :                    | Vembakkam                       |                                    |                            |                                                    |
|                                                         | Village              |              | :                    | Kundiyathandalam & Poonathangal |                                    |                            |                                                    |
| Khasra No./ Plot No./ Block Range/ Felling Series etc.: |                      |              |                      |                                 |                                    |                            |                                                    |
|                                                         | Survey No            | Sub Division | Total Extent in Hect | Patta No.                       | Village and Name of the Land Owner | Mine lease Applied S.F.No. | Mine lease Applied area out of total area in hect. |
|                                                         | 162                  | 1            | 0.11.0               | 918                             | Mr.K.Moorthy<br>S/o. Kannaiyan     | 162/1                      | 0.11.0                                             |
|                                                         | 162                  | 2A           | 0.07.0               |                                 |                                    | 162/2A                     | 0.07.0                                             |
|                                                         | 162                  | 2B           | 0.02.5               |                                 |                                    | 162/2B                     | 0.02.5                                             |
|                                                         | 162                  | 3            | 0.16.0               | 919                             |                                    | 162/3                      | 0.16.0                                             |
|                                                         | 162                  | 4            | 0.20.0               |                                 |                                    | 162/4                      | 0.20.0                                             |
|                                                         | 162                  | 5A           | 0.10.5               |                                 |                                    | 162/5A                     | 0.10.5                                             |
|                                                         | 162                  | 5B           | 0.07.0               |                                 |                                    | 162/5B                     | 0.07.0                                             |
|                                                         | 162                  | 6            | 0.08.0               | 918                             |                                    | 162/6                      | 0.08.0                                             |
|                                                         | 162                  | 7            | 0.11.5               | 919                             |                                    | 162/7                      | 0.11.5                                             |
|                                                         | 162                  | 8            | 0.22.0               |                                 |                                    | 162/8                      | 0.22.0                                             |
|                                                         | 162                  | 10A1         | 0.49.0               |                                 |                                    | 162/10A1                   | 0.49.0                                             |
|                                                         | 162                  | 10A2         | 0.21.0               | 674                             |                                    | 162/10A2                   | 0.21.0                                             |
|                                                         | 162                  | 10A3A        | 0.25.5               | 919                             |                                    | 162/10A3A                  | 0.25.5                                             |
|                                                         | 162                  | 10A3B        | 0.03.0               |                                 |                                    | 162/10A3B                  | 0.03.0                                             |
|                                                         | 117                  | 12A2         | 0.42.0               | 312                             |                                    | 117/12A2                   | 0.42.0                                             |
|                                                         | 144                  | 1A           | 0.42.08              |                                 |                                    | 144/1A                     | 0.42.08                                            |
|                                                         | 144                  | 2            | 0.40.5               |                                 |                                    | 144/2                      | 0.40.5                                             |
|                                                         | Total Extent         |              | 3.38.58              | Applied lease area extent       |                                    |                            | 3.38.58                                            |



| Lease area (hectares)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | : 3.38.58 Hectares                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |               |          |           |   |              |              |   |              |              |   |              |              |   |              |              |   |               |              |   |               |               |   |               |               |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------|----------|-----------|---|--------------|--------------|---|--------------|--------------|---|--------------|--------------|---|--------------|--------------|---|---------------|--------------|---|---------------|---------------|---|---------------|---------------|
| Whether the area is recorded to be in forest (please specify whether protected, reserved, etc)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | : The proposed lease area is recorded as patta land. Copy of Consent documents are enclosed. (Ref.Anne.No's: VI)                                                                                                                                                                                                                                                                                                                                                                                                       |               |          |           |   |              |              |   |              |              |   |              |              |   |              |              |   |               |              |   |               |               |   |               |               |
| Ownership / Occupancy                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | : This is a patta land S.F.No's. 162/1, 162/2A, 162/2B, 162/3, 162/4, 162/5A, 162/5B, 162/6, 162/7, 162/8, 162/10A1, 162/10A2, 162/10A3A, 162/10A3B and 117/12A2, 144/1A, 144/2 is registered on the name of Mr.K.Moorthy S/o. Kannaiyan as patta no.674, 918, 919 & 312. Hence the pattadhar given consent to the applicant.                                                                                                                                                                                          |               |          |           |   |              |              |   |              |              |   |              |              |   |              |              |   |               |              |   |               |               |   |               |               |
| Existence of Public Road / Railway line if any nearby and approximate distance                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | : <ul style="list-style-type: none"> <li>✓ Exploited quarry materials will be transported through the approach road is situated on the southeast side.</li> <li>✓ There is an NH-132B is situated on the Northern side about 9.3km which is connecting Kancheepuram-Chengalpattu Road.</li> <li>✓ There is an SH-118A is situated on the eastern side about 3.3km which is connecting Kancheepuram-Uthiramerur Road.</li> <li>✓ There is no railway line is situated around 5km radius from the lease area.</li> </ul> |               |          |           |   |              |              |   |              |              |   |              |              |   |              |              |   |               |              |   |               |               |   |               |               |
| Toposheet No. with latitude and longitude                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | : Toposheet No. 57 P/10<br>Latitude: From 12°43'59.10"N to 12°44'8.20"N<br>Longitude: From 79°42'55.27"E to 79°43'2.53"E                                                                                                                                                                                                                                                                                                                                                                                               |               |          |           |   |              |              |   |              |              |   |              |              |   |              |              |   |               |              |   |               |               |   |               |               |
| Geo-Coordinates of the lease boundary:                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |               |          |           |   |              |              |   |              |              |   |              |              |   |              |              |   |               |              |   |               |               |   |               |               |
| <table border="1"> <thead> <tr> <th>Sl.No</th> <th>LATITUDE</th> <th>LONGITUDE</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>12°44'7.73"N</td> <td>79°43'2.53"E</td> </tr> <tr> <td>2</td> <td>12°44'2.21"N</td> <td>79°43'1.40"E</td> </tr> <tr> <td>3</td> <td>12°44'1.45"N</td> <td>79°43'1.67"E</td> </tr> <tr> <td>4</td> <td>12°44'0.88"N</td> <td>79°43'1.41"E</td> </tr> <tr> <td>5</td> <td>12°43'59.10"N</td> <td>79°43'0.89"E</td> </tr> <tr> <td>6</td> <td>12°43'59.51"N</td> <td>79°42'58.74"E</td> </tr> <tr> <td>7</td> <td>12°43'59.80"N</td> <td>79°42'57.67"E</td> </tr> </tbody> </table> |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | Sl.No         | LATITUDE | LONGITUDE | 1 | 12°44'7.73"N | 79°43'2.53"E | 2 | 12°44'2.21"N | 79°43'1.40"E | 3 | 12°44'1.45"N | 79°43'1.67"E | 4 | 12°44'0.88"N | 79°43'1.41"E | 5 | 12°43'59.10"N | 79°43'0.89"E | 6 | 12°43'59.51"N | 79°42'58.74"E | 7 | 12°43'59.80"N | 79°42'57.67"E |
| Sl.No                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | LATITUDE                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | LONGITUDE     |          |           |   |              |              |   |              |              |   |              |              |   |              |              |   |               |              |   |               |               |   |               |               |
| 1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | 12°44'7.73"N                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | 79°43'2.53"E  |          |           |   |              |              |   |              |              |   |              |              |   |              |              |   |               |              |   |               |               |   |               |               |
| 2                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | 12°44'2.21"N                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | 79°43'1.40"E  |          |           |   |              |              |   |              |              |   |              |              |   |              |              |   |               |              |   |               |               |   |               |               |
| 3                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | 12°44'1.45"N                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | 79°43'1.67"E  |          |           |   |              |              |   |              |              |   |              |              |   |              |              |   |               |              |   |               |               |   |               |               |
| 4                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | 12°44'0.88"N                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | 79°43'1.41"E  |          |           |   |              |              |   |              |              |   |              |              |   |              |              |   |               |              |   |               |               |   |               |               |
| 5                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | 12°43'59.10"N                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | 79°43'0.89"E  |          |           |   |              |              |   |              |              |   |              |              |   |              |              |   |               |              |   |               |               |   |               |               |
| 6                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | 12°43'59.51"N                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | 79°42'58.74"E |          |           |   |              |              |   |              |              |   |              |              |   |              |              |   |               |              |   |               |               |   |               |               |
| 7                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | 12°43'59.80"N                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | 79°42'57.67"E |          |           |   |              |              |   |              |              |   |              |              |   |              |              |   |               |              |   |               |               |   |               |               |

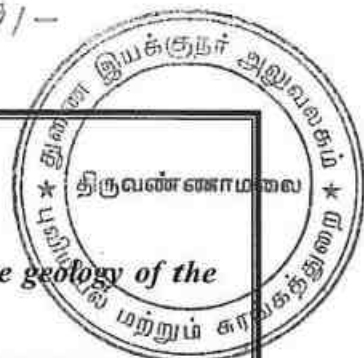


|                                                                                                                                                                                                                                                                                                                                                                              |    |              |                        |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----|--------------|------------------------|
|                                                                                                                                                                                                                                                                                                                                                                              | 8  | 12°44'0.02"N | 79°42'57.57"E          |
|                                                                                                                                                                                                                                                                                                                                                                              | 9  | 12°44'1.14"N | 79°42'58.01"E          |
|                                                                                                                                                                                                                                                                                                                                                                              | 10 | 12°44'1.33"N | 79°42'57.55"E          |
|                                                                                                                                                                                                                                                                                                                                                                              | 11 | 12°44'1.85"N | 79°42'55.71"E          |
|                                                                                                                                                                                                                                                                                                                                                                              | 12 | 12°44'3.64"N | 79°42'56.30"E          |
|                                                                                                                                                                                                                                                                                                                                                                              | 13 | 12°44'3.96"N | 79°42'55.27"E          |
|                                                                                                                                                                                                                                                                                                                                                                              | 14 | 12°44'4.97"N | 79°42'55.44"E          |
|                                                                                                                                                                                                                                                                                                                                                                              | 15 | 12°44'4.81"N | 79°42'56.07"E          |
|                                                                                                                                                                                                                                                                                                                                                                              | 16 | 12°44'4.95"N | 79°42'56.10"E          |
|                                                                                                                                                                                                                                                                                                                                                                              | 17 | 12°44'4.82"N | 79°42'56.72"E          |
|                                                                                                                                                                                                                                                                                                                                                                              | 18 | 12°44'6.06"N | 79°42'56.90"E          |
|                                                                                                                                                                                                                                                                                                                                                                              | 19 | 12°44'5.91"N | 79°42'58.01"E          |
|                                                                                                                                                                                                                                                                                                                                                                              | 20 | 12°44'5.65"N | 79°42'59.88"E          |
|                                                                                                                                                                                                                                                                                                                                                                              | 21 | 12°44'8.20"N | 79°43'0.97"E           |
| Land use pattern (Forest, Agricultural, Grazing, Barren etc.)                                                                                                                                                                                                                                                                                                                |    | :            | It is an barren Land.  |
| 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 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> |    | :            | Refer plate no-IA & IB |

**i) INFRASTRUCTURE AND COMMUNICATION:**

| S.No | Description              | Place          | Distance | Direction |
|------|--------------------------|----------------|----------|-----------|
| a.   | Nearest post office      | Vadakalpakkam  | 3.0Km    | Northwest |
| b.   | Nearest police station   | Magaral        | 4.2km    | East      |
| c.   | Nearest fire station     | Kancheepuram   | 11.0km   | North     |
| d.   | Nearest medical facility | Mamandur       | 4.7km    | West      |
| e.   | Nearest school           | Aarpakkam      | 4.5km    | East      |
| f.   | Nearest railway station  | Kancheepuram   | 11.5km   | North     |
| g.   | Nearest port facility    | Chennai        | 73.3km   | Northeast |
| h.   | Nearest airport          | Chennai        | 57.1km   | Northeast |
| i.   | Nearest DSP office       | Kancheepuram   | 10.0km   | North     |
| j.   | Nearest villages         | Poonathangal   | 1.1km    | North     |
|      |                          | Suruttal       | 1.8km    | East      |
|      |                          | Bagavandapuram | 1.0km    | South     |
|      |                          | Valavandal     | 2.8km    | 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 is flat topography. The maximum elevation (94m) was observed north side of the site. The slope is towards south side and falls in Toposheet no. <b>57 P/10</b> |
| (ii) | <p><b>General Geology of the District:</b></p> <p>The Entire district is underlain by the rocks belonging to hard crystalline rock masses of Archaean age. The Archaean rocks in this area are represented by rocks of eastern Ghat complex comprising charnockites, Migmatite complex of composite gneiss. The district is covered by metamorphic crystalline rocks of charnockite, composite gneiss of Archaean age. These rocks are highly metamorphosed and have been subjected to sever folding, crushing and faulting. Charnockites group is occupied by North and Southern part of the basin. The other rock type is encountered by composite granitic gneiss of Epidote hornblende biotite gneiss and hornblende biotite gneiss are occupy in the middle portion of the basin. Charnockite group occupies the high ground as well as plain and it is poorly weathered and jointed. They are generally black grey to dark grey in colour medium to coarse grained texture, and generally massive and un-foliated. A gneissic rock occurs as linear bands in the middle portion of the area and is highly migmatized. Mostly, micaceous with bands of granites, pegmatites, quartz veins the rock is well foliated. The Hornblende biotite gneiss forms the country rock of the area and epidote hornblende gneiss (Proterozoic age) occurs as small isolated outcrops. The crystalline formations are charnockite, granitic gneiss of Archean age have been intrude by dolerite dykes and pegmatite veins. These rocks are highly metamorphosed and have been subjected to very severe folding, crushing and faulting. The crystalline rocks are subjected to tectonic activities under various orogenic cycles resulting in the development of secondary structures such as joints, fissures and cleavages. The intensity of weathering varies from place to place. Highly weathered zones and granitic rock occurs in masses are around some of the villages like Ariyanallur, Mukkunam, Kaarunkuli Tondur, vedal,) Melokkur, Pennagar,</p> |                                                                                                                                                                                          |



Chinngam(57p/7). The general geological requence of formation is given in the Table

| Age     | Stage             | Lithology                         |
|---------|-------------------|-----------------------------------|
| Recent  | Migmatite         | Biotite Gneiss, Hornblende gneiss |
| Archean | Charnockite Group | Magnetite                         |

(iii) Local / Mine Geology of The Mineral Deposit:

**Topography of the proposed lease area:**

The applied lease area exhibits an flat topography and the maximum elevation 94m was observed north of the site. The rocks exhibits layered, medium to coarse grained hornblende biotite, orthopyroxene charnockite gneiss.

The Gravel is obtained the average of 0-5.0m and a rough stone starts from 5.0m to 50m (R.L.94-44m) from the surface level. The Surface plan showing elevation, contour, accessibility road and Geological map was prepared the proposed lease area.

**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.

**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.

**Chemical composition of rocks:**

Charnockite, any member of a series of metamorphic rocks with variable chemical composition, the term is often limited to the characteristic ortho pyroxene granite of the series. The alkali feldspar may be intermediate between microcline and orthoclase, the fine micro perthitic texture being common.

**Order of superposition of the proposed lease area,**

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

K. Kan.



|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                                                                                                                                                                                                                                                                                                                                                                            |   |                                                                                                                                                                      |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---|----------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| (iv)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | Drainage Pattern                                                                                                                                                                                                                                                                                                                                                           | : | There is no major river found within 50m radius. The drainage in the area is sub-dendritic in nature.                                                                |
| (b)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | <i>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:</i> |   |                                                                                                                                                                      |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | a. Present status:                                                                                                                                                                                                                                                                                                                                                         | : | The QP examined the surface features during survey. It is a fresh quarry lease.                                                                                      |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | b. Surface Plan                                                                                                                                                                                                                                                                                                                                                            | : | Surface plan showing elevation contour 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)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | <i>Broadly indicate the Yearwise future programme of exploration, taking into consideration the future production programme planned in next five years as in table below:-</i><br><br>No future programmed proposed in this area. Its massive homogeneous parent rock. Hence exploration proposal is not required to this mining project.                                  |   |                                                                                                                                                                      |
| <b>(e) Indicate geological and recoverable reserves and grade, duly supported by standard method of estimation and calculations along with required sections (giving split up of various categories i.e. proved, probable, possible). Indicate cut-off grade. Availability of resources should also be indicated for the entire leasehold.</b>                                                                                                                                                                                                                                                                                                                                                                                                                  |                                                                                                                                                                                                                                                                                                                                                                            |   |                                                                                                                                                                      |
| The geological resources were computed by cross section method with respect to the boundaries of the lease area. In this method, the lease area was divided into one longitudinal and two transverse section to calculate the volume of material up to the depth of 50m below ground level for five years plan period. (Refer Plate No. IIIA). The one longitudinal and two transverse cross section were assigned XY-AB & XY-CD as respectively. Using the cross-sectional method, total reserve is estimated to be <b>1692500m<sup>3</sup> or 4527438Ts</b> including the resources of safety zone, and gravel, etc. Of which, rough stone resources of about <b>1523250m<sup>3</sup> or 4188938Ts</b> and gravel is <b>169250m<sup>3</sup> or 338500Ts</b> . |                                                                                                                                                                                                                                                                                                                                                                            |   |                                                                                                                                                                      |

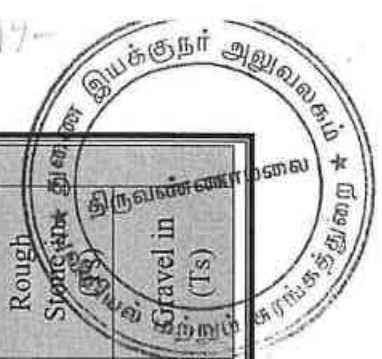


| GEOLOGICAL RESOURCES |       |               |              |              |                          |                               |                          |              |                     |                |
|----------------------|-------|---------------|--------------|--------------|--------------------------|-------------------------------|--------------------------|--------------|---------------------|----------------|
| Section              | Bench | Length in (m) | Width in (m) | Depth in (m) | Volume In m <sup>3</sup> | Rough Stone in m <sup>3</sup> | Gravel in m <sup>3</sup> | Bulk Density | Rough Stone in (Ts) | Gravel in (Ts) |
| XY-AB                | I     | 66            | 144          | 5            | 47520                    | .....                         | 47520                    | 2            | .....               | 95040          |
|                      | II    | 66            | 144          | 5            | 47520                    | 47520                         | .....                    | 2.75         | 130680              | .....          |
|                      | III   | 66            | 144          | 5            | 47520                    | 47520                         | .....                    | 2.75         | 130680              | .....          |
|                      | IV    | 66            | 144          | 5            | 47520                    | 47520                         | .....                    | 2.75         | 130680              | .....          |
|                      | V     | 66            | 144          | 5            | 47520                    | 47520                         | .....                    | 2.75         | 130680              | .....          |
|                      | VI    | 66            | 144          | 5            | 47520                    | 47520                         | .....                    | 2.75         | 130680              | .....          |
|                      | VII   | 66            | 144          | 5            | 47520                    | 47520                         | .....                    | 2.75         | 130680              | .....          |
|                      | VIII  | 66            | 144          | 5            | 47520                    | 47520                         | .....                    | 2.75         | 130680              | .....          |
|                      | IX    | 66            | 144          | 5            | 47520                    | 47520                         | .....                    | 2.75         | 130680              | .....          |
|                      | X     | 66            | 144          | 5            | 47520                    | 47520                         | .....                    | 2.75         | 130680              | .....          |
| <b>TOTAL</b>         |       |               |              | <b>50</b>    | <b>475200</b>            | <b>427680</b>                 | <b>47520</b>             | <b>.....</b> | <b>1176120</b>      | <b>95040</b>   |
| XY-CD                | I     | 94            | 259          | 5            | 121730                   | .....                         | 121730                   | 2            | .....               | 243460         |
|                      | II    | 94            | 259          | 5            | 121730                   | 121730                        | .....                    | 2.75         | 334758              | .....          |
|                      | III   | 94            | 259          | 5            | 121730                   | 121730                        | .....                    | 2.75         | 334758              | .....          |
|                      | IV    | 94            | 259          | 5            | 121730                   | 121730                        | .....                    | 2.75         | 334758              | .....          |
|                      | V     | 94            | 259          | 5            | 121730                   | 121730                        | .....                    | 2.75         | 334758              | .....          |
|                      | VI    | 94            | 259          | 5            | 121730                   | 121730                        | .....                    | 2.75         | 334758              | .....          |
|                      | VII   | 94            | 259          | 5            | 121730                   | 121730                        | .....                    | 2.75         | 334758              | .....          |
|                      | VIII  | 94            | 259          | 5            | 121730                   | 121730                        | .....                    | 2.75         | 334758              | .....          |
|                      | IX    | 94            | 259          | 5            | 121730                   | 121730                        | .....                    | 2.75         | 334758              | .....          |
|                      | X     | 94            | 259          | 5            | 121730                   | 121730                        | .....                    | 2.75         | 334758              | .....          |
| <b>TOTAL</b>         |       |               |              | <b>50</b>    | <b>1217300</b>           | <b>1095570</b>                | <b>121730</b>            | <b>.....</b> | <b>3012818</b>      | <b>243460</b>  |
| <b>GRAND TOTAL</b>   |       |               |              |              | <b>1692500</b>           | <b>1523250</b>                | <b>169250</b>            | <b>.....</b> | <b>4188938</b>      | <b>338500</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 **471035m<sup>3</sup>** or **1228139Ts** by deducting the reserve safety zone, block in benches from the total Geological resources up to a depth of 50m below ground level. Of which, rough stone is about **381425m<sup>3</sup>** or **1048919Ts** and gravel is **89610m<sup>3</sup>** or **179220Ts**. 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's IVA)





| MINEABLE RESERVES |       |               |              |              |                          |                               |                          |              |                               |                |
|-------------------|-------|---------------|--------------|--------------|--------------------------|-------------------------------|--------------------------|--------------|-------------------------------|----------------|
| Section           | Bench | Length in (m) | Width in (m) | Depth in (m) | Volume in m <sup>3</sup> | Rough Stone in m <sup>3</sup> | Gravel in m <sup>3</sup> | Bulk Density | Rough Stone in m <sup>3</sup> | Gravel in (Ts) |
| XY-AB             | I     | 58            | 94           | 5            | 27260                    | .....                         | 27260                    | 2            | .....                         | 54520          |
|                   | II    | 53            | 89           | 5            | 23585                    | 23585                         | .....                    | 2.75         | 64859                         | .....          |
|                   | III   | 48            | 66           | 5            | 15840                    | 15840                         | .....                    | 2.75         | 43560                         | .....          |
|                   | IV    | 43            | 56           | 5            | 12040                    | 12040                         | .....                    | 2.75         | 33110                         | .....          |
|                   | V     | 38            | 46           | 5            | 8740                     | 8740                          | .....                    | 2.75         | 24035                         | .....          |
|                   | VI    | 33            | 36           | 5            | 5940                     | 5940                          | .....                    | 2.75         | 16335                         | .....          |
|                   | VII   | 28            | 26           | 5            | 3640                     | 3640                          | .....                    | 2.75         | 10010                         | .....          |
|                   | VIII  | 23            | 16           | 5            | 1840                     | 1840                          | .....                    | 2.75         | 5060                          | .....          |
| TOTAL             |       |               |              | 40           | 98885                    | 71625                         | 27260                    | .....        | 196969                        | 54520          |
| XY-CD             | I     | 86            | 145          | 5            | 62350                    | .....                         | 62350                    | 2            | .....                         | 124700         |
|                   | II    | 81            | 140          | 5            | 56700                    | 56700                         | .....                    | 2.75         | 155925                        | .....          |
|                   | III   | 76            | 135          | 5            | 51300                    | 51300                         | .....                    | 2.75         | 141075                        | .....          |
|                   | IV    | 71            | 130          | 5            | 46150                    | 46150                         | .....                    | 2.75         | 126913                        | .....          |
|                   | V     | 66            | 125          | 5            | 41250                    | 41250                         | .....                    | 2.75         | 113438                        | .....          |
|                   | VI    | 61            | 120          | 5            | 36600                    | 36600                         | .....                    | 2.75         | 100650                        | .....          |
|                   | VII   | 56            | 115          | 5            | 32200                    | 32200                         | .....                    | 2.75         | 88550                         | .....          |
|                   | VIII  | 51            | 110          | 5            | 28050                    | 28050                         | .....                    | 2.75         | 77138                         | .....          |
|                   | IX    | 22            | 105          | 5            | 11550                    | 11550                         | .....                    | 2.75         | 31763                         | .....          |
|                   | X     | 12            | 100          | 5            | 6000                     | 6000                          | .....                    | 2.75         | 16500                         | .....          |
| TOTAL             |       |               |              | 50           | 372150                   | 309800                        | 62350                    | .....        | 851950                        | 124700         |
| GRAND TOTAL       |       |               |              |              | 471035                   | 381425                        | 89610                    | .....        | 1048919                       | 179220         |

#### 4.0 MINING:

|    |                                                                                                                                                                                                                           |   |                                                                                                                                                                                                                                                                                                                                                                      |
|----|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| a) | Briefly describe the existing / proposed method for developing / working the deposit with all design parameters.<br>(Note: In case of pocket deposits, sequence of development/working may be indicated on the same plan) | : | The mining operation is open-cast, semi-mechanized method are adopted and on single shift basis only. Under the regulation 106 of the Metalliferous Mines Regulations, 1961, in all open cast workings in hard rock, the benches and sides should be properly benched and sloped. The bench height should not exceed 6m 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 rough stone is about 381425m <sup>3</sup> or 1048919Ts and gravel is 89610m <sup>3</sup> or 179220Ts up to a depth of 50m below ground level for five years plan period. (Refer Plate No's. VIA). |                                                                                                          |            |                                      |                       |                                               |                                  |                                      |                                                |                                   |                                   |                                                                               |
|                                                                                                                                                                                                                             | Year                                                                                                     | Pit No.(s) | Topsoil/Overburden (m <sup>3</sup> ) | ROM (m <sup>3</sup> ) | Saleable rough stone (m <sup>3</sup> ) @ 100% | Saleable rough stone (Ts) @ 100% | Rough stone rejects(m <sup>3</sup> ) | Sub grade/Weathered rock (m <sup>3</sup> )     | Saleable Gravel (m <sup>3</sup> ) | Saleable Gravel (m <sup>3</sup> ) | Rough stone to waste ratio                                                    |
|                                                                                                                                                                                                                             | I                                                                                                        | I          | ...                                  | 99975                 | 61840                                         | 170060                           | ...                                  | ...                                            | 38135                             | 76270                             | ...                                                                           |
|                                                                                                                                                                                                                             | II                                                                                                       | I          | ...                                  | 96250                 | 70875                                         | 194907                           | ...                                  | ...                                            | 25375                             | 50750                             | ...                                                                           |
|                                                                                                                                                                                                                             | III                                                                                                      | I          | ...                                  | 99000                 | 72900                                         | 200475                           | ...                                  | ...                                            | 26100                             | 52200                             | ...                                                                           |
|                                                                                                                                                                                                                             | IV                                                                                                       | I          | ...                                  | 92530                 | 92530                                         | 254457                           | ...                                  | ...                                            | ...                               | ...                               | ...                                                                           |
|                                                                                                                                                                                                                             | V                                                                                                        | I          | ...                                  | 83280                 | 83280                                         | 229020                           | ...                                  | ...                                            | ...                               | ...                               | ...                                                                           |
|                                                                                                                                                                                                                             | Grand Total                                                                                              |            | ...                                  | 471035                | 381425                                        | 1048919                          | ...                                  | ...                                            | 89610                             | 179220                            | ...                                                                           |
| c)                                                                                                                                                                                                                          | Composite plans and Year wise sections (In case of 'A' class mines):                                     |            |                                      |                       |                                               |                                  | :                                    | Not applicable. It is a "B" class quarry lease |                                   |                                   |                                                                               |

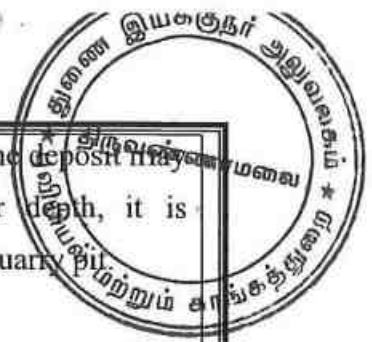
| YEARWISE PRODUCTION RESERVES |         |       |               |              |              |                          |                                  |                          |              |                        |                |
|------------------------------|---------|-------|---------------|--------------|--------------|--------------------------|----------------------------------|--------------------------|--------------|------------------------|----------------|
| Year                         | Section | Bench | Length in (m) | Width in (m) | Depth in (m) | Volume In m <sup>3</sup> | Rough Stone<br>in m <sup>3</sup> | Gravel in m <sup>3</sup> | Bulk Density | Rough Stone<br>in (Ts) | Gravel in (Ts) |
| I-YEAR                       | XY-AB   | I     | 58            | 94           | 5            | 27260                    | .....                            | 27260                    | 2            | .....                  | 54520          |
|                              |         | II    | 53            | 89           | 5            | 23585                    | 23585                            | .....                    | 2.75         | 64859                  | .....          |
|                              |         | III   | 48            | 66           | 5            | 15840                    | 15840                            | .....                    | 2.75         | 43560                  | .....          |
|                              |         | IV    | 43            | 56           | 5            | 12040                    | 12040                            | .....                    | 2.75         | 33110                  | .....          |
|                              | XY-CD   | I     | 15            | 145          | 5            | 10875                    | .....                            | 10875                    | 2            | .....                  | 21750          |
|                              |         | II    | 10            | 140          | 5            | 7000                     | 7000                             | .....                    | 2.75         | 19250                  | .....          |
|                              |         | III   | 5             | 135          | 5            | 3375                     | 3375                             | .....                    | 2.75         | 9281                   | .....          |
| TOTAL                        |         |       |               |              |              | 99975                    | 61840                            | 38135                    | .....        | 170060                 | 76270          |
| II-YEAR                      | XY-CD   | I     | 35            | 145          | 5            | 25375                    | .....                            | 25375                    | 2            | .....                  | 50750          |
|                              |         | II    | 35            | 140          | 5            | 24500                    | 24500                            | .....                    | 2.75         | 67375                  | .....          |
|                              |         | III   | 35            | 135          | 5            | 23625                    | 23625                            | .....                    | 2.75         | 64969                  | .....          |
|                              |         | IV    | 35            | 130          | 5            | 22750                    | 22750                            | .....                    | 2.75         | 62563                  | .....          |
| TOTAL                        |         |       |               |              |              | 96250                    | 70875                            | 25375                    | .....        | 194907                 | 50750          |

|             |       |      |    |     |        |        |       |       |         |        |       |
|-------------|-------|------|----|-----|--------|--------|-------|-------|---------|--------|-------|
| III-YEAR    | XY-CD | I    | 36 | 145 | 5      | 26100  | ..... | 26100 | 2       | .....  | 52200 |
|             |       | II   | 36 | 140 | 5      | 25200  | 25200 | ..... | 2.75    | 69300  | ..... |
|             |       | III  | 36 | 135 | 5      | 24300  | 24300 | ..... | 2.75    | 66825  | ..... |
|             |       | IV   | 36 | 130 | 5      | 23400  | 23400 | ..... | 2.75    | 64350  | ..... |
| TOTAL       |       |      |    |     | 99000  | 72900  | 26100 | ..... | 200475  | 52200  |       |
| IV-YEAR     | XY-AB | V    | 38 | 46  | 5      | 8740   | 8740  | ..... | 2.75    | 24035  | ..... |
|             |       | VI   | 33 | 36  | 5      | 5940   | 5940  | ..... | 2.75    | 16335  | ..... |
|             | XY-CD | V    | 66 | 125 | 5      | 41250  | 41250 | ..... | 2.75    | 113438 | ..... |
|             |       | VI   | 61 | 120 | 5      | 36600  | 36600 | ..... | 2.75    | 100650 | ..... |
|             | TOTAL |      |    |     |        | 92530  | 92530 | 0     | .....   | 254457 | 0     |
| V-YEAR      | XY-AB | VII  | 28 | 26  | 5      | 3640   | 3640  | ..... | 2.75    | 10010  | ..... |
|             |       | VIII | 23 | 16  | 5      | 1840   | 1840  | ..... | 2.75    | 5060   | ..... |
|             | XY-CD | VII  | 56 | 115 | 5      | 32200  | 32200 | ..... | 2.75    | 88550  | ..... |
|             |       | VIII | 51 | 110 | 5      | 28050  | 28050 | ..... | 2.75    | 77138  | ..... |
|             |       | IX   | 22 | 105 | 5      | 11550  | 11550 | ..... | 2.75    | 31763  | ..... |
|             |       | X    | 12 | 100 | 5      | 6000   | 6000  | ..... | 2.75    | 16500  | ..... |
|             | TOTAL |      |    |     |        | 83280  | 83280 | 0     | .....   | 229020 | 0     |
| GRAND TOTAL |       |      |    |     | 471035 | 381425 | 89610 | ..... | 1048919 | 179220 |       |

|    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |   |                                                         |
|----|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---|---------------------------------------------------------|
| d) | Attach supporting composite plan and section showing pit layouts, dumps, stacks of sub-grade mineral, if any, etc.                                                                                                                                                                                                                                                                                                                                                                                                          | : | Composite plan not prepared in this proposed lease area |
| e) | <i>Indicate proposed rate of production when the mine is fully developed and the expected life of the mine and the year from which effected:</i><br><br>At this rate of production, the expected life of quarry is calculated as given below:<br><br><b><u>Rough stone:</u></b><br>Mineable reserves of rough stone (5 Years) = 381425m <sup>3</sup> or 1048919Ts<br>Annual Peak production = 92530m <sup>3</sup> or 254457Ts<br><br><b><u>Gravel:</u></b><br>Mineable reserves of gravel = 89610m <sup>3</sup> or 179220Ts |   |                                                         |
| f) | <i>Attach a note furnishing a conceptual mining plan for the entire lease period (for "B" category mines) and upto the life of the mine (for "A" category mines) based on the geological, mining and environments considerations:</i>                                                                                                                                                                                                                                                                                       |   |                                                         |
| i) | Time frame of completion of                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | : | Considering the indefinite depth persistence            |

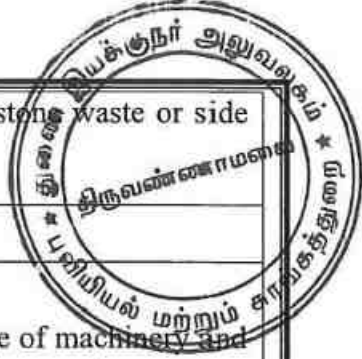
|               | mineral exploration program in leasehold area: Give broad description identified potential areas to be covered in the given time frame:                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | of the rough stone deposit is proved beyond the workable limits about up to a depth of 50m below ground level (R.L.94m to 44m) from the petrogenetic character of the charnockite 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 5 years. |       |       |       |  |  |       |        |                     |       |       |       |   |                        |        |    |    |   |    |             |    |    |   |     |    |    |   |    |    |    |   |   |    |    |   |    |    |    |   |     |    |    |   |      |    |    |   |             |  |  |  |  |    |               |  |  |  |  |  |       |        |                     |       |       |       |   |                        |        |    |     |   |    |             |    |     |   |     |    |     |   |    |    |     |   |   |    |     |   |    |    |     |   |     |    |     |   |      |    |     |   |    |    |     |   |   |    |     |   |             |  |  |  |  |    |  |
|---------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------|-------|-------|--|--|-------|--------|---------------------|-------|-------|-------|---|------------------------|--------|----|----|---|----|-------------|----|----|---|-----|----|----|---|----|----|----|---|---|----|----|---|----|----|----|---|-----|----|----|---|------|----|----|---|-------------|--|--|--|--|----|---------------|--|--|--|--|--|-------|--------|---------------------|-------|-------|-------|---|------------------------|--------|----|-----|---|----|-------------|----|-----|---|-----|----|-----|---|----|----|-----|---|---|----|-----|---|----|----|-----|---|-----|----|-----|---|------|----|-----|---|----|----|-----|---|---|----|-----|---|-------------|--|--|--|--|----|--|
| ii)           | <p>Whether ultimate pit limit has been determined and demarcated on surface and geological plan :-</p> <p>The ultimate pit limit has been determined and demarcated in the conceptual plan</p> <table><tr><th colspan="6">SECTION XY-AB</th></tr><tr><th>Bench</th><th>Period</th><th>Overburden/ Mineral</th><th>L (m)</th><th>W (m)</th><th>D (m)</th></tr><tr><td>I</td><td rowspan="8">Five years Plan period</td><td>Gravel</td><td>58</td><td>94</td><td>5</td></tr><tr><td>II</td><td rowspan="7">Rough stone</td><td>53</td><td>89</td><td>5</td></tr><tr><td>III</td><td>48</td><td>66</td><td>5</td></tr><tr><td>IV</td><td>43</td><td>56</td><td>5</td></tr><tr><td>V</td><td>38</td><td>46</td><td>5</td></tr><tr><td>VI</td><td>33</td><td>36</td><td>5</td></tr><tr><td>VII</td><td>28</td><td>26</td><td>5</td></tr><tr><td>VIII</td><td>23</td><td>16</td><td>5</td></tr><tr><td colspan="5">Total Depth</td><td>40</td></tr><tr><th colspan="6">SECTION XY-CD</th></tr><tr><th>Bench</th><th>Period</th><th>Overburden/ Mineral</th><th>L (m)</th><th>W (m)</th><th>D (m)</th></tr><tr><td>I</td><td rowspan="11">Five years Plan period</td><td>Gravel</td><td>86</td><td>145</td><td>5</td></tr><tr><td>II</td><td rowspan="10">Rough stone</td><td>81</td><td>140</td><td>5</td></tr><tr><td>III</td><td>76</td><td>135</td><td>5</td></tr><tr><td>IV</td><td>71</td><td>130</td><td>5</td></tr><tr><td>V</td><td>66</td><td>125</td><td>5</td></tr><tr><td>VI</td><td>61</td><td>120</td><td>5</td></tr><tr><td>VII</td><td>56</td><td>115</td><td>5</td></tr><tr><td>VIII</td><td>51</td><td>110</td><td>5</td></tr><tr><td>IX</td><td>22</td><td>105</td><td>5</td></tr><tr><td>X</td><td>12</td><td>100</td><td>5</td></tr><tr><td colspan="5">Total Depth</td><td>50</td></tr></table> | SECTION XY-AB                                                                                                                                                                                                                                                                                                                          |       |       |       |  |  | Bench | Period | Overburden/ Mineral | L (m) | W (m) | D (m) | I | Five years Plan period | Gravel | 58 | 94 | 5 | II | Rough stone | 53 | 89 | 5 | III | 48 | 66 | 5 | IV | 43 | 56 | 5 | V | 38 | 46 | 5 | VI | 33 | 36 | 5 | VII | 28 | 26 | 5 | VIII | 23 | 16 | 5 | Total Depth |  |  |  |  | 40 | SECTION XY-CD |  |  |  |  |  | Bench | Period | Overburden/ Mineral | L (m) | W (m) | D (m) | I | Five years Plan period | Gravel | 86 | 145 | 5 | II | Rough stone | 81 | 140 | 5 | III | 76 | 135 | 5 | IV | 71 | 130 | 5 | V | 66 | 125 | 5 | VI | 61 | 120 | 5 | VII | 56 | 115 | 5 | VIII | 51 | 110 | 5 | IX | 22 | 105 | 5 | X | 12 | 100 | 5 | Total Depth |  |  |  |  | 50 |  |
| SECTION XY-AB |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                                                                                                                                                                                                                                                                                                                                        |       |       |       |  |  |       |        |                     |       |       |       |   |                        |        |    |    |   |    |             |    |    |   |     |    |    |   |    |    |    |   |   |    |    |   |    |    |    |   |     |    |    |   |      |    |    |   |             |  |  |  |  |    |               |  |  |  |  |  |       |        |                     |       |       |       |   |                        |        |    |     |   |    |             |    |     |   |     |    |     |   |    |    |     |   |   |    |     |   |    |    |     |   |     |    |     |   |      |    |     |   |    |    |     |   |   |    |     |   |             |  |  |  |  |    |  |
| Bench         | Period                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | Overburden/ Mineral                                                                                                                                                                                                                                                                                                                    | L (m) | W (m) | D (m) |  |  |       |        |                     |       |       |       |   |                        |        |    |    |   |    |             |    |    |   |     |    |    |   |    |    |    |   |   |    |    |   |    |    |    |   |     |    |    |   |      |    |    |   |             |  |  |  |  |    |               |  |  |  |  |  |       |        |                     |       |       |       |   |                        |        |    |     |   |    |             |    |     |   |     |    |     |   |    |    |     |   |   |    |     |   |    |    |     |   |     |    |     |   |      |    |     |   |    |    |     |   |   |    |     |   |             |  |  |  |  |    |  |
| I             | Five years Plan period                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | Gravel                                                                                                                                                                                                                                                                                                                                 | 58    | 94    | 5     |  |  |       |        |                     |       |       |       |   |                        |        |    |    |   |    |             |    |    |   |     |    |    |   |    |    |    |   |   |    |    |   |    |    |    |   |     |    |    |   |      |    |    |   |             |  |  |  |  |    |               |  |  |  |  |  |       |        |                     |       |       |       |   |                        |        |    |     |   |    |             |    |     |   |     |    |     |   |    |    |     |   |   |    |     |   |    |    |     |   |     |    |     |   |      |    |     |   |    |    |     |   |   |    |     |   |             |  |  |  |  |    |  |
| II            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | Rough stone                                                                                                                                                                                                                                                                                                                            | 53    | 89    | 5     |  |  |       |        |                     |       |       |       |   |                        |        |    |    |   |    |             |    |    |   |     |    |    |   |    |    |    |   |   |    |    |   |    |    |    |   |     |    |    |   |      |    |    |   |             |  |  |  |  |    |               |  |  |  |  |  |       |        |                     |       |       |       |   |                        |        |    |     |   |    |             |    |     |   |     |    |     |   |    |    |     |   |   |    |     |   |    |    |     |   |     |    |     |   |      |    |     |   |    |    |     |   |   |    |     |   |             |  |  |  |  |    |  |
| III           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                                                                                                                                                                                                                                                                                                                                        | 48    | 66    | 5     |  |  |       |        |                     |       |       |       |   |                        |        |    |    |   |    |             |    |    |   |     |    |    |   |    |    |    |   |   |    |    |   |    |    |    |   |     |    |    |   |      |    |    |   |             |  |  |  |  |    |               |  |  |  |  |  |       |        |                     |       |       |       |   |                        |        |    |     |   |    |             |    |     |   |     |    |     |   |    |    |     |   |   |    |     |   |    |    |     |   |     |    |     |   |      |    |     |   |    |    |     |   |   |    |     |   |             |  |  |  |  |    |  |
| IV            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                                                                                                                                                                                                                                                                                                                                        | 43    | 56    | 5     |  |  |       |        |                     |       |       |       |   |                        |        |    |    |   |    |             |    |    |   |     |    |    |   |    |    |    |   |   |    |    |   |    |    |    |   |     |    |    |   |      |    |    |   |             |  |  |  |  |    |               |  |  |  |  |  |       |        |                     |       |       |       |   |                        |        |    |     |   |    |             |    |     |   |     |    |     |   |    |    |     |   |   |    |     |   |    |    |     |   |     |    |     |   |      |    |     |   |    |    |     |   |   |    |     |   |             |  |  |  |  |    |  |
| V             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                                                                                                                                                                                                                                                                                                                                        | 38    | 46    | 5     |  |  |       |        |                     |       |       |       |   |                        |        |    |    |   |    |             |    |    |   |     |    |    |   |    |    |    |   |   |    |    |   |    |    |    |   |     |    |    |   |      |    |    |   |             |  |  |  |  |    |               |  |  |  |  |  |       |        |                     |       |       |       |   |                        |        |    |     |   |    |             |    |     |   |     |    |     |   |    |    |     |   |   |    |     |   |    |    |     |   |     |    |     |   |      |    |     |   |    |    |     |   |   |    |     |   |             |  |  |  |  |    |  |
| VI            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                                                                                                                                                                                                                                                                                                                                        | 33    | 36    | 5     |  |  |       |        |                     |       |       |       |   |                        |        |    |    |   |    |             |    |    |   |     |    |    |   |    |    |    |   |   |    |    |   |    |    |    |   |     |    |    |   |      |    |    |   |             |  |  |  |  |    |               |  |  |  |  |  |       |        |                     |       |       |       |   |                        |        |    |     |   |    |             |    |     |   |     |    |     |   |    |    |     |   |   |    |     |   |    |    |     |   |     |    |     |   |      |    |     |   |    |    |     |   |   |    |     |   |             |  |  |  |  |    |  |
| VII           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                                                                                                                                                                                                                                                                                                                                        | 28    | 26    | 5     |  |  |       |        |                     |       |       |       |   |                        |        |    |    |   |    |             |    |    |   |     |    |    |   |    |    |    |   |   |    |    |   |    |    |    |   |     |    |    |   |      |    |    |   |             |  |  |  |  |    |               |  |  |  |  |  |       |        |                     |       |       |       |   |                        |        |    |     |   |    |             |    |     |   |     |    |     |   |    |    |     |   |   |    |     |   |    |    |     |   |     |    |     |   |      |    |     |   |    |    |     |   |   |    |     |   |             |  |  |  |  |    |  |
| VIII          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                                                                                                                                                                                                                                                                                                                                        | 23    | 16    | 5     |  |  |       |        |                     |       |       |       |   |                        |        |    |    |   |    |             |    |    |   |     |    |    |   |    |    |    |   |   |    |    |   |    |    |    |   |     |    |    |   |      |    |    |   |             |  |  |  |  |    |               |  |  |  |  |  |       |        |                     |       |       |       |   |                        |        |    |     |   |    |             |    |     |   |     |    |     |   |    |    |     |   |   |    |     |   |    |    |     |   |     |    |     |   |      |    |     |   |    |    |     |   |   |    |     |   |             |  |  |  |  |    |  |
| Total Depth   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                                                                                                                                                                                                                                                                                                                                        |       |       | 40    |  |  |       |        |                     |       |       |       |   |                        |        |    |    |   |    |             |    |    |   |     |    |    |   |    |    |    |   |   |    |    |   |    |    |    |   |     |    |    |   |      |    |    |   |             |  |  |  |  |    |               |  |  |  |  |  |       |        |                     |       |       |       |   |                        |        |    |     |   |    |             |    |     |   |     |    |     |   |    |    |     |   |   |    |     |   |    |    |     |   |     |    |     |   |      |    |     |   |    |    |     |   |   |    |     |   |             |  |  |  |  |    |  |
| SECTION XY-CD |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                                                                                                                                                                                                                                                                                                                                        |       |       |       |  |  |       |        |                     |       |       |       |   |                        |        |    |    |   |    |             |    |    |   |     |    |    |   |    |    |    |   |   |    |    |   |    |    |    |   |     |    |    |   |      |    |    |   |             |  |  |  |  |    |               |  |  |  |  |  |       |        |                     |       |       |       |   |                        |        |    |     |   |    |             |    |     |   |     |    |     |   |    |    |     |   |   |    |     |   |    |    |     |   |     |    |     |   |      |    |     |   |    |    |     |   |   |    |     |   |             |  |  |  |  |    |  |
| Bench         | Period                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | Overburden/ Mineral                                                                                                                                                                                                                                                                                                                    | L (m) | W (m) | D (m) |  |  |       |        |                     |       |       |       |   |                        |        |    |    |   |    |             |    |    |   |     |    |    |   |    |    |    |   |   |    |    |   |    |    |    |   |     |    |    |   |      |    |    |   |             |  |  |  |  |    |               |  |  |  |  |  |       |        |                     |       |       |       |   |                        |        |    |     |   |    |             |    |     |   |     |    |     |   |    |    |     |   |   |    |     |   |    |    |     |   |     |    |     |   |      |    |     |   |    |    |     |   |   |    |     |   |             |  |  |  |  |    |  |
| I             | Five years Plan period                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | Gravel                                                                                                                                                                                                                                                                                                                                 | 86    | 145   | 5     |  |  |       |        |                     |       |       |       |   |                        |        |    |    |   |    |             |    |    |   |     |    |    |   |    |    |    |   |   |    |    |   |    |    |    |   |     |    |    |   |      |    |    |   |             |  |  |  |  |    |               |  |  |  |  |  |       |        |                     |       |       |       |   |                        |        |    |     |   |    |             |    |     |   |     |    |     |   |    |    |     |   |   |    |     |   |    |    |     |   |     |    |     |   |      |    |     |   |    |    |     |   |   |    |     |   |             |  |  |  |  |    |  |
| II            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | Rough stone                                                                                                                                                                                                                                                                                                                            | 81    | 140   | 5     |  |  |       |        |                     |       |       |       |   |                        |        |    |    |   |    |             |    |    |   |     |    |    |   |    |    |    |   |   |    |    |   |    |    |    |   |     |    |    |   |      |    |    |   |             |  |  |  |  |    |               |  |  |  |  |  |       |        |                     |       |       |       |   |                        |        |    |     |   |    |             |    |     |   |     |    |     |   |    |    |     |   |   |    |     |   |    |    |     |   |     |    |     |   |      |    |     |   |    |    |     |   |   |    |     |   |             |  |  |  |  |    |  |
| III           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                                                                                                                                                                                                                                                                                                                                        | 76    | 135   | 5     |  |  |       |        |                     |       |       |       |   |                        |        |    |    |   |    |             |    |    |   |     |    |    |   |    |    |    |   |   |    |    |   |    |    |    |   |     |    |    |   |      |    |    |   |             |  |  |  |  |    |               |  |  |  |  |  |       |        |                     |       |       |       |   |                        |        |    |     |   |    |             |    |     |   |     |    |     |   |    |    |     |   |   |    |     |   |    |    |     |   |     |    |     |   |      |    |     |   |    |    |     |   |   |    |     |   |             |  |  |  |  |    |  |
| IV            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                                                                                                                                                                                                                                                                                                                                        | 71    | 130   | 5     |  |  |       |        |                     |       |       |       |   |                        |        |    |    |   |    |             |    |    |   |     |    |    |   |    |    |    |   |   |    |    |   |    |    |    |   |     |    |    |   |      |    |    |   |             |  |  |  |  |    |               |  |  |  |  |  |       |        |                     |       |       |       |   |                        |        |    |     |   |    |             |    |     |   |     |    |     |   |    |    |     |   |   |    |     |   |    |    |     |   |     |    |     |   |      |    |     |   |    |    |     |   |   |    |     |   |             |  |  |  |  |    |  |
| V             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                                                                                                                                                                                                                                                                                                                                        | 66    | 125   | 5     |  |  |       |        |                     |       |       |       |   |                        |        |    |    |   |    |             |    |    |   |     |    |    |   |    |    |    |   |   |    |    |   |    |    |    |   |     |    |    |   |      |    |    |   |             |  |  |  |  |    |               |  |  |  |  |  |       |        |                     |       |       |       |   |                        |        |    |     |   |    |             |    |     |   |     |    |     |   |    |    |     |   |   |    |     |   |    |    |     |   |     |    |     |   |      |    |     |   |    |    |     |   |   |    |     |   |             |  |  |  |  |    |  |
| VI            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                                                                                                                                                                                                                                                                                                                                        | 61    | 120   | 5     |  |  |       |        |                     |       |       |       |   |                        |        |    |    |   |    |             |    |    |   |     |    |    |   |    |    |    |   |   |    |    |   |    |    |    |   |     |    |    |   |      |    |    |   |             |  |  |  |  |    |               |  |  |  |  |  |       |        |                     |       |       |       |   |                        |        |    |     |   |    |             |    |     |   |     |    |     |   |    |    |     |   |   |    |     |   |    |    |     |   |     |    |     |   |      |    |     |   |    |    |     |   |   |    |     |   |             |  |  |  |  |    |  |
| VII           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                                                                                                                                                                                                                                                                                                                                        | 56    | 115   | 5     |  |  |       |        |                     |       |       |       |   |                        |        |    |    |   |    |             |    |    |   |     |    |    |   |    |    |    |   |   |    |    |   |    |    |    |   |     |    |    |   |      |    |    |   |             |  |  |  |  |    |               |  |  |  |  |  |       |        |                     |       |       |       |   |                        |        |    |     |   |    |             |    |     |   |     |    |     |   |    |    |     |   |   |    |     |   |    |    |     |   |     |    |     |   |      |    |     |   |    |    |     |   |   |    |     |   |             |  |  |  |  |    |  |
| VIII          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                                                                                                                                                                                                                                                                                                                                        | 51    | 110   | 5     |  |  |       |        |                     |       |       |       |   |                        |        |    |    |   |    |             |    |    |   |     |    |    |   |    |    |    |   |   |    |    |   |    |    |    |   |     |    |    |   |      |    |    |   |             |  |  |  |  |    |               |  |  |  |  |  |       |        |                     |       |       |       |   |                        |        |    |     |   |    |             |    |     |   |     |    |     |   |    |    |     |   |   |    |     |   |    |    |     |   |     |    |     |   |      |    |     |   |    |    |     |   |   |    |     |   |             |  |  |  |  |    |  |
| IX            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                                                                                                                                                                                                                                                                                                                                        | 22    | 105   | 5     |  |  |       |        |                     |       |       |       |   |                        |        |    |    |   |    |             |    |    |   |     |    |    |   |    |    |    |   |   |    |    |   |    |    |    |   |     |    |    |   |      |    |    |   |             |  |  |  |  |    |               |  |  |  |  |  |       |        |                     |       |       |       |   |                        |        |    |     |   |    |             |    |     |   |     |    |     |   |    |    |     |   |   |    |     |   |    |    |     |   |     |    |     |   |      |    |     |   |    |    |     |   |   |    |     |   |             |  |  |  |  |    |  |
| X             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                                                                                                                                                                                                                                                                                                                                        | 12    | 100   | 5     |  |  |       |        |                     |       |       |       |   |                        |        |    |    |   |    |             |    |    |   |     |    |    |   |    |    |    |   |   |    |    |   |    |    |    |   |     |    |    |   |      |    |    |   |             |  |  |  |  |    |               |  |  |  |  |  |       |        |                     |       |       |       |   |                        |        |    |     |   |    |             |    |     |   |     |    |     |   |    |    |     |   |   |    |     |   |    |    |     |   |     |    |     |   |      |    |     |   |    |    |     |   |   |    |     |   |             |  |  |  |  |    |  |
| Total Depth   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                                                                                                                                                                                                                                                                                                                                        |       |       | 50    |  |  |       |        |                     |       |       |       |   |                        |        |    |    |   |    |             |    |    |   |     |    |    |   |    |    |    |   |   |    |    |   |    |    |    |   |     |    |    |   |      |    |    |   |             |  |  |  |  |    |               |  |  |  |  |  |       |        |                     |       |       |       |   |                        |        |    |     |   |    |             |    |     |   |     |    |     |   |    |    |     |   |   |    |     |   |    |    |     |   |     |    |     |   |      |    |     |   |    |    |     |   |   |    |     |   |             |  |  |  |  |    |  |
| 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 for storage of rain water and may be converted in to dumping yards for solid waste by adopting suitable technologies.                                                                                                                                                                                                                                                                                    |
| g)  | Open cast mining                                                                                                                                                                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| i)  | Describe briefly giving salient features of the mode of working (Mechanized, Semi-Mechanized, manual)                                                                            | : It is a fresh quarry lease. The mining operation is opencast, semi-mechanized methods are adopted and on single shift basis only. Under the regulation 106 of the Metalliferous Mines Regulations, 1961 in all opencast workings in hard rock, the benches and sides should be properly benched and sloped. The bench height should not exceed 6m and the bench width should not less than the bench height. The slope of the benches should not exceed 45° from horizontal. |
| ii) | Describe briefly the layout of mine workings, the layout of faces and sites for disposal of overburden/waste. A reference to the plans enclosed under 4(b) and 4(d) will suffice | The rough stone is proposed to quarry at 5m bench height & width conventional opencast semi mechanized quarrying operation using shot hole drilling with the help of tractor mounted compressor attached with jack hammers, smooth blasting and waste and are removal using Hydraulic excavator and loaded directly to the tippers and transported to the needy customer.<br>Bench height = 5mts.<br>Bench width = 5mts.                                                       |
|     | a. Details of Topsoil/ Overburden                                                                                                                                                | No separate of topsoil will be removed.                                                                                                                                                                                                                                                                                                                                                                                                                                        |
|     | b. Rough Stone waste and side burden waste:-                                                                                                                                     | The recovery of rough stone in this quarry is                                                                                                                                                                                                                                                                                                                                                                                                                                  |

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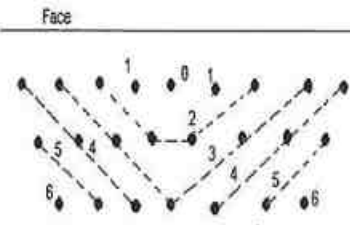
|                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | 100%. There is no rough stone waste or side burden will be removed.                                                                    |                 |                  |                 |      |              |      |                     |    |                       |           |        |        |    |            |   |     |     |    |        |    |  |
|---------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------|-----------------|------------------|-----------------|------|--------------|------|---------------------|----|-----------------------|-----------|--------|--------|----|------------|---|-----|-----|----|--------|----|--|
| H                   | Underground Mining                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | Not applicable                                                                                                                         |                 |                  |                 |      |              |      |                     |    |                       |           |        |        |    |            |   |     |     |    |        |    |  |
| i)                  | <b>Extent of mechanization:</b><br>Describe briefly including the calculation for adequacy and type of machinery and equipment proposed to be used in different mining operations.                                                                                                                                                                                                                                                                                                        |                                                                                                                                        |                 |                  |                 |      |              |      |                     |    |                       |           |        |        |    |            |   |     |     |    |        |    |  |
|                     | <b>(1) Drilling Machines:</b><br>Drilling of shot holes will be carried out using tractor mounted compressor and jack hammer. Details of drilling equipment's are given below.                                                                                                                                                                                                                                                                                                            |                                                                                                                                        |                 |                  |                 |      |              |      |                     |    |                       |           |        |        |    |            |   |     |     |    |        |    |  |
|                     | <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th>Type</th> <th>Nos</th> <th>Dia of hole (mm)</th> <th>Size / Capacity</th> <th>Make</th> <th>Motive power</th> <th>H.P.</th> </tr> </thead> <tbody> <tr> <td>Jack Hammer</td> <td>2</td> <td>32 mm</td> <td>Hand held</td> <td>--</td> <td>Diesel</td> <td>--</td> </tr> <tr> <td>Compressor</td> <td>2</td> <td>---</td> <td>Air</td> <td>--</td> <td>Diesel</td> <td>--</td> </tr> </tbody> </table> | Type                                                                                                                                   | Nos             | Dia of hole (mm) | Size / Capacity | Make | Motive power | H.P. | Jack Hammer         | 2  | 32 mm                 | Hand held | --     | Diesel | -- | Compressor | 2 | --- | Air | -- | Diesel | -- |  |
| Type                | Nos                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | Dia of hole (mm)                                                                                                                       | Size / Capacity | Make             | Motive power    | H.P. |              |      |                     |    |                       |           |        |        |    |            |   |     |     |    |        |    |  |
| Jack Hammer         | 2                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | 32 mm                                                                                                                                  | Hand held       | --               | Diesel          | --   |              |      |                     |    |                       |           |        |        |    |            |   |     |     |    |        |    |  |
| Compressor          | 2                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | ---                                                                                                                                    | Air             | --               | Diesel          | --   |              |      |                     |    |                       |           |        |        |    |            |   |     |     |    |        |    |  |
|                     | <b>(2) Loading Equipment:</b> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th>Type</th> <th>Nos</th> <th>Size / Capacity</th> <th>Make</th> <th>Motive power</th> <th>H.P.</th> </tr> </thead> <tbody> <tr> <td>Hydraulic Excavator</td> <td>2</td> <td>2.9-4.5m<sup>3</sup></td> <td>--</td> <td>Diesel</td> <td>--</td> </tr> </tbody> </table>                                                                                                     |                                                                                                                                        | Type            | Nos              | Size / Capacity | Make | Motive power | H.P. | Hydraulic Excavator | 2  | 2.9-4.5m <sup>3</sup> | --        | Diesel | --     |    |            |   |     |     |    |        |    |  |
| Type                | Nos                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | Size / Capacity                                                                                                                        | Make            | Motive power     | H.P.            |      |              |      |                     |    |                       |           |        |        |    |            |   |     |     |    |        |    |  |
| Hydraulic Excavator | 2                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | 2.9-4.5m <sup>3</sup>                                                                                                                  | --              | Diesel           | --              |      |              |      |                     |    |                       |           |        |        |    |            |   |     |     |    |        |    |  |
|                     | <b>(3) Haulage and Transport Equipment</b><br>(a) Haulage within the mining leasehold: <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th>Type</th> <th>Nos</th> <th>Size / Capacity</th> <th>Make</th> <th>Motive power</th> <th>H.P.</th> </tr> </thead> <tbody> <tr> <td>Tipper</td> <td>8</td> <td>--</td> <td>--</td> <td>Diesel</td> <td>--</td> </tr> </tbody> </table>                                                                           |                                                                                                                                        | Type            | Nos              | Size / Capacity | Make | Motive power | H.P. | Tipper              | 8  | --                    | --        | Diesel | --     |    |            |   |     |     |    |        |    |  |
| Type                | Nos                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | Size / Capacity                                                                                                                        | Make            | Motive power     | H.P.            |      |              |      |                     |    |                       |           |        |        |    |            |   |     |     |    |        |    |  |
| Tipper              | 8                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | --                                                                                                                                     | --              | Diesel           | --              |      |              |      |                     |    |                       |           |        |        |    |            |   |     |     |    |        |    |  |
|                     | <b>Whether the dumpers are fitted with exhaust conditioner should be indicated:</b><br>The dumpers not used in this quarry area, hence it's a small "B" category mine.                                                                                                                                                                                                                                                                                                                    |                                                                                                                                        |                 |                  |                 |      |              |      |                     |    |                       |           |        |        |    |            |   |     |     |    |        |    |  |
| b)                  | Transport from mine head to the destination                                                                                                                                                                                                                                                                                                                                                                                                                                               | Tipper will be used for transport rough stone from the mine head to needy customer.                                                    |                 |                  |                 |      |              |      |                     |    |                       |           |        |        |    |            |   |     |     |    |        |    |  |
| c)                  | Describe briefly the transport system (please specify)                                                                                                                                                                                                                                                                                                                                                                                                                                    | Hydraulic excavator and tippers utilized for internal transport sizeable rough stone lumps and deliver to the customer's area.         |                 |                  |                 |      |              |      |                     |    |                       |           |        |        |    |            |   |     |     |    |        |    |  |
|                     | i) Ore transported by: own trucks / hired trucks                                                                                                                                                                                                                                                                                                                                                                                                                                          | Hired trucks for initially production purposes.                                                                                        |                 |                  |                 |      |              |      |                     |    |                       |           |        |        |    |            |   |     |     |    |        |    |  |
|                     | ii) Main destination to which ore is transported (giving to and from distance)                                                                                                                                                                                                                                                                                                                                                                                                            | The excavated stone materials road metal will be supplied to the consumers like road laying, earth filling, building construction, etc |                 |                  |                 |      |              |      |                     |    |                       |           |        |        |    |            |   |     |     |    |        |    |  |
| a)                  | <b>Details of hauling / transport equipment:</b> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th>Type</th> <th>Nos</th> <th>Size / Capacity</th> <th>Make</th> <th>Motive power</th> <th>H.P.</th> </tr> </thead> <tbody> <tr> <td>--</td> <td>--</td> <td>--</td> <td>--</td> <td>--</td> <td>--</td> </tr> </tbody> </table>                                                                                                                        |                                                                                                                                        | Type            | Nos              | Size / Capacity | Make | Motive power | H.P. | --                  | -- | --                    | --        | --     | --     |    |            |   |     |     |    |        |    |  |
| Type                | Nos                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | Size / Capacity                                                                                                                        | Make            | Motive power     | H.P.            |      |              |      |                     |    |                       |           |        |        |    |            |   |     |     |    |        |    |  |
| --                  | --                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | --                                                                                                                                     | --              | --               | --              |      |              |      |                     |    |                       |           |        |        |    |            |   |     |     |    |        |    |  |



| 4)                                              | <b>(4). Miscellaneous:</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | Describe briefly any allied operations and machineries related to the mining of the deposit not covered earlier.                                                      |  |              |  |                              |    |                 |     |                  |      |               |     |                        |      |          |     |                      |     |                        |     |                             |       |                              |     |                        |      |                                     |      |                                                 |     |                           |    |                           |   |                   |           |                              |      |                                    |      |                 |      |                    |        |                             |    |                   |       |
|-------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|--------------|--|------------------------------|----|-----------------|-----|------------------|------|---------------|-----|------------------------|------|----------|-----|----------------------|-----|------------------------|-----|-----------------------------|-------|------------------------------|-----|------------------------|------|-------------------------------------|------|-------------------------------------------------|-----|---------------------------|----|---------------------------|---|-------------------|-----------|------------------------------|------|------------------------------------|------|-----------------|------|--------------------|--------|-----------------------------|----|-------------------|-------|
|                                                 | (A) Operations                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | The mining operation is open-cast, 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. |  |              |  |                              |    |                 |     |                  |      |               |     |                        |      |          |     |                      |     |                        |     |                             |       |                              |     |                        |      |                                     |      |                                                 |     |                           |    |                           |   |                   |           |                              |      |                                    |      |                 |      |                    |        |                             |    |                   |       |
| 5.                                              | <b>BLASTING:</b><br><b>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.</b><br><b>Blasting pattern:</b><br><p>The quarrying operation is proposed to carried by open cast mining in conjunction with conventional method using jack hammer drilling and blasting for shattering effect and loosen the rough stone.</p> <p>Rough stone production for 5 years = <b>381425m<sup>3</sup></b> or <b>1048919Ts</b></p> <table border="1" style="width: 100%; border-collapse: collapse; margin-top: 10px;"> <thead> <tr> <th colspan="2" style="text-align: center;">BLAST DESIGN</th> </tr> </thead> <tbody> <tr><td>Blasthole Diameter (D) in mm</td><td style="text-align: center;">32</td></tr> <tr><td>Burden (B) in m</td><td style="text-align: center;">1.2</td></tr> <tr><td>Spacing (S) in m</td><td style="text-align: center;">1.38</td></tr> <tr><td>Subdrill in m</td><td style="text-align: center;">0.5</td></tr> <tr><td>Charge length (C) in m</td><td style="text-align: center;">0.70</td></tr> <tr><td>Stemming</td><td style="text-align: center;">0.5</td></tr> <tr><td>Hole Length (L) in m</td><td style="text-align: center;">1.2</td></tr> <tr><td>Bench Height (BH) in m</td><td style="text-align: center;">2.5</td></tr> <tr><td>Mass of explosive/hole in g</td><td style="text-align: center;">437.5</td></tr> <tr><td>Stemming material size in mm</td><td style="text-align: center;">3.2</td></tr> <tr><td>Burden stiffness ratio</td><td style="text-align: center;">2.08</td></tr> <tr><td>Blast volume/hole in m<sup>3</sup></td><td style="text-align: center;">4.14</td></tr> <tr><td>Production of rough stone/day in m<sup>3</sup></td><td style="text-align: center;">272</td></tr> <tr><td>Number of blast holes/day</td><td style="text-align: center;">60</td></tr> <tr><td>Number of blast round/day</td><td style="text-align: center;">2</td></tr> <tr><td>Blasthole pattern</td><td style="text-align: center;">Staggered</td></tr> <tr><td>Mass of explosive /day in kg</td><td style="text-align: center;">26.0</td></tr> <tr><td>Powder factor in kg/m<sup>3</sup></td><td style="text-align: center;">0.11</td></tr> <tr><td>Loading density</td><td style="text-align: center;">0.63</td></tr> <tr><td>Type of explosives</td><td style="text-align: center;">Slurry</td></tr> <tr><td>Diameter of packaging in mm</td><td style="text-align: center;">25</td></tr> <tr><td>Initiation system</td><td style="text-align: center;">NONEL</td></tr> </tbody> </table> <p style="margin-top: 5px;">Note: If &gt;2kg of explosives per day use for blasting if proponent get the</p> |                                                                                                                                                                       |  | BLAST DESIGN |  | Blasthole Diameter (D) in mm | 32 | Burden (B) in m | 1.2 | Spacing (S) in m | 1.38 | Subdrill in m | 0.5 | Charge length (C) in m | 0.70 | Stemming | 0.5 | Hole Length (L) in m | 1.2 | Bench Height (BH) in m | 2.5 | Mass of explosive/hole in g | 437.5 | Stemming material size in mm | 3.2 | Burden stiffness ratio | 2.08 | Blast volume/hole in m <sup>3</sup> | 4.14 | Production of rough stone/day in m <sup>3</sup> | 272 | Number of blast holes/day | 60 | Number of blast round/day | 2 | Blasthole pattern | Staggered | Mass of explosive /day in kg | 26.0 | Powder factor in kg/m <sup>3</sup> | 0.11 | Loading density | 0.63 | Type of explosives | Slurry | Diameter of packaging in mm | 25 | Initiation system | NONEL |
| BLAST DESIGN                                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                                                                                                                                                                       |  |              |  |                              |    |                 |     |                  |      |               |     |                        |      |          |     |                      |     |                        |     |                             |       |                              |     |                        |      |                                     |      |                                                 |     |                           |    |                           |   |                   |           |                              |      |                                    |      |                 |      |                    |        |                             |    |                   |       |
| Blasthole Diameter (D) in mm                    | 32                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                                                                                                                                                                       |  |              |  |                              |    |                 |     |                  |      |               |     |                        |      |          |     |                      |     |                        |     |                             |       |                              |     |                        |      |                                     |      |                                                 |     |                           |    |                           |   |                   |           |                              |      |                                    |      |                 |      |                    |        |                             |    |                   |       |
| Burden (B) in m                                 | 1.2                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                                                                                                                                                                       |  |              |  |                              |    |                 |     |                  |      |               |     |                        |      |          |     |                      |     |                        |     |                             |       |                              |     |                        |      |                                     |      |                                                 |     |                           |    |                           |   |                   |           |                              |      |                                    |      |                 |      |                    |        |                             |    |                   |       |
| Spacing (S) in m                                | 1.38                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                                                                                                                                       |  |              |  |                              |    |                 |     |                  |      |               |     |                        |      |          |     |                      |     |                        |     |                             |       |                              |     |                        |      |                                     |      |                                                 |     |                           |    |                           |   |                   |           |                              |      |                                    |      |                 |      |                    |        |                             |    |                   |       |
| Subdrill in m                                   | 0.5                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                                                                                                                                                                       |  |              |  |                              |    |                 |     |                  |      |               |     |                        |      |          |     |                      |     |                        |     |                             |       |                              |     |                        |      |                                     |      |                                                 |     |                           |    |                           |   |                   |           |                              |      |                                    |      |                 |      |                    |        |                             |    |                   |       |
| Charge length (C) in m                          | 0.70                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                                                                                                                                       |  |              |  |                              |    |                 |     |                  |      |               |     |                        |      |          |     |                      |     |                        |     |                             |       |                              |     |                        |      |                                     |      |                                                 |     |                           |    |                           |   |                   |           |                              |      |                                    |      |                 |      |                    |        |                             |    |                   |       |
| Stemming                                        | 0.5                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                                                                                                                                                                       |  |              |  |                              |    |                 |     |                  |      |               |     |                        |      |          |     |                      |     |                        |     |                             |       |                              |     |                        |      |                                     |      |                                                 |     |                           |    |                           |   |                   |           |                              |      |                                    |      |                 |      |                    |        |                             |    |                   |       |
| Hole Length (L) in m                            | 1.2                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                                                                                                                                                                       |  |              |  |                              |    |                 |     |                  |      |               |     |                        |      |          |     |                      |     |                        |     |                             |       |                              |     |                        |      |                                     |      |                                                 |     |                           |    |                           |   |                   |           |                              |      |                                    |      |                 |      |                    |        |                             |    |                   |       |
| Bench Height (BH) in m                          | 2.5                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                                                                                                                                                                       |  |              |  |                              |    |                 |     |                  |      |               |     |                        |      |          |     |                      |     |                        |     |                             |       |                              |     |                        |      |                                     |      |                                                 |     |                           |    |                           |   |                   |           |                              |      |                                    |      |                 |      |                    |        |                             |    |                   |       |
| Mass of explosive/hole in g                     | 437.5                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                                                                                                                                                       |  |              |  |                              |    |                 |     |                  |      |               |     |                        |      |          |     |                      |     |                        |     |                             |       |                              |     |                        |      |                                     |      |                                                 |     |                           |    |                           |   |                   |           |                              |      |                                    |      |                 |      |                    |        |                             |    |                   |       |
| Stemming material size in mm                    | 3.2                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                                                                                                                                                                       |  |              |  |                              |    |                 |     |                  |      |               |     |                        |      |          |     |                      |     |                        |     |                             |       |                              |     |                        |      |                                     |      |                                                 |     |                           |    |                           |   |                   |           |                              |      |                                    |      |                 |      |                    |        |                             |    |                   |       |
| Burden stiffness ratio                          | 2.08                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                                                                                                                                       |  |              |  |                              |    |                 |     |                  |      |               |     |                        |      |          |     |                      |     |                        |     |                             |       |                              |     |                        |      |                                     |      |                                                 |     |                           |    |                           |   |                   |           |                              |      |                                    |      |                 |      |                    |        |                             |    |                   |       |
| Blast volume/hole in m <sup>3</sup>             | 4.14                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                                                                                                                                       |  |              |  |                              |    |                 |     |                  |      |               |     |                        |      |          |     |                      |     |                        |     |                             |       |                              |     |                        |      |                                     |      |                                                 |     |                           |    |                           |   |                   |           |                              |      |                                    |      |                 |      |                    |        |                             |    |                   |       |
| Production of rough stone/day in m <sup>3</sup> | 272                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                                                                                                                                                                       |  |              |  |                              |    |                 |     |                  |      |               |     |                        |      |          |     |                      |     |                        |     |                             |       |                              |     |                        |      |                                     |      |                                                 |     |                           |    |                           |   |                   |           |                              |      |                                    |      |                 |      |                    |        |                             |    |                   |       |
| Number of blast holes/day                       | 60                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                                                                                                                                                                       |  |              |  |                              |    |                 |     |                  |      |               |     |                        |      |          |     |                      |     |                        |     |                             |       |                              |     |                        |      |                                     |      |                                                 |     |                           |    |                           |   |                   |           |                              |      |                                    |      |                 |      |                    |        |                             |    |                   |       |
| Number of blast round/day                       | 2                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                                                                                                                                                                       |  |              |  |                              |    |                 |     |                  |      |               |     |                        |      |          |     |                      |     |                        |     |                             |       |                              |     |                        |      |                                     |      |                                                 |     |                           |    |                           |   |                   |           |                              |      |                                    |      |                 |      |                    |        |                             |    |                   |       |
| Blasthole pattern                               | Staggered                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                                                                                                                                                                       |  |              |  |                              |    |                 |     |                  |      |               |     |                        |      |          |     |                      |     |                        |     |                             |       |                              |     |                        |      |                                     |      |                                                 |     |                           |    |                           |   |                   |           |                              |      |                                    |      |                 |      |                    |        |                             |    |                   |       |
| Mass of explosive /day in kg                    | 26.0                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                                                                                                                                       |  |              |  |                              |    |                 |     |                  |      |               |     |                        |      |          |     |                      |     |                        |     |                             |       |                              |     |                        |      |                                     |      |                                                 |     |                           |    |                           |   |                   |           |                              |      |                                    |      |                 |      |                    |        |                             |    |                   |       |
| Powder factor in kg/m <sup>3</sup>              | 0.11                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                                                                                                                                       |  |              |  |                              |    |                 |     |                  |      |               |     |                        |      |          |     |                      |     |                        |     |                             |       |                              |     |                        |      |                                     |      |                                                 |     |                           |    |                           |   |                   |           |                              |      |                                    |      |                 |      |                    |        |                             |    |                   |       |
| Loading density                                 | 0.63                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                                                                                                                                       |  |              |  |                              |    |                 |     |                  |      |               |     |                        |      |          |     |                      |     |                        |     |                             |       |                              |     |                        |      |                                     |      |                                                 |     |                           |    |                           |   |                   |           |                              |      |                                    |      |                 |      |                    |        |                             |    |                   |       |
| Type of explosives                              | Slurry                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                                                                                                                                                                       |  |              |  |                              |    |                 |     |                  |      |               |     |                        |      |          |     |                      |     |                        |     |                             |       |                              |     |                        |      |                                     |      |                                                 |     |                           |    |                           |   |                   |           |                              |      |                                    |      |                 |      |                    |        |                             |    |                   |       |
| Diameter of packaging in mm                     | 25                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                                                                                                                                                                       |  |              |  |                              |    |                 |     |                  |      |               |     |                        |      |          |     |                      |     |                        |     |                             |       |                              |     |                        |      |                                     |      |                                                 |     |                           |    |                           |   |                   |           |                              |      |                                    |      |                 |      |                    |        |                             |    |                   |       |
| Initiation system                               | NONEL                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                                                                                                                                                       |  |              |  |                              |    |                 |     |                  |      |               |     |                        |      |          |     |                      |     |                        |     |                             |       |                              |     |                        |      |                                     |      |                                                 |     |                           |    |                           |   |                   |           |                              |      |                                    |      |                 |      |                    |        |                             |    |                   |       |



permission from the DGMS



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 jack hammer 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:**

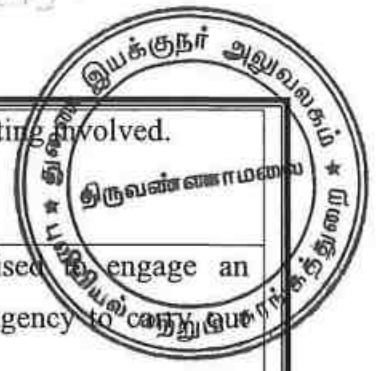
Delay blasting permits to divide the shot to smaller charges, which are detonated in a predetermined millisecond sequence at specific time intervals. The major advantages of delay blasting are:

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

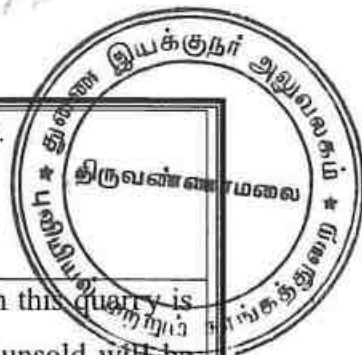
Blasting program for the production per day

|                           |   |                          |
|---------------------------|---|--------------------------|
| No of holes               | : | 60 holes                 |
| Yield                     | : | 272m <sup>3</sup>        |
| Total explosive required  | : | 26.0kg-Slurry explosives |
| Charge per hole           | : | 0.5kg                    |
| Blasting at day time only | : | 12.0p.m-1.0p.m           |

|    |                                                                           |   |                                                            |
|----|---------------------------------------------------------------------------|---|------------------------------------------------------------|
| c) | Powder factor in ore and overburden / waste / development heading / stope | : | Powder factor is proposed as 0.11kg per hole of explosives |
|----|---------------------------------------------------------------------------|---|------------------------------------------------------------|



|     |                                                                                                                                                                                    |                                                                                                                                                                                                                                                                                                                                                                                       |
|-----|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| d)  | Whether secondary blasting is needed, if so describe it briefly                                                                                                                    | There is no secondary blasting involved.                                                                                                                                                                                                                                                                                                                                              |
| e)  | Storage of explosives (like capacity and type of explosive magazine)                                                                                                               | 1. The applicant is advised to engage an authorized explosive agency to carry out blasting.<br>2. First Aid Box will be keeping ready at all the time.<br>3. Necessary precautionary announcement will be carried out before the blasting operation.                                                                                                                                  |
| 6.  | <b>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 65m in summer and 60m in rainy season from the general ground level observed in the adjacent bore well.                                                                                                                                                                                                                                      |
| b)  | Workings expected to be _____ m. above / reach below water table by the year _____.                                                                                                | Proposed mining depth is 50m below ground level. Now, the present Mining lease shall 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 pumping arrangements and places where the mine water is finally proposed to be discharged                              | The ground water may not rise immediately in this type of mining. However, the rain water percolation and collection of water from the seepage shall be less than 300 L pm and it shall 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 it is not contaminated with any hazardous things. |
| 7.  | <b>STACKING OF MINERAL REJECTS AND DISPOSAL OF WASTE:</b>                                                                                                                          |                                                                                                                                                                                                                                                                                                                                                                                       |
| a). | Indicate briefly the nature and quantity of top soil, overburden / waste and mineral rejects likely to be generated during the years:<br>No other wastes are removed during years. |                                                                                                                                                                                                                                                                                                                                                                                       |



|     |                                                                                                                                                                                        |   |                                                                                                                                                                                                                                                      |
|-----|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| b). | Land chosen for disposal of waste with proposed justification                                                                                                                          | : | There is no waste are proposed.                                                                                                                                                                                                                      |
| c). | Attach a note indicating the manner of disposal and configuration, sequence of buildup of dumps along with the proposals for the stacking of sub-grade ore, to be indicated Year wise. | : | The recovery of rough stone in this quarry is 100%. If rough stone may be unsold will be keep within the lease boundary.                                                                                                                             |
| 8.  | <b>USE OF MINERAL:</b>                                                                                                                                                                 |   |                                                                                                                                                                                                                                                      |
| a). | Describe briefly the end-use of the mineral (sale to intermediary parties, captive consumption, export, industrial use)                                                                | : | The excavated stone materials will be supplied to the consumers like stone pillar, sized stone, etc. For instance, aggregates are mostly used for building, roads and footpaths., etc                                                                |
| b). | Indicate physical and chemical specifications stipulated by buyers                                                                                                                     | : | Basically, the materials produced at this quarry are rough stone (charnockite) and gravel the same are used for building materials and road metal. So, there is no chemical specifications are specified. Only physical specifications are involved. |
| c). | Give details in case blending of different grades of ores is being practiced or is to be practiced at the mine to meet specifications stipulated by buyers.                            | : | Not blending process is involved, after blasting the rough stone and gravel will be directly loaded to the needy customer.                                                                                                                           |
| 9.  | <b>OTHERS</b>                                                                                                                                                                          |   |                                                                                                                                                                                                                                                      |
|     | <b>Describe briefly the following</b><br>a) Site services                                                                                                                              | : | Infrastructure required for such mines like office, stores, canteen, first aid station, shelter latrine and bath rooms have been provided as per the Metalliferous Mines Regulations, 1961 as a welfare amenity for our quarry laborers.             |





b) Employment potential:

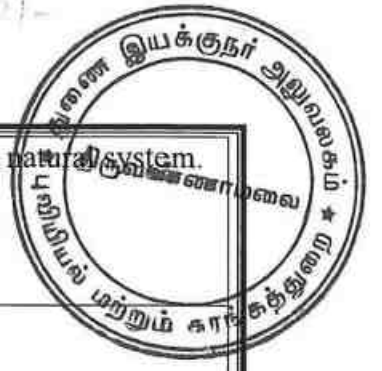
As per Mines safety under the provisions of Metalliferous Mines Rules, 1961 under the Mines Act, 1952, whenever the workers are employed more than 10, it is preferred to have a qualified Mining Mate to keep all the production workers directly under his control and supervision.

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

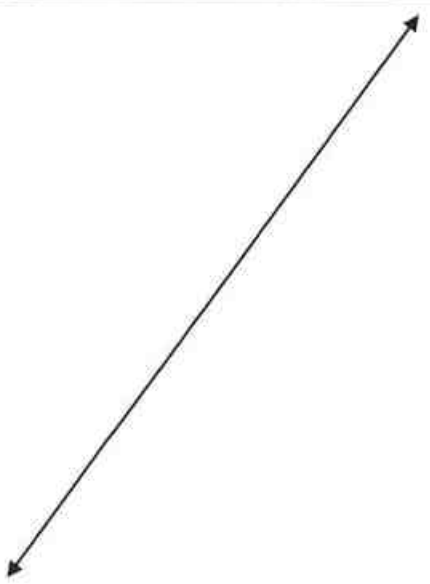
|         |                |                   |         |
|---------|----------------|-------------------|---------|
| 1.      | Highly Skilled | Mines Manager     | 1No.    |
|         |                | Mine Engineer     | 1No.    |
|         |                | Mine Geologist    | 1No     |
|         |                | Blaster           | 1No     |
| 2.      | Unskilled      | Musdoor / Labours | 18No's  |
| Total = |                |                   | 22 No's |

10 MINERAL PROCESSING/BENEFICIATIONS:

- (a) If processing / beneficiations of the ore or minerals mined is planned to be conducted on site or adjacent to the extraction area, briefly describe the nature of the processing /beneficiation. This should indicate size and grade of feed material and concentrate (finished marketable product), recovery rate. : Excavated rough stone minerals directly will be used by the applicant for required size ½, ¾ and 1½ inches Jelly which are mainly used in road and building construction purpose.  
The recovery of rough stone in this quarry is 100%.
- (b) Explain the disposal method for tailings or waste from the processing plant (quantity and quality of tailings proposed to be discharged, size and capacity of tailing pond, toxic effect of such tailings, if any, with process adopted to neutralize : No water shall 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 shall 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



|     |                                                                                                                                                   |   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
|-----|---------------------------------------------------------------------------------------------------------------------------------------------------|---|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|     | any such effect before their disposal and dealing of excess water from the tailing dam).                                                          |   | 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 of recycling. | : | Drinking is 0.2KLD, utilized water is 0.8KLD, Dust suppression is 1.2KLD and Green Belt is 1.3KLD. Minimum quantity of water 3.5KLD per day. It is proposed to make an authorized water vendors for drinking water, dust suppression. The workers utilized water will be used for green belt development. The sewage water to a tune of 0.9KLD generated from the mine office toilet and mine labour toilet will be diverted to the septic tank followed by soak pit. |



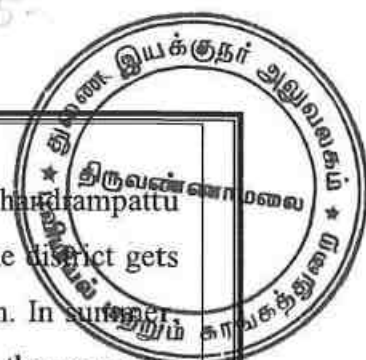


## PART – B

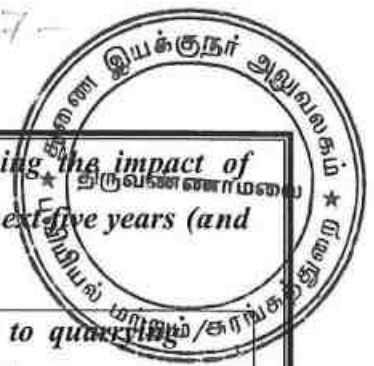
### 11.0 ENVIRONMENTAL MANAGEMENT PLAN:

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

| 11.1    | Fresh lease 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> <tr> <th>Sl. No.</th><th>Land Use</th><th>Present area (Hect.)</th></tr> <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>Roads</td><td>Nil</td></tr> <tr> <td>4</td><td>Unutilized</td><td>3.38.58</td></tr> <tr> <td>5</td><td>Green belt</td><td>Nil</td></tr> <tr> <td>6</td><td>Settling Tank &amp; Drainage</td><td>Nil</td></tr> <tr> <td></td><td><b>Grand Total</b></td><td><b>3.38.58</b></td></tr> </table> | Sl. No.                                                                                                                                                                                                                                                                                                                                                                                                                                                 | Land Use | Present area (Hect.) | 1. | Area under Mining | Nil | 2 | Infrastructure | Nil | 3 | Roads | Nil | 4 | Unutilized | 3.38.58 | 5 | Green belt | Nil | 6 | Settling Tank & Drainage | Nil |  | <b>Grand Total</b> | <b>3.38.58</b> |  |
| Sl. No. | Land Use                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | Present area (Hect.)                                                                                                                                                                                                                                                                                                                                                                                                                                    |          |                      |    |                   |     |   |                |     |   |       |     |   |            |         |   |            |     |   |                          |     |  |                    |                |  |
| 1.      | Area under Mining                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | Nil                                                                                                                                                                                                                                                                                                                                                                                                                                                     |          |                      |    |                   |     |   |                |     |   |       |     |   |            |         |   |            |     |   |                          |     |  |                    |                |  |
| 2       | Infrastructure                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | Nil                                                                                                                                                                                                                                                                                                                                                                                                                                                     |          |                      |    |                   |     |   |                |     |   |       |     |   |            |         |   |            |     |   |                          |     |  |                    |                |  |
| 3       | Roads                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | Nil                                                                                                                                                                                                                                                                                                                                                                                                                                                     |          |                      |    |                   |     |   |                |     |   |       |     |   |            |         |   |            |     |   |                          |     |  |                    |                |  |
| 4       | Unutilized                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | 3.38.58                                                                                                                                                                                                                                                                                                                                                                                                                                                 |          |                      |    |                   |     |   |                |     |   |       |     |   |            |         |   |            |     |   |                          |     |  |                    |                |  |
| 5       | Green belt                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | Nil                                                                                                                                                                                                                                                                                                                                                                                                                                                     |          |                      |    |                   |     |   |                |     |   |       |     |   |            |         |   |            |     |   |                          |     |  |                    |                |  |
| 6       | Settling Tank & Drainage                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | Nil                                                                                                                                                                                                                                                                                                                                                                                                                                                     |          |                      |    |                   |     |   |                |     |   |       |     |   |            |         |   |            |     |   |                          |     |  |                    |                |  |
|         | <b>Grand Total</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | <b>3.38.58</b>                                                                                                                                                                                                                                                                                                                                                                                                                                          |          |                      |    |                   |     |   |                |     |   |       |     |   |            |         |   |            |     |   |                          |     |  |                    |                |  |
| 11.2    | Water Regime                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | : Water table in this area is noticed at a depth of 65m in summer and 60m in rainy season from the general ground level and presently the quarrying of rough stone is ultimate up to a depth of 50m below ground level. Hence, it will not affect the ground water depletion of this area. It is proposed to make an authorized water vendors for drinking water, dust suppression. The workers utilized water will be used for green belt development. |          |                      |    |                   |     |   |                |     |   |       |     |   |            |         |   |            |     |   |                          |     |  |                    |                |  |
| 11.3    | Flora and Fauna                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | : There is no major flora observed in this area and except bushes, shrubs, 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 | <b>Climatic conditions:</b><br><br>This district has moderate climate. In Tiruvannamalai and Thandampattu taluks, the climate is cool in winter and hot during summer. The district gets rainfall during both north-east monsoon and southwest monsoon. In summer, from march to June, the wind is hot and uncomfortable. In the monsoon season, from July to November, the wind is mild and from December to February, the wind is cold. The hottest month in this district was April (36.3°C) and coldest month in this district was January (21.2°C).<br><br>The general climate is tropical. The district receives rainfall from Northeast and Southwest monsoons. The total rainfall during 2016-17 districts is 635.8mm. |                                                                                                                                                                                                                                                    |                 |            |           |                 |            |   |              |       |       |     |   |          |      |       |      |   |                |       |       |     |   |            |      |       |     |
|------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------|------------|-----------|-----------------|------------|---|--------------|-------|-------|-----|---|----------|------|-------|------|---|----------------|-------|-------|-----|---|------------|------|-------|-----|
| 11.6 | <b>Human Settlement:</b><br><br>The nearest villages are found in the buffer zone with population as per 2011 census.<br><table><tr><th>S.No</th><th>Village</th><th>Direction</th><th>Distance in Kms</th><th>Population</th></tr><tr><td>1</td><td>Poonathangal</td><td>North</td><td>1.1km</td><td>277</td></tr><tr><td>2</td><td>Suruttal</td><td>East</td><td>1.8km</td><td>1266</td></tr><tr><td>3</td><td>Bagavandapuram</td><td>South</td><td>1.0km</td><td>777</td></tr><tr><td>4</td><td>Valavandal</td><td>West</td><td>2.8km</td><td>444</td></tr></table>                                                                                                                                                         |                                                                                                                                                                                                                                                    | S.No            | Village    | Direction | Distance in Kms | Population | 1 | Poonathangal | North | 1.1km | 277 | 2 | Suruttal | East | 1.8km | 1266 | 3 | Bagavandapuram | South | 1.0km | 777 | 4 | Valavandal | West | 2.8km | 444 |
| S.No | Village                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | Direction                                                                                                                                                                                                                                          | Distance in Kms | Population |           |                 |            |   |              |       |       |     |   |          |      |       |      |   |                |       |       |     |   |            |      |       |     |
| 1    | Poonathangal                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | North                                                                                                                                                                                                                                              | 1.1km           | 277        |           |                 |            |   |              |       |       |     |   |          |      |       |      |   |                |       |       |     |   |            |      |       |     |
| 2    | Suruttal                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | East                                                                                                                                                                                                                                               | 1.8km           | 1266       |           |                 |            |   |              |       |       |     |   |          |      |       |      |   |                |       |       |     |   |            |      |       |     |
| 3    | Bagavandapuram                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | South                                                                                                                                                                                                                                              | 1.0km           | 777        |           |                 |            |   |              |       |       |     |   |          |      |       |      |   |                |       |       |     |   |            |      |       |     |
| 4    | Valavandal                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | West                                                                                                                                                                                                                                               | 2.8km           | 444        |           |                 |            |   |              |       |       |     |   |          |      |       |      |   |                |       |       |     |   |            |      |       |     |
| 11.7 | Public buildings, places of worship and monuments                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | : No infrastructure like residential building, are found within radius of 300m. The 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) **Land area indicating the area likely to be degraded due to quarrying, pitting, dumping, roads, workshop, processing plant, township etc:**

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

| Sl. No. | Land Use                 | Area in use during the quarrying period (Hect.) |
|---------|--------------------------|-------------------------------------------------|
| 1       | Area under Mining        | 1.95.5                                          |
| 2       | Infrastructure           | 0.02.0                                          |
| 3       | Roads                    | 0.03.0                                          |
| 4       | Green Belt               | 1.29.88                                         |
| 5       | Un-Utilized Area         | Nil                                             |
| 6       | Drainage & Settling Tank | 0.08.2                                          |
|         | <b>Grand Total</b>       | <b>3.38.58</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 six months around the quarry site.           |
| v).   | Vibration levels<br>(due to blasting) | No deep hole blasting envisaged. Small dia shot holes are used for breaking boulders. The maximum peak particles velocity shall 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 river or any odai track are found around 50m radius.                                                                                                                                                                                                 |



|        |                           |                                                                                                                             |
|--------|---------------------------|-----------------------------------------------------------------------------------------------------------------------------|
| vii).  | Socio-economics           | 1. To provide Employment opportunities to the nearby villagers.<br>2. For the cultural development of the nearby villagers. |
| viii). | Historical monuments etc. | There are no historical monuments, etc found around 300m 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).  | Yearwise proposal for reclamation of land affected by abandoned quarries and other mining activities during five years (and upto conceptual plan period for 'A' category mines) clarifying the extent of back filling and re-contouring and / or alternative use of unfilled / partially filled excavations / road sides / slopes and mine. In case abandoned quarries/ pits are proposed to be used as reservoir, their size, water holding capacity and proposal for utilization of such water be given.                                             | : | The present mining is proposed depth of 50m from below the ground level has been envisaged as workable depth for safe & economic mining during the lease period. The mined-out area will be fenced on top of working bench with S1 fencing. No immediate proposals for closure of pit as the rough stone persist still at deeper level. |
| iii). | <p><b><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></b></p> <p><b>Green Belt Development:</b></p> <p>Safety barrier, nearby school area and Nearest Panchayat approach 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> |   |                                                                                                                                                                                                                                                                                                                                         |



| Year   | Place                                 | Area in Sq.m | No.of Plants | Rate of survival | Rate                | Amount in Rs. |
|--------|---------------------------------------|--------------|--------------|------------------|---------------------|---------------|
| First  | Lease Boundary                        | 12988        | 1400         | 80%              | @100 Rs Per sapling | 1,40,000/-    |
| Second | Approach road and Nearby Village Road | --           | 300          | 80%              |                     | 30,000/-      |
| Third  | Schools                               | --           | 300          | 80%              |                     | 30,000/-      |
| Total  |                                       |              |              |                  |                     | 2,00,000/-    |

|        |                                                                                                                                                               |   |                                                                                                                                                                                                             |
|--------|---------------------------------------------------------------------------------------------------------------------------------------------------------------|---|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| iv).   | Stabilization and vegetation of dumps along with waste dump management Year wise for the five years (and upto conceptual plan period for 'A' category mines). | : | No waste or rejects shall be proposed.                                                                                                                                                                      |
| v).    | Measures to control erosion / sedimentation of water courses.                                                                                                 | : | Not applicable. There is no major dumps are stabilize 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.                                                                |
| viii). | Protective measures for ground vibrations / air blast caused by blasting,                                                                                     | : | It is a small "B" category open cast, semi mechanized mining and no heavy machinery shall 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 villagers 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 B category quarry





### 12.0 PROGRESSIVE QUARRY CLOSURE PLAN:

|      |                                                                                                            |   |                                                                                                                                                                                                                                                                                                                                            |
|------|------------------------------------------------------------------------------------------------------------|---|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 12.1 | Steps proposed for phased restoration, reclamation of already mined out area.                              | : | The Ultimate mining is proposed to an average depth of 50m below ground level. 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. The quarried pit will be fenced by Barbed wire fencing. Green belt development at the rate of 1400 trees will be proposed in the quarry area. No immediate proposals for closure of pit as the rough stone persist still at deeper level.                                                |
| 12.3 | Mitigation measures to be undertaken for safety and restoration/ reclamation of the already mined out area | : | The quarry lease is a fresh mining lease, no mitigation measures observed.                                                                                                                                                                                                                                                                 |
| 12.4 | Mine closure activity                                                                                      | : | The present mining plan is proposed to depth of 50m below ground level has been envisaged as workable depth for safe & economic mining during the lease period. The mined-out area will be fenced on top of open cast working with S1 fencing. No immediate proposals for closure of pit as the rough stone persist still at deeper level. |
| 12.5 | Safety and security                                                                                        | : | Safety measures implement to the prevent access to surface opening excavations will be taken as Metalliferous mine regulations, 1961, it is a small open cast mining method adopted. Safety provisions like helmet, goggles, safety shoes, Dust mask, Ear muffs etc have to be provided as per the circulars and amendments made for Mine  |

|      |                                                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
|------|------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|      |                                                                        | labours under the guidance being a mechanized operation                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| 12.6 | Disaster management and Risk Assessment                                | : Open cast mining method 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. 22 labors will be improved.                                                                                                                                                                                                                                                                                                                                                                                                                                                     |

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

|          |                                                   |                          |
|----------|---------------------------------------------------|--------------------------|
| <b>A</b> | <b>Fixed Asset Cost:</b>                          |                          |
|          | 1. Land Cost (Consent Land)                       | : Rs. 15,00,000/-        |
|          | 2. Labour Shed                                    | : Rs. 1,00,000/-         |
|          | 3. Sanitary Facility                              | : Rs. 1,00,000/-         |
|          | 4. Fencing                                        | : Rs. 4,00,000/-         |
|          | 5. Other expenses (Security guard, dust bin, etc) | : Rs. 4,00,000/-         |
|          | <b>Total</b>                                      | : <b>Rs. 25,00,000/-</b> |

|   |                                                                |   |                                   |
|---|----------------------------------------------------------------|---|-----------------------------------|
| B | <b>B. Machinery cost</b>                                       | : | <b>Rs. 20,00,000/-</b> (Hire Bas) |
| C | <b>Total Expenditure of EMP cost (for five years)</b>          |   |                                   |
|   | 1. Drinking Water Facility                                     | : | Rs. 1,00,000/-                    |
|   | 2. Sanitary facility & Maintenance                             | : | Rs. 2,00,000/-                    |
|   | 3. Permanent water sprinkler                                   | : | Rs. 1,50,000/-                    |
|   | 4. Afforestation and its maintenance                           | : | Rs. 2,00,000                      |
|   | 5. Safety Kits                                                 | : | Rs. 1,00,000/-                    |
|   | 6. Provision of tyre washing facility                          | : | Rs. 1,50,000/-                    |
|   | 7. Blasting materials with blast mat cost                      | : | Rs. 10,00,000/-                   |
|   | 8. Drainage & Settling Tank<br>(0.08.20Hect or 820 Sq.m x 400) |   | Rs. 3,28,000/-                    |
|   | 9. Environment monitoring                                      | : | Rs. 5,00,000/-                    |
|   | <b>Total</b>                                                   | : | <b>Rs. 27,28,000/-</b>            |
| D | <b>Total Project Cost (A+B+C)</b>                              | : | <b>Rs. 72,28,000/-</b>            |

### **13.0 FINANCIAL ASSURANCE:**

Not applicable, it is a small "B" 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**

- Care and precautionary measures will be taken for the safety of workers as per Rules and Acts.
- The applicant will endeavor every attempt to quarry the rough stone economically without any wastage and to improve the environment and ecology.
- The Mining Plan is prepared by incorporating the conditions stipulated in the precise area communication issued by The Deputy Director, Department of Geology and Mining, Tiruvannamalai vide letter **Roc.No.172/Mines/2025 Dated 04.04.2025.**
- Total proposed production rough stone is **381425m<sup>3</sup>** or **1048919Ts** and gravel is **89610m<sup>3</sup>** or **179220Ts** up to a depth of 50m below ground level for five years plan period.



**17.0 CSR Expenditure:**

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

Place: Dharmapuri, TN

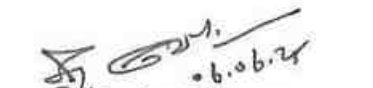
Date: 15/4/25



Signature of the Qualified Person

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

**This Mining Plan Is Approved  
Subject to the Conditions/Stipulation  
Indicated In The Mining Plan Approval  
Letter No. 172 /mines/2025 Dt: 06.6.2025  
Office Of The Deputy Director Of  
Geology And Mining, Tiruvannamalai.**



**Deputy Director,  
Geology and Mining,  
Tiruvannamalai.**



நக.எண்.172/கனிமம்/2025

துணை இயக்குநர் அலுவலகம்,  
மாவட்ட ஆட்சியர் அலுவலக  
வளாகம், திருவண்ணாமலை  
நாள்.04.04.2025

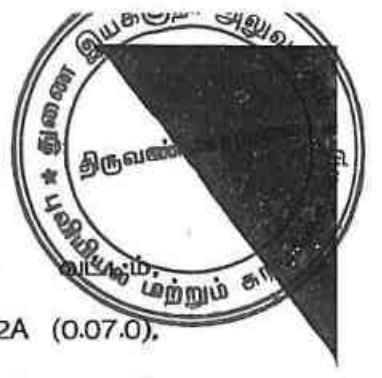
குறிப்பாணை

பொருள்: கனிமங்களும் சுரங்கங்களும் - சிறுகனிமம் - சாதாரண கற்கள் - திருவண்ணாமலை மாவட்டம் - வெம்பாக்கம் வட்டம் - குண்டியாந்தண்டலம் கிராம புல எண்கள். 162/1, 162/2A மற்றும் பலவற்றின் மொத்தப்பரப்பு 2.14.00 ஹெக்டேர் - பூனைத்தாங்கல் கிராம புல எண்கள். 117/12A2 மற்றும் பலவற்றில் மொத்தப்பரப்பு 1.24.58 ஹெக்டேர் ஆக மொத்தம் 3.38.58 ஹெக்டேர் பரப்பில் - சாதாரண கற்கள் மற்றும் கிராமவல் மண் வெட்டியெடுக்க ஸ்ரீ கன்னியம்மாள் புனா மெட்டல்ஸ் உரிமையாளர் திரு. க.குமார் என்பவர் 5 ஆண்டுகளுக்கு அனுமதிக்கோரி 1959ம் ஆண்டு தமிழ்நாடு சிறுகனிம சலுகை விதிகள் விதி எண்.19-ன் கீழ் விண்ணப்பம் செய்தது - அறிக்கைகள் வரப்பெற்றது - புலத்தணிக்கை செய்யப்பட்டது - தகுதியான நிலப்பரப்பாக கருதி ஏற்பளிக்கப்பட்ட சுரங்கதிட்டம் மற்றும் சுற்றுச்சூழல் தாக்க மதிப்பீட்டு ஆணைய தடையின்மை சான்று பெற்று சமர்ப்பிக்க கோருதல் தொடர்பாக.

- பார்வை: 1. ஸ்ரீ கன்னியம்மாள் புனா மெட்டல்ஸ் உரிமையாளர் திரு. க.குமார் என்பவரின் விண்ணப்பம் நாள். 05.03.2025.
2. இவ்வலுவலக கடிதம் இதே எண். நாள். 05.03.2025.
3. வட்டாட்சியர், வெம்பாக்கம் அவர்களின் நக.ஆ1/471/2025, நாள்.06.03.2025.
4. வருவாய் கோட்ட அலுவலர் (சு.பொ.) செய்யார் அவர்களின் நக.அ5/1268/2025, நாள். 06.03.2025.
5. உதவி புவியியலாளர், புவியியல் மற்றும் சுரங்கத்துறை அவர்களின் புலத்தணிக்கை நாள். 13.03.2025.
6. மற்றும் உரிய ஆவணங்கள்

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பார்வையில் காணும் கடிதங்களின் மீது கனிவான கவனம்  
வேண்டப்படுகிறது.



2) திருவண்ணாமலை மாவட்டம், வெம்பாக்கம் வட்டம் மற்றும் குண்டியாந்தண்டலம் கிராம புல எண்கள்: 162/1 (0.11.0), 162/2A (0.07.0), 162/2B (0.02.50), 162/6 (0.08.0), 162/3 (0.16.0), 162/4 (0.20.0), 162/5A (0.10.50), 162/5B (0.07.0), 162/7 (0.11.5), 162/8 (0.22.0), 162/10A1 (0.49.0), 162/10A3A (0.25.5), 162/10A3B (0.03.0) மற்றும் 162/10A2 (0.21.0) மொத்தம் 2.14.0 ஹெக்டேர் மற்றும் பூனைத்தாங்கல் கிராம புல எண்கள்: 117/12A2 (0.42.0), 144/1A (0.42.08) மற்றும் 144/2 (0.40.50) மொத்தம் 1.24.58 ஹெக்டேர் ஆக மொத்தம் 3.38.58 ஹெக்டேரில் சாதாரண கற்கள் / கிராவல் மண் குவாரி செய்ய 5 ஆண்டுகளுக்கு குத்தகை உரிமம் வழங்கக்கோரி ஸ்ரீ கன்னியம்மாள் புளூ மெட்டல்ஸ் உரிமையாளர் திரு.க.குமார் என்பவர் உரிய ஆவணங்களுடன் 05.03.2025 அன்று விண்ணப்பம் அளித்துள்ளார்.

3. மேற்கண்ட விண்ணப்பம் தொடர்பாக வட்டாட்சியர் மற்றும் வருவாய் கோட்ட அலுவலர் (சு.பொ), செய்யார் மற்றும் உதவி புவியியலாளர் (கனிமம்) திருவண்ணாமலை ஆகியோர் புலத்தணிக்கை மேற்கொண்டு திருவண்ணாமலை மாவட்டம், வெம்பாக்கம் வட்டம், குண்டியாந்தண்டலம் கிராம புல எண்கள்: 162/1 (0.11.0), 162/2A (0.07.0), 162/2B (0.02.50), 162/6 (0.08.0), 162/3 (0.16.0), 162/4 (0.20.0), 162/5A (0.10.50), 162/5B (0.07.0), 162/7 (0.11.5), 162/8 (0.22.0), 162/10A1 (0.49.0), 162/10A3A (0.25.5), 162/10A3B (0.03.0) மற்றும் 162/10A2 (0.21.0) மொத்தம் 2.14.0 ஹெக்டேர் மற்றும் பூனைத்தாங்கல் கிராம புல எண்கள்: 117/12A2 (0.42.0), 144/1A (0.42.08) மற்றும் 144/2 (0.40.50) மொத்தம் 1.24.58 ஹெக்டேர் ஆக மொத்தம் 3.38.58 ஹெக்டேரில் மட்டும் ஸ்ரீ கன்னியம்மாள் புளூ மெட்டல்ஸ் உரிமையாளர் திரு.க.குமார் என்பவருக்கு கிராவல் மண் மற்றும் சாதாரண கற்குவாரி உரிமம் வழங்க ஏற்கனவே குவாரி பணி செய்யாத புலம் என்பதால் 5 ஆண்டு காலத்திற்கு கீழ்க்கண்ட நிபந்தனைகளுக்கு உட்பட்டு அனுமதி வழங்கலாம் என பரிந்துரை செய்துள்ளனர்.



### நிபந்தனைகள்

- 1959-ம் வருடத்திய தமிழ்நாடு சிறு கனிம சலுகை விதிகள், அட்டவணை II-ல் கண்டுள்ளபடி குவாரி செய்யப்படும் கனிமங்களுக்கு சீனியரேஜ் தொகை அவ்வப்போது செலுத்தி கனிமம் கொண்டு செல்லப்பட வேண்டும்.
- புல எண் 144/1A, 144/2-க்கு வடக்காகவும் புல எண் 162/1A, 162/2A மற்றும் 162/3-க்கு மேற்காகவும், அமைந்துள்ள பூனைத்தாங்கள் கிராம அரசு நீர் புல எண்கள் 142 மற்றும் 143-க்கு 50மீ. பாதுகாப்பு இடைவெளி விட வேண்டும்.
- அருகில் உள்ள பட்டா நிலங்களுக்கு 7.5மீ. மற்றும் அரசு நிலங்களுக்கு 10 மீ. பாதுகாப்பு இடைவெளியும் விட வேண்டும்.
- அனுபவம் வாய்ந்த வெடிபொருள் பயன்படுத்துவோர் மூலம் குறைந்த அளவு சக்தி கொண்ட வெடிபொருட்களை பயன்படுத்தி அருகிலுள்ள பட்டாதாரர்களுக்கு எவ்வித இடையூறுமின்றி / அருகிலுள்ள பட்டா மற்றும் அரசு புலங்களில் எவ்வித ஆக்கிரமிப்பும் இன்றி குவாரிப் பணி மேற்கொள்ள வேண்டும்.
- விதிகளின்படி ஏற்பளிக்கப்பட்ட சுரங்கத்திட்டத்தினை உரிய காலத்திற்குள் சமர்ப்பிக்க வேண்டும்.
- குவாரி உரிமம் வழங்க உள்ள பகுதிக்கு சுற்றுச்சூழல் தாக்க மதிப்பீட்டு ஆணையத்தின் தடையின்மை சான்று பெற்று சமர்ப்பிக்கும் பட்சத்தில் மட்டுமே குவாரி உரிமம் வழங்கப்படும்.

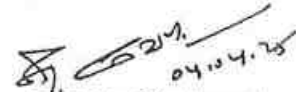
5. இயக்குநர், புவியியல் மற்றும் சுரங்கத்துறை, சென்னை அவர்களின் 10.08.2020 நாளிட்ட கடிதத்துடன் இணைத்து வரப்பெற்ற அரசாணை எண்.169 தொழில் துறை (எம்.எம்.சி-1) நாள் 04.08.2020-ன்படி பட்டா புலங்களில் கிராவல், சாதாரண வகை கற்கள் ஆகிய சிறுகனிம உரிமம் வழங்கும் நேர்வுகளில் நடவடிக்கை எடுக்க விதி 19 மற்றும் 33-ல் மாவட்ட ஆட்சியருக்கு வழங்கப்பட்ட அதிகாரம் தற்போது சம்மந்தப்பட்ட உதவி/துணை இயக்குநர் அவர்களுக்கு மாற்றி வழங்க உத்திரவிடப்பட்டுள்ளது.

6. எனவே, வட்டாட்சியர் மற்றும் வருவாய் கோட்ட அலுவலர் (சு.பொ), செய்யார் மற்றும் உதவி புவியியலாளர் (கனிமம்) திருவண்ணாமலை ஆகியோரின் பரிந்துரை, நிபந்தனைகள் மற்றும் மனுதாரரின் கோரிக்கையின் அடிப்படையில் திருவண்ணாமலை மாவட்டம், வெம்பாக்கம் வட்டம், குண்டியாந்தண்டலம் கிராம புல எண்கள்.162/1 (0.11.0), 162/2A (0.07.0), 162/2B (0.02.50), 162/6 (0.08.0), 162/3 (0.16.0), 162/4 (0.20.0), 162/5A



(0.10.50), 162/5B (0.07.0), 162/7 (0.11.5), 162/8 (0.22.0), 162/10A1 (0.22.0), 162/10A3A (0.25.5), 162/10A3B (0.03.0) மற்றும் 162/10A2 (0.21.0) மொத்தம் 2.14.0 ஹெக்டேர் மற்றும் பூனைத்தாங்கல் கிராம புல எண்கள். 117/12A2 (0.42.0), 144/1A (0.42.08) மற்றும் 144/2 (0.40.50) மொத்தம் 1.24.58 ஹெக்டேர் ஆக மொத்தம் 3.38.58 ஹெக்டேரில் 1959-ம் வருட தமிழ்நாடு சிறுகனிம விதிகள், விதி எண்.19-ன்படி மேற்கண்ட நிபந்தனைகளுக்குட்பட்டு 5 (ஐந்து) வருட காலத்திற்கு ஸ்ரீ கன்னியம்மாள் புளூ மெட்டல்ஸ் உரிமையாளர் திரு.க.குமார் என்பவருக்கு கிராவல் / சாதாரண கற்கள் குவாரி உரிமம் வழங்குவதற்குரிய தகுதியான நிலப்பரப்பாக கருதப்படுகிறது.

7. மேலும், தமிழ்நாடு சிறுகனிம சலுகை விதிகள் 1959, விதி 41-ன்படி குவாரிப் பணி மேற்கொள்வது தொடர்பாக வரைவு சுரங்க திட்டத்தினை 90 தினங்களுக்குள் சமர்ப்பிக்குமாறு மனுதாரரைக் கேட்டுக் கொள்ளப்படுகிறது. மேலும் ஏற்பளிக்கப்பட்ட சுரங்கத்திட்டத்தின் தொடர்ச்சியாக 1959-ம் வருடத்திய தமிழ்நாடு சிறு கனிம சலுகை விதிகள், விதி எண்.42-ன்படி சுற்றுச் சூழல் தாக்க மதிப்பீட்டு ஆணையத்தின் தடையின்மை சான்று பெற்று சமர்ப்பிக்கும் பட்சத்தில் மட்டுமே குவாரி உரிமம் வழங்கப்படும் என இதன் மூலம் தெரிவிக்கப்படுகிறது.

  
04.04.25

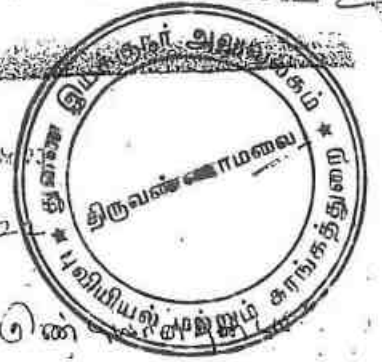
துணை இயக்குநர்,  
புவியியல் மற்றும் சுரங்கத்துறை,  
திருவண்ணாமலை.

பெறுநர்

ஸ்ரீ கன்னியம்மாள் புளூ மெட்டல்ஸ்,  
பங்குதாரர், திரு.குமார்,  
த/பெ.கண்ணையன்,  
எண்.660/22A, 2B, 2C, 2D, 660/1A, 1B  
ஆரப்பாக்கம் கிராமம்,  
வாலாஜாபாட.01  
காஞ்சிபுரம் மாவட்டம்.

நகல்.

1. தலைவர், மாநில சுற்றுச்சூழல் தாக்க மதிப்பீட்டு ஆணையம், சென்னை
2. ஆணையர், புவியியல் மற்றும் சுரங்கத்துறை, சென்னை-32.



பெ. வ. சி. சி. 6

பெ. சி. சி. 6

பெ. சி. சி. 6

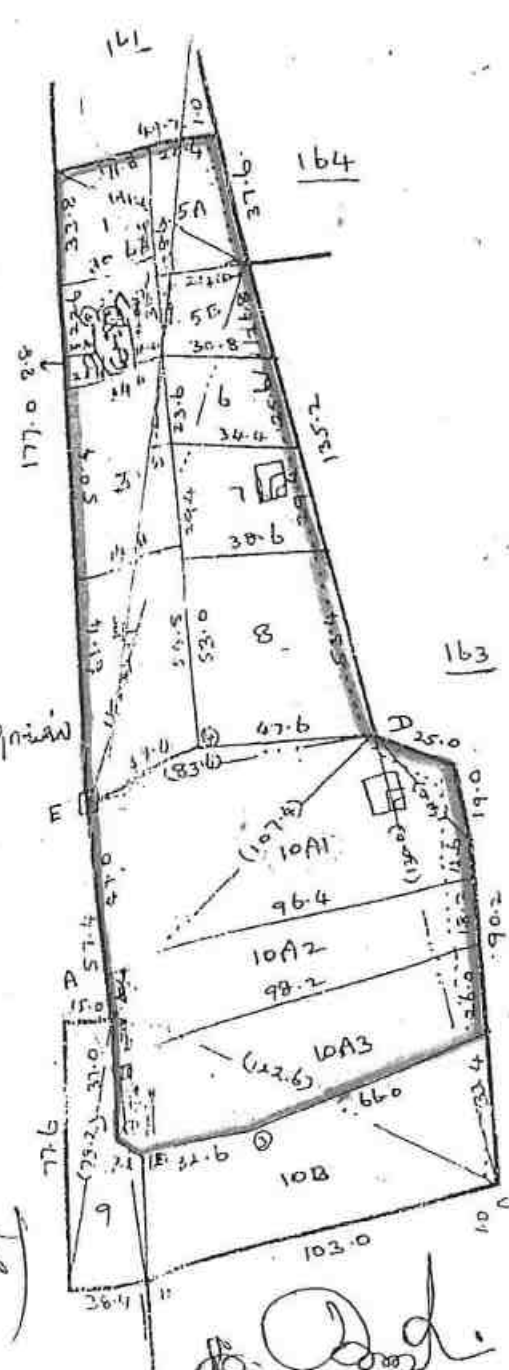
சென்னை

சென்னை

சென்னை

பெ. சி. சி. 6 2 வர் 63.0

சென்னை 12.4.1984

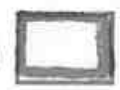


|   |       |      |   |
|---|-------|------|---|
| E | 155.8 | 28.0 | 7 |
|   | 42.4  | 30.4 | 7 |
|   | 38.0  | 34.6 | 6 |
|   | 41.0  | 38.0 | 5 |
|   | 36.0  | 28.4 | 5 |
|   | 32.0  |      |   |
| F | 83.6  | 52.4 | 4 |
| E | 48.0  |      |   |
| D | 122.6 |      |   |
| A | 10.4  |      |   |
|   | 15.0  |      |   |
|   | 76.6  |      |   |
|   | 42.2  |      |   |
|   | 36.8  |      |   |
| A |       |      |   |

சென்னை

சென்னை

LEASE APPLIED AREA



சென்னை நிர்வாக அலுவலர்  
77, செருட்டல் சிவாஜம்  
76, குண்டியார்தண்டலம் சிவாஜம்  
சென்னை மாநகரம்  
சென்னை மாநகரம்

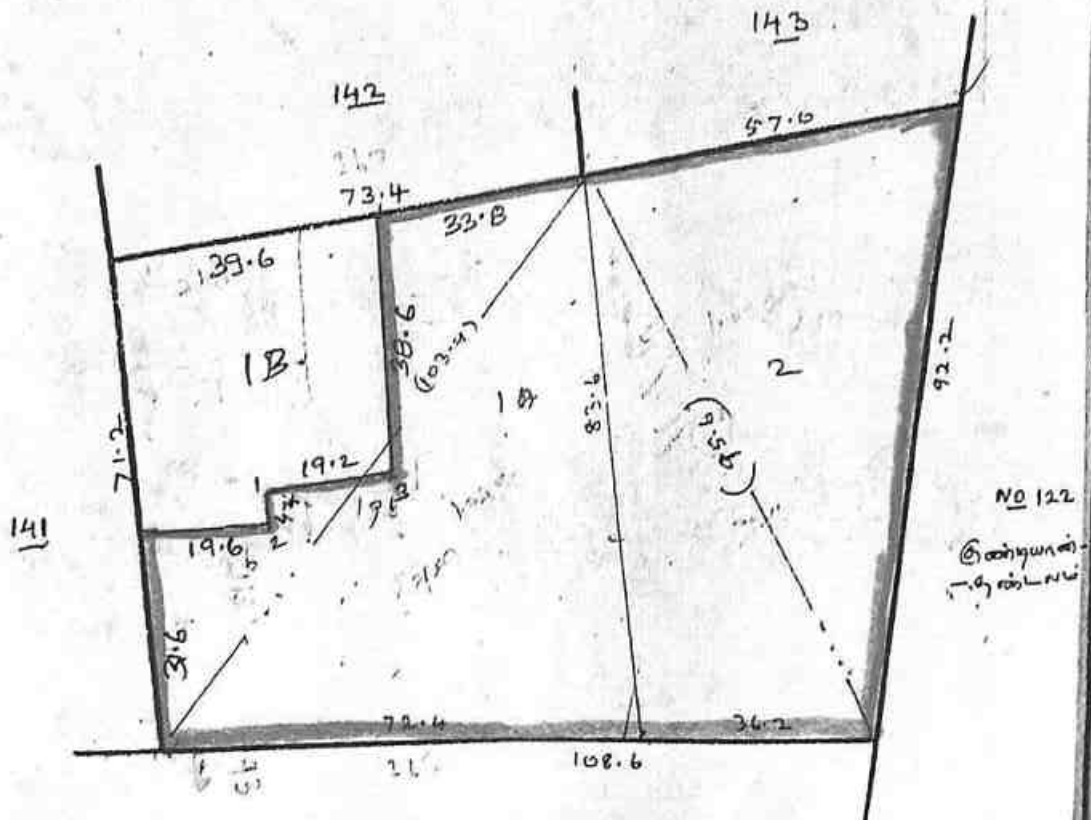
k.ken





வட்டம். திருவண்ணாமலை  
வட்டம். திருவண்ணாமலை  
புல எண். 144

எண். 121  
பெயர். புகழேந்தன்  
0 ஏ. 97.5



10/03/2012  
திருவண்ணாமலை  
79. புகழேந்தன் குழு.  
சென்னை வட்டம்.  
திருவண்ணாமலை மாவட்டம்.

APPLIED AREA



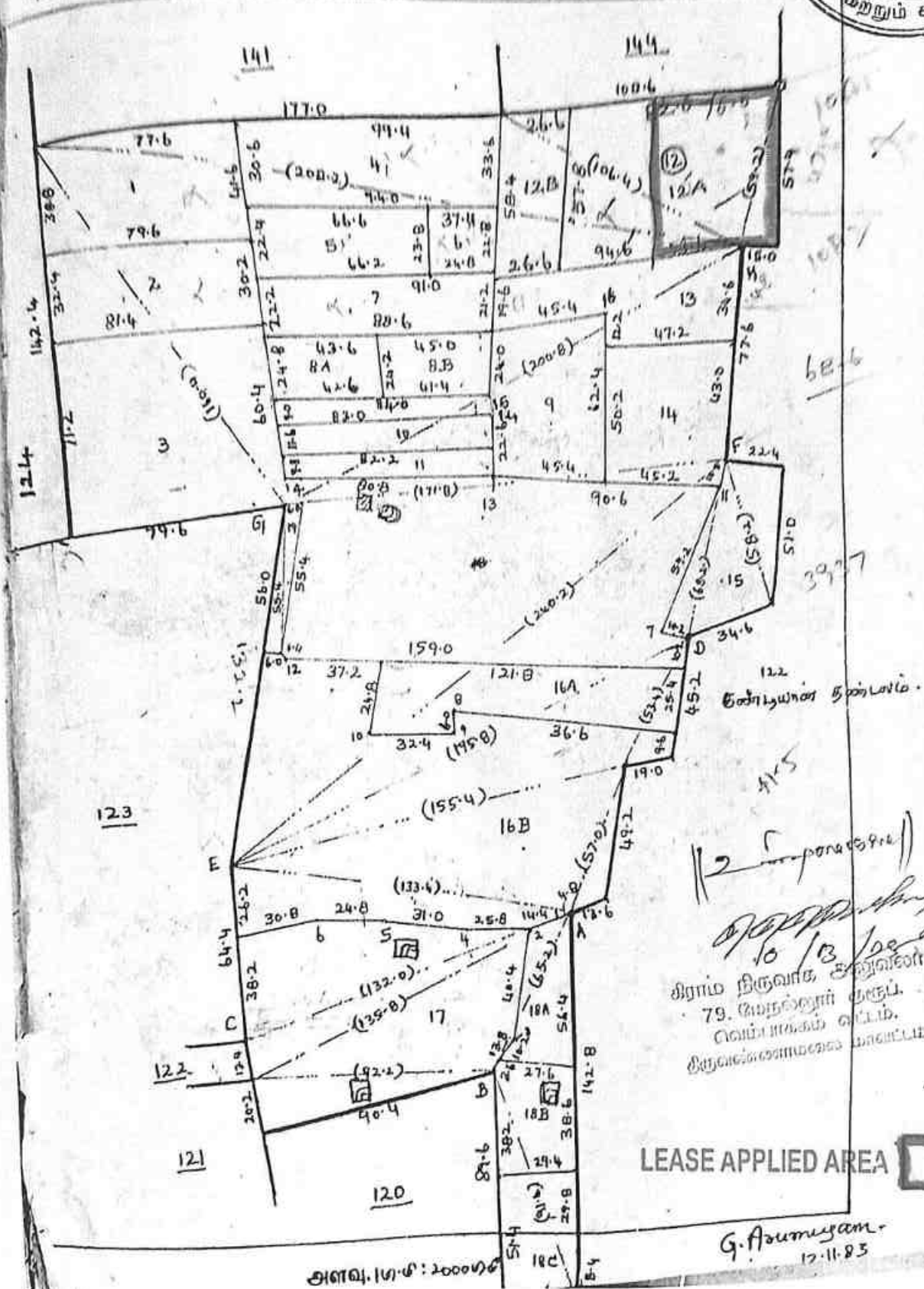
|   |      |         |     |
|---|------|---------|-----|
| 1 | 11.0 | (107-4) | 3.0 |
| 2 | 7.8  | 37.8    |     |
|   |      | 33.2    |     |
|   |      | E       |     |

அளவு. 1 மீ. = 1000 மீ.

தமிழ்நாடு  
தமிழ்நாடு  
தமிழ்நாடு 117

சிறுமம் { எண் 121  
              { பெண் முதலாதித்யா

முதலாதித்யர் 7 ஏ.டி.50



12-5-1968  
10/13/68  
திருமதி திருவாடி, திருவாரூர்  
79, கைத்தொட்டி தெரு.  
சென்னை 1  
திருவாரூர் மாவட்டம்.

LEASE APPLIED AREA

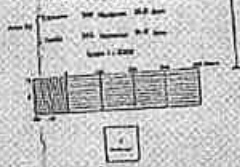
G. Arumugam -  
12.11.83







NO. 122  
KUNDIYANTANDALAM  
CHETTYARU TALUK  
TIRUVANNAMALAI DISTRICT



CHENGALPATTU H. G. R. DISTRICT

NO. 120  
SANTANALLUR

NO. 119  
MENALLUR

NO. 121  
PUNAITTANGAL

NO. 123  
SURUTTAL

NO. 124  
ACHCHERI

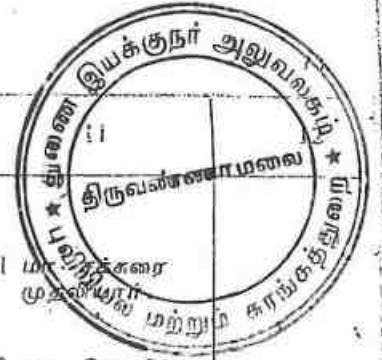
KANCHEEPURAM DISTRICT

LEASE APPLIED AREA



K. Kan.

பி. எஸ். 122. குண்டியாத்தண்டலம்.



| 1   | 2    | 3      | 4 | 5   | 6   | 7   | 8   | 9    | 10          |
|-----|------|--------|---|-----|-----|-----|-----|------|-------------|
| 159 | ---  | 159    | ர | பு  | ... | 7-3 | 4   | 3 85 | 1 79.0 6 90 |
| 160 | ...  | 160    | ர | பு  | ... | 7-3 | 4   | 3 85 | 0 33.0 1 25 |
| 161 | 1    | 161-1  | அ | புற | ... | ... | ... | ...  | 0 14.5 ...  |
|     | 2    | -2     | அ | பு  | ... | 7-3 | 4   | 3 85 | 0 14.0 0 55 |
|     |      |        |   |     |     |     |     |      | 0 28.5 0 55 |
| 162 | 1    | 162-1  | ர | பு  | ... | 7-3 | 4   | 3 85 | 0 11.0 0 42 |
|     | 2A   | -2பா   | ர | பு  | ... | 7-3 | 4   | 3 85 | 0 07.0 0 27 |
|     | 2B   | -2பா   | ர | பு  | ... | 7-3 | 4   | 3 85 | 0 02.5 0 09 |
|     | 3    | -3     | ர | பு  | ... | 7-3 | 4   | 3 85 | 0 16.0 0 61 |
|     | 4    | -4     | ர | பு  | ... | 7-3 | 4   | 3 85 | 0 20.0 0 76 |
|     | 5A   | -5பா   | ர | பு  | ... | 7-3 | 4   | 3 85 | 0 10.5 0 40 |
|     | 5B   | -5பா   | ர | பு  | ... | 7-3 | 4   | 3 85 | 0 07.0 0 27 |
|     | 6    | -6     | ர | பு  | ... | 7-3 | 4   | 3 85 | 0 08.0 0 31 |
|     | 7    | -7     | ர | பு  | ... | 7-3 | 4   | 3 85 | 0 11.5 0 44 |
|     | 8    | -8     | ர | பு  | ... | 7-3 | 4   | 3 85 | 0 22.0 0 84 |
|     | 9    | -9     | ர | பு  | ... | 7-3 | 4   | 3 85 | 0 14.5 0 54 |
|     | 10A1 | -10Aபா | ர | பு  | ... | 7-3 | 4   | 3 85 | 0 49.0 1 92 |
|     | 10A2 | -10Aபா | ர | பு  | ... | 7-3 | 4   | 3 85 | 0 21.0 0 80 |
|     | 10A3 | -10Aபா | ர | பு  | ... | 7-3 | 4   | 3 55 | 0 28.5 1 10 |

131 ம. நெல்லி யான்.

119 தா. கோவிந்த ராஜு.

புனைத் தாங்கல் ஏரி

அனாத் தனம்.

262 மு. நெல்லி யான்.

445 மு. நெல்லி யான் (1), மு. பூங்கா வனம் (2).

262 மு. நெல்லி யான்.

173 க. சின்ன கண்ணு.

173 க. சின்ன கண்ணு.

262 மு. நெல்லி யான்.

284 மு. பூங்கா வனம்.

284 மு. பூங்கா வனம்.

284 மு. பூங்கா வனம்.

173 க. சின்ன கண்ணு.

84 கண்ணப்பன்.

383 மு. வரத கவுண்டர்.

33 க. ஆட்டுக்காடி உடையார்.

335 மு. நெல்லி யான்.

கிராம நிர்வாக அலுவலர்  
77, கருட்டல் கிராமம்  
76, குண்டியாத்தண்டலம் கிராமம்  
வெம்பாக்கம் வட்டம்.

K. Ken

## அ-பதிவேடு விவரங்கள் - ஊரகம்

மாவட்டம் : திருவண்ணாமலை  
வட்டம் : வெம்பாக்கம்  
கிராமம் : குண்டியாந்தண்டலம்



|                              |            |                                |            |
|------------------------------|------------|--------------------------------|------------|
| 1. புல எண்                   | 162        | 9. மண் வயனமும்<br>ரகமும்       | 7 - 3      |
| 2. உட்பிரிவு எண்             | 10A3A      | 10. மண் தரம்                   | 4          |
| 3. பழைய புல<br>உட்பிரிவு எண் | 162-10A3   | 11. தீர்வை (ரூ - ஹெ)           | 3.85       |
| 4. பகுதி                     | P          | 12. பரப்பு (ஹெக்டேர் -<br>ஏர்) | 0 - 25.50  |
| 5. அரசு / ரயத்துவாரி         | ரயத்துவாரி | 13. மொத்த தீர்வை (ரூ<br>- பை)  | 1.00       |
| 6. நிலத்தின் வகை             | பஞ்சை      | 14. பட்டா எண்                  | 919        |
| 7. பாசன ஆதாரம்               | -          | 15. குறிப்பு                   | -          |
| 8. இரு போகமா                 | -          | 16. பெயர்                      | 1.மூர்த்தி |

## குறிப்பு:



மேற்கண்ட தகவல் / சான்றிதழ் நகல் விவரங்கள் மின் பதிவேட்டிலிருந்து  
1. பெறப்பட்டவை. இவற்றை தாங்கள் <https://eservices.tn.gov.in> என்ற  
இணைய தளத்தில் 06/10/122/162/10A3A/70299 என்ற குறிப்பு எண்ணை உள்ளீடு  
செய்து உறுதி செய்துகொள்ளவும்.

## அ-பதிவேடு விவரங்கள் - ஊரகம்



மாவட்டம் : திருவண்ணாமலை

வட்டம் : வெம்பாக்கம்

கிராமம் : குண்டியாந்தண்டலம்

|                              |            |                                |            |
|------------------------------|------------|--------------------------------|------------|
| 1. புல எண்                   | 162        | 9. மண் வயனமும்<br>ரகமும்       | 7 - 3      |
| 2. உட்பிரிவு எண்             | 10A3B      | 10. மண் தரம்                   | 4          |
| 3. பழைய புல<br>உட்பிரிவு எண் | 162-10A3   | 11. தீர்வை (ரூ - ஹெ)           | 3.85       |
| 4. பகுதி                     | P          | 12. பரப்பு (ஹெக்டேர் -<br>ஏர்) | 0 - 3.00   |
| 5. அரசு / ரயத்துவாரி         | ரயத்துவாரி | 13. மொத்த தீர்வை (ரூ<br>- பை)  | 0.10       |
| 6. நிலத்தின் வகை             | பஞ்சை      | 14. பட்டா எண்                  | 919        |
| 7. பாசன ஆதாரம்               | -          | 15. குறிப்பு                   | -          |
| 8. இரு போகமா                 | -          | 16. பெயர்                      | 1.மூர்த்தி |

## குறிப்பு:



மேற்கண்ட தகவல் / சான்றிதழ் நகல் விவரங்கள் மின் பதிவேட்டிலிருந்து  
1. பெறப்பட்டவை, இவற்றை தாங்கள் <https://eservices.tn.gov.in> என்ற  
இணைய தளத்தில் 06/10/122/162/10A3B/70299 என்ற குறிப்பு எண்ணை உள்ளீடு  
செய்து உறுதி செய்துகொள்ளவும்.

K. K.



## அ-பதிவேடு விவரங்கள் - ஊரகம்



மாவட்டம் : திருவண்ணாமலை

வட்டம் : வெம்பாக்கம்

கிராமம் : பூனைத்தாங்கல்

|                              |            |                                |            |
|------------------------------|------------|--------------------------------|------------|
| 1. புல எண்                   | 117        | 9. மண் வயனமும்<br>ரகமும்       | 7 - 2      |
| 2. உட்பிரிவு எண்             | 12A2       | 10. மண் தரம்                   | 3          |
| 3. பழைய புல<br>உட்பிரிவு எண் | 117-12A    | 11. தீர்வை (ரூ - ஹெ)           | 4.94       |
| 4. பகுதி                     | P          | 12. பரப்பு (ஹெக்டேர் -<br>ஏர்) | 0 - 42.00  |
| 5. அரசு / ரயத்துவாரி         | ரயத்துவாரி | 13. மொத்த தீர்வை (ரூ<br>- பை)  | 2.00       |
| 6. நிலத்தின் வகை             | பஞ்சை      | 14. பட்டா எண்                  | 312        |
| 7. பாசன ஆதாரம்               | -          | 15. குறிப்பு                   | -          |
| 8. இரு போகமா                 | -          | 16. பெயர்                      | 1.மூர்த்தி |

## குறிப்பு:



மேற்கண்ட தகவல் / சான்றிதழ் நகல் விவரங்கள் மின் பதிவேட்டிலிருந்து  
1. பெறப்பட்டவை. இவற்றை தாங்கள் <https://eservices.tn.gov.in> என்ற  
இணைய தளத்தில் 06/10/121/117/12A2/70126 என்ற குறிப்பு எண்ணை உள்ளீடு  
செய்து உறுதி செய்துகொள்ளவும்.



1 2 3 4 5 6 7 8 9 10

|           |               |    |   |       |       |        |        |                             |                                                                                                                      |
|-----------|---------------|----|---|-------|-------|--------|--------|-----------------------------|----------------------------------------------------------------------------------------------------------------------|
| 141-2A 2A | 141-2A D      | 4  | 1 | 7-2-3 | 4.94  | 0.01.5 | 0.08   | 24. சிப்சுமார்<br>மகன் மகன் |                                                                                                                      |
| 141- (2B) | 141-2B D      | 4  | 1 | 7-2-3 | 4.94  | 0.54.0 | 2.66   | 24. சிப்சுமார்<br>மகன் மகன் |                                                                                                                      |
| 2E1       | 141-2E1<br>un | D  | 4 | 1     | 7-2-3 | 4.94   | 0.01.0 | 0.06                        | 24. சிப்சுமார்<br>மகன் மகன்                                                                                          |
| -3        | 141-3. D      | un | 4 | 1     | 7-2-3 | 4.94   | 0.14.5 | 0.70                        | 175. சிப்சுமார்<br>மகன் மகன்                                                                                         |
|           |               |    |   |       |       | 0.15.5 | 0.76   |                             | 2. மகன் (1)<br>3. மகன் (2)<br>4. சிப்சுமார்<br>மகன் மகன்<br>5. சிப்சுமார்<br>மகன் மகன்<br>6. சிப்சுமார்<br>மகன் மகன் |
| 2E2       | 141-2E2 D     | un | 4 | 1     | 7-2-3 | 4.94   | 0.11.5 | 0.66                        | 176. சிப்சுமார்<br>மகன் மகன்                                                                                         |
| -4-141-4  | un            | D  | 4 | 1     | 7-2-3 | 4.94   | 0.18.0 | 1.00                        | 24. சிப்சுமார்<br>மகன் மகன்                                                                                          |
| -5        | 141-5 D       | un | 4 | 1     | 7-2-3 | 4.94   | 0.03.5 | 0.20                        | 177. சிப்சுமார்<br>மகன் மகன்                                                                                         |
|           |               |    |   |       |       | 0.33.0 | 1.84   |                             | 2. மகன் (1)<br>3. மகன் (2)                                                                                           |

AS per  
PA-2/97  
DI:8.9.8

2. மகன்

2. மகன்

2. மகன்

10/03/28  
திருவ. திருவா. அலுவலர்  
79. மெதல்லை குருப்.  
வெம்பாக்கம் வட்டம்.  
திருவ. திருவா. அலுவலர்

AS per Tk 84/1022/1430 dt: 27.2.2021

|     |     |     |   |   |   |       |      |         |      |      |             |
|-----|-----|-----|---|---|---|-------|------|---------|------|------|-------------|
| 141 | 281 | 282 | 5 | 4 | 1 | 7-2-3 | 4.94 | 0.27.00 | 1.33 | 263  | ச. பஞ்சவர்ண |
| 282 | "   | "   | " | " | " | "     | "    | 0.27.00 | 1.33 | 285  | ச. பஞ்சவர்ண |
|     |     |     |   |   |   |       |      | 0.54.00 | 2.66 |      |             |
| 144 | 1A  | 144 | 5 | 4 | 1 | 7-2-3 | 4.94 | 0.42.08 | 2.29 | 7.62 | ச. பஞ்சவர்ண |
| -1B | "   | "   | " | " | " | "     | "    | 0.14.92 | 0.74 | 1.68 | ச. பஞ்சவர்ண |
|     |     |     |   |   |   |       |      | 0.57.00 | 2.82 |      |             |

00001430 / 25.10.22

தி. எண். 121 பிள்ளை தாங்கல்.



| 1   | 2   | 3     | 4   | 5   | 6   | 7   | 8    | 9      | 10     |                                                 |                                                 |
|-----|-----|-------|-----|-----|-----|-----|------|--------|--------|-------------------------------------------------|-------------------------------------------------|
| 144 | (1) | 144-1 | 0   | 141 | ... | 7.2 | 3    | 4.04   | 0 67.0 | 2 88                                            | 108 க. பழனி உடையார் (1),*<br>இன்னும் 3 தபர்கள். |
| 2   | 2   | 0     | 141 | ... | 7.2 | 3   | 4.04 | 0 40.6 | 2 00   | 108 க. பழனி உடையார் (1),*<br>இன்னும் 3 தபர்கள். |                                                 |
|     |     |       |     |     |     |     |      | 0 97.8 | 4 82   |                                                 |                                                 |

ஆகமொத்தம் .. 117 05.0 1,138.89

இறவை வலுவ .. 9 81

நிகரத் தீர்வை .. 1,138 88

மொத்தம் 7 :

நூற்று பத்தேன்கு எழுதும், டெர்சு, ஆம், ஐந்து டெர்சு ஆம்.

(ரூபாய் ஆயிரத்து நூற்று முப்பத்தெட்டுப் பைசா அறுபத்தி ஒன்பது மட்டும்.)

தபர்கள் விவரம்.

பட்டதாரிகளின் பெயர்கள்.

| சர்வே<br>தெம்பர். | சப்<br>டிவிசன்<br>அல்லது<br>டிவிசன். | பட்டா<br>தெம்பர். |                                                                                              |
|-------------------|--------------------------------------|-------------------|----------------------------------------------------------------------------------------------|
| (1)               | (2)                                  | (3)               | (4)                                                                                          |
| 127               | 13                                   | 144               | குப்புசாமி கவுண்டர் 1, துரைசாமி கவுண்டர் 2, கன்னியப்பன் 3.                                   |
| 128               | 7                                    | 153               | சுப்பையன் 1, முகாம்பரம் 2, கோ. சரோஜா 3.                                                      |
| 26                | 5                                    | 154               | வடிவாம்பரம் 1, ராஜாம்பரம் 2, கெம்பு சுமமாள் 3.                                               |
| 38                | 2C                                   | 155               | கு. ஆமிரத்திலிக்கு முதலியார் 1, அ. செல்வமணி 2, அ. சிவா<br>னத்தம் 3.                          |
| 39                | 2, 5                                 |                   |                                                                                              |
| 59                | 8                                    |                   |                                                                                              |
| 69                | 3                                    | 156               | துரைசாமி முதலியார் 1, பொன்னன் 2, கணேசன் 3.                                                   |
| 124               | 7                                    | 157               | பொன்னம்பல முதலி 1, சாம்பலிவ முதலி 2, கோபால் 3.                                               |
| 117               | 12                                   | 158               | கண்ணப்ப உடையார் 1, அண்ணாமலை 2, பொ. இஷ்டப்<br>பாண்டியன் 3.                                    |
| 117               | 16A, 16B                             | 169               | நடேச கவுண்டர் 1, முருகேச கவுண்டர் 2, கருமார் 3, செல்வ<br>குட்டி 4, செல்வராஜ் 5, சம்பந்தம் 6. |
| 119               | 1, 2                                 | 160               | முருகேச கவுண்டர் 1, ஜீனு 2, கிருஷ்ணன் 3, அண்ணாமலை,<br>பெருமால் 4, ராஜி 6.                    |
| 93                | 3                                    | 167               | தேவராஜ் 1, சுப்பிரமணியன் 2, ராஜசக்தி 3, கார்த்திகேயன் 4.                                     |
| 144               | 1, 2                                 | 108               | அ. பழனி உடையார் 1, கண்ணப்ப உடையார் 2, கிருஷ்ணப்ப உடையார் 3, தங்கவேலு உடையார் 4.              |
| 95                | 4                                    | 170               | க. தேவராஜ் 1, கார்த்திகேயன் 2, ராமசுந்தர் 3.                                                 |

12/03/2021  
திருவண்ணாமலை மாவட்டம்  
79. மேநல்லூர் குருப்.  
வெம்பாக்கம் வட்டம்.  
திருவண்ணாமலை மாவட்டம்





ANNEXURE - V

தமிழ்நாடு அரசு

வருவாய் மற்றும் பேரிடர் மேலாண்மைத் துறை

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

மாவட்டம் : திருவண்ணாமலை

வட்டம் : வெம்பாக்கம்

வருவாய் கிராமம் : குண்டியாந்தண்டலம்

பட்டா எண் : 918

உரிமையாளர்கள் பெயர்

1. கன்னைய நாயுடு

மகன்

மூர்த்தி



| புல எண் | உட்பிரிவு | புன்செய்   |         | நன்செய்    |         | மற்றவை     |         | குறிப்புகரைகள்                                                                                                                 |
|---------|-----------|------------|---------|------------|---------|------------|---------|--------------------------------------------------------------------------------------------------------------------------------|
|         |           | பரப்பு     | தீர்வை  | பரப்பு     | தீர்வை  | பரப்பு     | தீர்வை  |                                                                                                                                |
|         |           | ஹெக் - ஏர் | ரூ - பை | ஹெக் - ஏர் | ரூ - பை | ஹெக் - ஏர் | ரூ - பை |                                                                                                                                |
| 162     | 1         | 0 - 11.00  | 0.42    | --         | --      | --         | --      | 2024/0103/06/457950-<br>-----<br>Digitally<br>signed:approved<br>through AutoMutation<br>-<br>27/12/2024<br>06:38:45:PM        |
| 162     | 2A        | 0 - 7.00   | 0.27    | --         | --      | --         | --      | 2024/0103/06/457950-<br>-- --WELL---<br>Digitally<br>signed:approved<br>through AutoMutation<br>-<br>27/12/2024<br>06:38:45:PM |
| 162     | 2B        | 0 - 2.50   | 0.09    | --         | --      | --         | --      | 2024/0103/06/457950-<br>-----<br>Digitally<br>signed:approved<br>through AutoMutation<br>-<br>27/12/2024<br>06:38:45:PM        |
| 162     | 6         | 0 - 8.00   | 0.31    | --         | --      | --         | --      | 2024/0103/06/457950-<br>-----<br>Digitally<br>signed:approved<br>through AutoMutation<br>-<br>27/12/2024<br>06:38:45:PM        |
|         |           | 0 - 28.50  | 1.09    |            |         |            |         |                                                                                                                                |

K. L. S.

-273-



## குறிப்பு :

|  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
|--|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|  | <p>1. மேற்கண்ட தகவல் / சான்றிதழ் நகல் விவரங்கள் மின் பதிவேட்டிலிருந்து பெறப்பட்டவை. இவற்றை தாங்கள் <a href="https://eservices.tn.gov.in">https://eservices.tn.gov.in</a> என்ற இணைய தளத்தில் 06/10/2025/00918/150288 என்ற குறிப்பு எண்ணை உள்ளிடு செய்து உறுதி செய்துகொள்ளவும்.</p> <p>2. இத் தகவல்கள் 18-03-2025 அன்று 05:11:29 PM நேரத்தில் அச்சடிக்கப்பட்டது.</p> <p>3. கைப்பேசி கேமராவின் 2D barcode படிப்பான் மூலம் படித்து 3G/GPRS வழி இணையதளத்தில் சரிபார்க்கவும்</p> |
|--|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

K. Kan.



தமிழ்நாடு அரசு

வருவாய் மற்றும் பேரிடர் மேலாண்மைத் துறை

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

மாவட்டம் : திருவண்ணாமலை

வட்டம் : வெம்பாக்கம்

வருவாய் கிராமம் : குண்டியாந்தண்டலம்

பட்டா எண் : 919

உரிமையாளர்கள் பெயர்

1.

கன்னையன்

மகன்

மூர்த்தி



K. I. An.

| புல எண் | உட்பிரிவு | புன்செய்   |         | நன்செய்    |         | மற்றவை     |         | குறிப்புகள்                                                                                                                                              |
|---------|-----------|------------|---------|------------|---------|------------|---------|----------------------------------------------------------------------------------------------------------------------------------------------------------|
|         |           | பரப்பு     | தீர்வை  | பரப்பு     | தீர்வை  | பரப்பு     | தீர்வை  |                                                                                                                                                          |
|         |           | ஹெக் - ஏர் | ரூ - பை | ஹெக் - ஏர் | ரூ - பை | ஹெக் - ஏர் | ரூ - பை |                                                                                                                                                          |
| 162     | 10A1      | 0 - 49.00  | 1.92    | --         | --      | --         | --      | 2024/0103/06/457952-<br>Digitally signed:Vadivel<br>A<br>Head Quarters Deputy<br>Tahsildar<br>10/01/2025<br>10:00:34:PM                                  |
| 162     | 10A3A     | 0 - 25.50  | 1.00    | --         | --      | --         | --      | 2024/0103/06/457952-<br>-2022/06/10/000061SD<br>-----<br>Digitally signed:Vadivel<br>A<br>Head Quarters Deputy<br>Tahsildar<br>10/01/2025<br>10:00:34:PM |
| 162     | 10A3B     | 0 - 3.00   | 0.10    | --         | --      | --         | --      | 2025/0103/06/463765-<br>-2022/06/10/000061SD<br>-----<br>Digitally signed:Vadivel<br>A<br>Head Quarters Deputy<br>Tahsildar<br>03/02/2025<br>07:47:54:PM |
| 162     | 3         | 0 - 16.00  | 0.61    | --         | --      | --         | --      | 2024/0103/06/457952-<br>-----<br>Digitally signed:Vadivel<br>A<br>Head Quarters Deputy<br>Tahsildar<br>10/01/2025<br>10:00:34:PM                         |
| 162     | 4         | 0 - 20.00  | 0.76    | --         | --      | --         | --      | 2024/0103/06/457952-<br>-----<br>Digitally signed:Vadivel<br>A<br>Head Quarters Deputy<br>Tahsildar<br>10/01/2025<br>10:00:34:PM                         |
| 162     | 5A        | 0 - 10.50  | 0.40    | --         | --      | --         | --      | 2024/0103/06/457952-<br>-----<br>Digitally signed:Vadivel<br>A<br>Head Quarters Deputy<br>Tahsildar<br>10/01/2025<br>10:00:34:PM                         |



-279-



|     |    |           |      |    |    |    |    |                                                                                                                                  |
|-----|----|-----------|------|----|----|----|----|----------------------------------------------------------------------------------------------------------------------------------|
| 162 | 5B | 0 - 7.00  | 0.27 | -- | -- | -- | -- | 2024/0103/06/457952-<br>-----<br>Digitally signed:Vadivel<br>A<br>Head Quarters Deputy<br>Tahsildar<br>10/01/2025<br>10:00:34:PM |
| 162 | 7  | 0 - 11.50 | 0.44 | -- | -- | -- | -- | 2024/0103/06/457952-<br>-----<br>Digitally signed:Vadivel<br>A<br>Head Quarters Deputy<br>Tahsildar<br>10/01/2025<br>10:00:34:PM |
| 162 | 8  | 0 - 22.00 | 0.84 | -- | -- | -- | -- | 2024/0103/06/457952-<br>-----<br>Digitally signed:Vadivel<br>A<br>Head Quarters Deputy<br>Tahsildar<br>10/01/2025<br>10:00:34:PM |
|     |    | 1 - 64.50 | 6.34 |    |    |    |    |                                                                                                                                  |

## குறிப்பு :

|  |                                                                                                                                                                                                                                                                           |
|--|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|  | 1. மேற்கண்ட தகவல் / சான்றிதழ் நகல் விவரங்கள் மின் பதிவேட்டிலிருந்து பெறப்பட்டவை. இவற்றை தாங்கள் <a href="https://eservices.tn.gov.in">https://eservices.tn.gov.in</a> என்ற இணைய தளத்தில் 06/10/122/00919/150299 என்ற குறிப்பு எண்ணை உள்ளீடு செய்து உறுதி செய்துகொள்ளவும். |
|  | 2. இத் தகவல்கள் 12-04-2025 அன்று 04:27:12 PM நேரத்தில் அச்சடிக்கப்பட்டது.                                                                                                                                                                                                 |
|  | 3. கைப்பேசி கேமராவின் 2D barcode படிப்பான் மூலம் படித்து 3G/GPRS வழி இணையதளத்தில் சரிபார்க்கவும்                                                                                                                                                                          |

K. Kan.



தமிழ்நாடு அரசு

வருவாய் மற்றும் பேரிடர் மேலாண்மைத் துறை

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

மாவட்டம் : திருவண்ணாமலை

வட்டம் : வெம்பாக்கம்

வருவாய் கிராமம் : பூனைத்தாங்கல்

பட்டா எண் : 312

உரிமையாளர்கள் பெயர்

1. கன்னையா நாயுடு

மகன்

மூர்த்தி

| புல எண் | உட்பிரிவு | புன்செய்   |         | நன்செய்    |         | மற்றவை     |         | குறிப்புரைகள்                                                                                                                                    |
|---------|-----------|------------|---------|------------|---------|------------|---------|--------------------------------------------------------------------------------------------------------------------------------------------------|
|         |           | பரப்பு     | தீர்வை  | பரப்பு     | தீர்வை  | பரப்பு     | தீர்வை  |                                                                                                                                                  |
|         |           | ஹெக் - ஏர் | ரூ - பை | ஹெக் - ஏர் | ரூ - பை | ஹெக் - ஏர் | ரூ - பை |                                                                                                                                                  |
| 117     | 12A2      | 0 - 42.00  | 2.00    | --         | --      | --         | --      | 2024/0103/06/457953-<br>-2022/06/10/000013SD<br>-----<br>Digitally<br>signed: approved<br>through AutoMutation<br>-<br>27/12/2024<br>06:42:57:PM |
|         |           | 0 - 42.00  | 2.00    |            |         |            |         |                                                                                                                                                  |

குறிப்பு :



- மேற்கண்ட தகவல் / சான்றிதழ் நகல் விவரங்கள் மின் பதிவேட்டிலிருந்து பெறப்பட்டவை. இவற்றை தாங்கள் <https://eservices.tn.gov.in> என்ற இணைய தளத்தில் 06/10/121/00312/90126 என்ற குறிப்பு எண்ணை உள்ளிட்டு செய்து உறுதி செய்துகொள்ளவும்.
- இத் தகவல்கள் 18-03-2025 அன்று 05:21:39 PM நேரத்தில் அச்சடிக்கப்பட்டது.
- கைப்பேசி கேமராவின் 2D barcode படிப்பான் மூலம் படித்து 3G/GPRS வழி இணையதளத்தில் சரிபார்க்கவும்



தமிழ்நாடு அரசு

வருவாய் மற்றும் பேரிடர் மேலாண்மைத் துறை  
நில உரிமை விபரங்கள் : இ. எண் 10(1) பிரிவு



மாவட்டம் : திருவண்ணாமலை

வட்டம் : வெம்பாக்கம்

வருவாய் கிராமம் : பூனைத்தாங்கல்

பட்டா எண் : 312

உரிமையாளர்கள் பெயர்

1. கன்னையா நாயுடு

மகன்

மூர்த்தி

| புல எண் | உட்பிரிவு | புன்செய்    |         | நன்செய்     |         | மற்றவை      |         | குறிப்புரைகள்                                                                                                                                  |
|---------|-----------|-------------|---------|-------------|---------|-------------|---------|------------------------------------------------------------------------------------------------------------------------------------------------|
|         |           | பரப்பு      | தீர்வை  | பரப்பு      | தீர்வை  | பரப்பு      | தீர்வை  |                                                                                                                                                |
|         |           | ஹெக்ட - ஏர் | ரூ - பை | ஹெக்ட - ஏர் | ரூ - பை | ஹெக்ட - ஏர் | ரூ - பை |                                                                                                                                                |
| 144     | 1A        | 0 - 42.08   | 2.08    | --          | --      | --          | --      | 2024/0103/06/457953-<br>2022/06/10/000014SD<br>-----<br>Digitally<br>signed:approved<br>through AutoMutation<br>-<br>27/12/2024<br>06:42:57:PM |
|         |           | 0 - 42.08   | 2.08    |             |         |             |         |                                                                                                                                                |

குறிப்பு :



- மேற்கண்ட தகவல் / சான்றிதழ் நகல் விவரங்கள் மின் பதிவேட்டிலிருந்து பெறப்பட்டவை. இவற்றை தாங்கள் <https://eservices.tn.gov.in> என்ற இணைய தளத்தில் 06/10/121/00312/90126 என்ற குறிப்பு எண்ணை உள்ளீடு செய்து உறுதி செய்துகொள்ளவும்.
- இத் தகவல்கள் 12-04-2025 அன்று 06:52:01 PM நேரத்தில் அச்சடிக்கப்பட்டது.
- கைப்பேசி கேமராவின் 2D barcode படிப்பான் மூலம் படித்து 3G/GPRS வழி இணையதளத்தில் சரிபார்க்கவும்

K. Iyer



தமிழ்நாடு அரசு

வருவாய் மற்றும் பேரிடர் மேலாண்மைத் துறை

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

மாவட்டம் : திருவண்ணாமலை

வட்டம் : வெம்பாக்கம்

வருவாய் கிராமம் : பூனைத்தாங்கல்

பட்டா எண் : 312

உரிமையாளர்கள் பெயர்

1. கன்னையா நாயுடு

மகன்

மூர்த்தி

| புல எண் | உட்பிரிவு | புன்செய்   |         | நுன்செய்   |         | மற்றவை     |         | குறிப்புரைகள்                                                                                                           |
|---------|-----------|------------|---------|------------|---------|------------|---------|-------------------------------------------------------------------------------------------------------------------------|
|         |           | பரப்பு     | தீர்வை  | பரப்பு     | தீர்வை  | பரப்பு     | தீர்வை  |                                                                                                                         |
|         |           | ஹெக் - ஏர் | ரூ - பை | ஹெக் - ஏர் | ரூ - பை | ஹெக் - ஏர் | ரூ - பை |                                                                                                                         |
| 144     | 2         | 0 - 40.50  | 2.00    | --         | --      | --         | --      | 2024/0103/06/457953-<br>-----<br>Digitally<br>signed:approved<br>through AutoMutation<br>-<br>27/12/2024<br>06:42:57:PM |
|         |           | 0 - 40.50  | 2.00    |            |         |            |         |                                                                                                                         |

குறிப்பு :



- மேற்கண்ட தகவல் / சான்றிதழ் நகல் விவரங்கள் மின் பதிவேட்டிலிருந்து பெறப்பட்டவை. இவற்றை தாங்கள் <https://eservices.tn.gov.in> என்ற இணைய தளத்தில் 06/10/121/00312/90126 என்ற குறிப்பு எண்ணை உள்ளீடு செய்து உறுதி செய்துகொள்ளவும்.
- இத் தகவல்கள் 12-04-2025 அன்று 06:53:01 PM நேரத்தில் அச்சடிக்கப்பட்டது.
- கைப்பேசி கேமராவின் 2D barcode படிப்பான் மூலம் படித்து 3G/GPRS வழி இணையதளத்தில் சரிபார்க்கவும்





எண் 2  
கிராமத்தில் வருடவாரி புலவாரி வைப்பற்று சாகுபடி அடங்கல் கணக்கு

[illegible]

புதிதாய்வு பச்சியில் கி. பி. 1982  
மாவட்டம் தென்மேற்கு  
விளாங்கு காவல்  
பி. பி. 1982

[illegible]

K. Leon



922/2025

-291-

ANNEXURE - VI



தமிழ்நாடு தமில்நாடு TAMILNADU

SRI KANNANMAL BLUE NBALS

நாள்...16/03/25.....

ரூபாய்...500/-.....

AW 120993

R. 86m..  
R. கரேஷ்,  
நத்திரத்தாள் விற்பனையாளர்  
உரிமம் எண். 11/2011  
சுப்தகலாசாரம்,  
செம்பாக்கம் ஊ.ப.க. (2. மலை)

உ

குத்தகை உடன்படிக்கை ஆவணம்

வருட வாடகை - ரூபாய். 20,000.00

முன்பணம் - ஏதுமில்லை

காலம் -13 (பதிமூன்று) ஆண்டுகள்

2025ஆம் (இரண்டாயிரத்து இருபத்து ஐந்து) வருடம், மார்ச் மாதம் 18ஆம் தேதி, (பதினெட்டாம் தேதி) காஞ்சிபுரம் மாவட்டம், வாலாஜாபாத் வட்டம், எண். 8 ஆற்பாக்கம் கிராமம், மண்டபம் கூட்டுறோடு, இலக்கம் 299 இல்லத்தில் வசிக்கும், திரு. J. கண்ணைய நாயுடு அவர்களின் குமாரர் 44 வயதுடைய திரு. K. மூர்த்தி (ஆதார் அடையாள அட்டை எண். 4208 3726 7768, கைபேசி எண். 9600545459) ஆகியவர்கள் 1வது பார்ட்டியாகவும்:-

2வது பார்ட்டி

1வது பார்ட்டி

K. Kan

K. Murthy

922

|                                      |
|--------------------------------------|
| 1 புத்தகம் 2025 ம் வருடத்திய.....ஆம் |
| ஆவணம்.....                           |
| பதிவு செய்யப்பட்டது                  |



K. Kan



காஞ்சிபுரம் மாவட்டம், வாலாஜாபாத் வட்டம், எண்.8 ஆற்பாக்கம் கிராமம், சர்வே எண்.660/1B உடைய முகவரியில் இயங்கி வரும் SRI KANNAN BLUE METALS (PAN No. BGMPK4568C) நிறுவனத்திற்காக திரு.பழனிசாமி மற்றும் காரங்கத்துறை நிறுவனத்தின் உரிமையாளரும் மேற்படி எண்.8 ஆற்பாக்கம் கிராமம், மண்டபம் கூட்டுறவு, இலக்கம் 2/32 உடைய இல்லத்தில் வசிக்கும், திரு.கண்ணையன் அவர்களின் குமாரருமான 50 வயதுடைய திரு.க.குமார் (ஆதார் அடையாள அட்டை எண். 6084 4849 9670, கைபேசி எண். 9585504309) அவர்கள் 2வது பார்ட்டியாகவும் ஆக நாமிரு பார்ட்டிகளும் சேர்ந்து சம்மதித்து ஏற்படுத்திக் கொண்ட குத்தகை உடன்படிக்கை ஆவணம் என்னவென்றால்:-

இதன்கீழ் சொத்து விவரத்தில் நன்கு விவரிக்கப்பட்டுள்ள சொத்துக் களானது நம்மில் 1வது பார்ட்டி சொந்தம். அதாவது 1வது பார்ட்டி சுயார்ஜிதமாய் கடந்த 22.10.2020ஆம் நாளில் திருமதி.பட்டம்மாள், திரு.பழனிசாமி, திரு.ஆறுமுகம் ஆகியவர்களிடமிருந்து கிரையம் பெற்று அந்த கிரைய ஆவண மானது தூசி சார்பதிவாளர் அலுவலகத்தில் 1 புத்தகம், 2020ஆம் ஆண்டின் 2259 எண்ணாகப் பதிவான கிரைய ஆவணத்தின்படியும்,

கடந்த 27.12.2024ஆம் நாளில் திருமதி.லட்சுமி அவர்களிடமிருந்து கிரையம் பெற்று அந்த கிரைய ஆவணமானது தூசி சார்பதிவாளர் அலுவலகத்தில் 1 புத்தகம், 2024ஆம் ஆண்டின் 3712 எண்ணாகப் பதிவான கிரைய ஆவணத்தின்படியும் மற்றும்

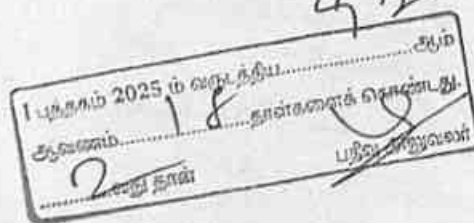
1வது பார்ட்டியின் சகோதரர் திரு.க.சுமார் அவர்களின் கடந்த 27.12.2024 ஆம் நாளில் 1வது பார்ட்டிக்கு ஒரு செட்டில்மெண்ட் ஆவணம் எழுதிக் கொடுத்து அந்த கிரைய ஆவணமானது தூசி சார்பதிவாளர் அலுவலகத்தில் 1 புத்தகம், 2024ஆம் ஆண்டின் 3715 எண்ணாகப் பதிவான செட்டில்மெண்ட் ஆவணத்தின்படியும்,

2வது பார்ட்டி

K. Kan.

1வது பார்ட்டி

le. Noray







ஆக மேற்படி விதமாக 1வது பார்ட்டி கைப்பற்றி சகல உரிமைகளுடன் சர்வ சுதந்திரங்களுடன் ஆண்டு அனுபவித்து வருவதும் எண். 76 குண்டியாந் தண்டலம் கிராமத்தில் 1வது பார்ட்டியின் பெயரில் எண். 674, 918, 919 ஆகிய பட்டாக்களிலும் மற்றும் எண். 78 பூனைத்தாங்கல் கிராமத்தில் 1வது பார்ட்டியின் பெயரில் எண். 312 தனிப்பட்டாவிலும் அடங்கியதுமான சொத்து விவரத்தில் நன்கு விவரிக்கப்பட்டுள்ள சொத்துக்களை 1வது பார்ட்டி குத்தகைக்கு வாடைகக்கு விடப்போவதாக கூறியதின் பேரில் 2வது பார்ட்டியானவர் தனக்கு குத்தகைக்கு விடுமாறு கேட்டு 1வது பார்ட்டியும் அதற்கு உடன்பட்டு ஒப்புக் கொண்டு அதன்படி ஒப்பந்த சொத்துக்களை இன்று தேதியில் 1வது பார்ட்டி யானவர் 2வது பார்ட்டியிடம் சுவாதீனம் ஒப்படைத்து விட்டார். மேலும் கீழ்க்கண்ட நிபந்தனை களின்படி அனுசரித்து நடக்கவும் நாம் இருபார்ட்டிகளும் மனப்பூர் வமாய் ஒப்புக் கொள்கின்றோம்.

#### நிபந்தனைகள்

1. சொத்து விவரத்தில் நன்கு விவரிக்கப்பட்டுள்ள சொத்துக்களுக்கு ஆண்டு ஒன்றுக்கு சேவை வரி உள்பட குத்தகை ரூபாய்.20,000.00 எழுத்தால் ரூபாய் இருபதாயிரம் வீதம் நிர்ணயிக்கப்பட்டு சொத்துக்களை 1வது பார்ட்டி 2வது பார்ட்டியின் வசம் சுவாதீனம் ஒப்படைத்து விட்டார்.

2. இந்த குத்தகை ஏற்பாட்டிற்கு முன்பணம் ஏதும் 2வது பார்ட்டி யானவர் 1வது பார்ட்டிக்கு செலுத்தவில்லை.

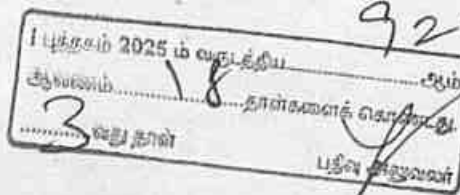
3. ஆண்டு ஒன்றுக்கு குத்தகை தொகையான ரூபாய்.20,000.00 எழுத்தால் ரூபாய் இருபதாயிரத்தினை வருடப்பிரதி வருடம் மார்ச் மாதம் 20ஆம் தேதியோ அதற்கு முன்னதாகவோ 2வது பார்ட்டியானவர் 1வது பார்ட்டியிடம் செலுத்தி உரிய ரசீது பெற்று கொள்ள வேண்டியது.

2வது பார்ட்டி

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1வது பார்ட்டி

K. Norway





4. இந்த குத்தகை ஒப்பந்தமானது இன்று முதல் ஆண்டு களுக்கு மட்டும் அதாவது 18.03.2025 முதல் எதிர் வரும் தேதி வரையிலான காலத்திற்கு மட்டும் நாம் ஏற்படுத்தி கொண்டுள்ளோம்.

5. இதன்கீழ் சொத்து விவரத்தில் நன்கு விவரிக்கப்பட்டுள்ள நிலங்களில் உள்ள கற்களை 2வது பார்ட்டியானவர் அரசு அனுமதியுடன் கல்குவாரி அமைத்து அதற்குண்டான தொகைகளை அரசுக்கு செலுத்தி தன் சொந்த செலவில் கற்களை வெட்டி எடுத்து விற்பனை செய்து கொள்ள வேண்டியது. கல்குவாரி சம்மந்தப்பட்ட அனைத்து அரசு விதிகளுக்கும் 2வது பார்ட்டி கட்டுப்பட சம்மதிக்கின்றார். இந்த ஒப்பந்த சொத்துக்களுக்குண்டான சொத்து வரியை 1வது பார்ட்டியும், தொழில் வரியை 2வது பார்ட்டியும் செலுத்திக் கொள்ள வேண்டியது.

6. இந்த குத்தகை சொத்துக்களை 2வது பார்ட்டி வேறு நபருக்கு மாற்றம் செய்யவோ கட்டிடம் கட்டவோ சிறிதும் உரிமையில்லை.

இந்தபடிக்கு நாமிரு பார்ட்டிகளும் சேர்ந்து சம்மதித்து ஏற்படுத்திக் கொண்ட குத்தகை உடன்படிக்கை ஆவணம்.

#### சொத்து விவரம்

திருவண்ணாமலை மாவட்டம், வெம்பாக்கம் வட்டம், செய்யார் பத்திரப் பதிவு மாவட்டம், தூசி சார்பதிவாளர் அலுவலக எல்லைக்குட்பட்ட பழைய எண். 122, புதிய எண். 76 குண்டியாந்தண்டலம் கிராமத்தில் 1வது பார்ட்டியின் பெயரில் எண். 674, 918, 919 தனிப்பட்டாக்களில் அடங்கிய புஞ்சை சர்வே எண்கள்.

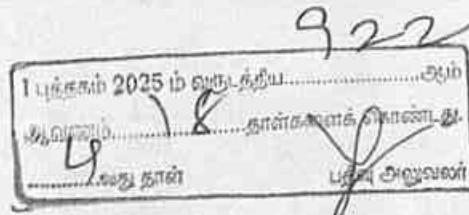
|        |                                              |
|--------|----------------------------------------------|
| 162/1  | - 0.11.00 ஏர்ஸ் ஏக்கர் 0.27 செண்ட் முழுவதும் |
| 162/2A | - 0.07.00 ஏர்ஸ் ஏக்கர் 0.17 செண்ட் முழுவதும் |
| 162/2B | - 0.02.50 ஏர்ஸ் ஏக்கர் 0.06 செண்ட் முழுவதும் |
| 162/3  | - 0.16.00 ஏர்ஸ் ஏக்கர் 0.39 செண்ட் முழுவதும் |
| 162/4  | - 0.20.00 ஏர்ஸ் ஏக்கர் 0.50 செண்ட் முழுவதும் |
| 162/5A | - 0.10.50 ஏர்ஸ் ஏக்கர் 0.26 செண்ட் முழுவதும் |
| 162/5B | - 0.07.00 ஏர்ஸ் ஏக்கர் 0.17 செண்ட் முழுவதும் |

2வது பார்ட்டி

K. I. An

1வது பார்ட்டி

K. Murthy



[illegible]



சொத்தானது நீர்நிலை பகுதியில் அமையப்பெறவில்லை என்பதற்கான காரணம்

சான்று / உறுதிமொழி (Declaration) (நீதிப்பேராணை

எண்: 22163/2018 - ல் வழங்கப்பட்ட தீர்ப்புரையை காண்க)

இந்த ஆவணத்தில் கண்ட சொத்தானது நீர்நிலைகள், நீர்வழிப் பாதைகள், நீர் பிடிப்பு பகுதிகளில் கட்டுப்படவில்லை என சான்றளிக்கின்றோம். மேலும் இதனில் தங்களுக்கு தவறான தகவல் அல்லது சான்று அளிக்கப்பட்டதாக பின்னாளில் கண்டுபிடிக்கப்பட்டால் அதனால் நாங்கள் சட்டப்பூர்வ நடவடிக்கைகளுக்கு உட்படுத்தப்படுவோம் என்பதையும் அறிவோம்.

வழக்கிடை ஆவண சொத்து பதிவுசட்டம் 1908 பிரிவு 22(A) மற்றும் பிரிவு 22(B) - க்கு உட்பட்டதல்ல எனவும், ஆவணத்துடன் இணைக்கப்பட்ட அனைத்து ஆவணங்களும் இந்திய தண்டனை சட்டம் 1860 பிரிவு 470 - ன்படி Forged Document அல்ல எனவும், ஆவணத்தை எழுதிப்பெறுபவர் அனைத்து ஆவணங்களையும் பரிசீலித்து வில்லங்கம் சரிபார்த்து எழுதிபெறுகின்றார் எனவும், சொத்து மாற்றுச்சட்டம் 1882-இன்படி சொத்து பரிமாற்றம் தொடர்பான அனைத்து பிரிவுகளுக்கும் உட்பட்டு செயல்பட்டுள்ளோம் எனவும் உறுதிமொழி அளிக்கின்றோம்.

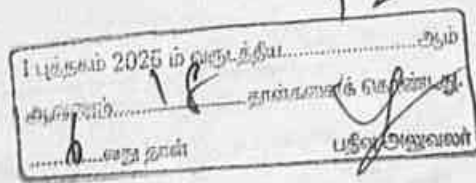
மேலும் இதனில் தங்களுக்கு தவறான தகவல்கள் அல்லது சான்று அளிக்கப்பட்டதாக பின்னால் கண்டுபிடிக்கப்பட்டால் அதற்கு நாங்கள் மட்டுமே பொறுப்பு ஆவோம் எனவும், இதற்கு சார்பதிவாளர் எவ்விதத்திலும் பொறுப்பாக மாட்டார் எனவும் உறுதிமொழி அளிக்கின்றோம்.

2வது பார்ட்டி

K. Kan.

1வது பார்ட்டி

K. Moorthy





இந்திய அரசாங்கம்  
Government of India

க மூர்த்தி  
K Moorthy

பிறந்த நாள் / DOB: 25/05/1980  
ஆண் / MALE

4208 3726 7768

எனது ஆதார், எனது அடையாளம்

Unique Identification Authority of India

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आयकर विभाग  
INCOME TAX DEPARTMENT  
K KUMAR

भारत सरकार  
GOVT. OF INDIA

KANNAIYAN

20/05/1974  
Permanent Account Number  
BGMPK4568C

K. Kannaiyan

Signature

इस कार्ड के बारे में / परने पर कृपया सुनिश्चित करें / नोट करें  
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लाने के लिए, कृपया निम्न  
कोटि निर्देशों का पालन करें  
कोल, पुणे - 411 045

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3rd Floor, Sapphire Chambers,  
Near Banner Telephone Exchange,  
Baner, Pune - 411 045

Tel: 91-20-2721 8080, Fax: 91-20-2721 8081  
e-mail: nsdi@nsdi.co.in

भारत सरकार  
Government of India

मुकेश कान्नायन  
Kannaiyan

पिन्डित नाल / DOB: 20/05/1974  
आण / Male

6084 4849 9670

मेरा आधार, मेरी पहचान

भारत सरकार  
Government of India

मुकेश कान्नायन  
Kannaiyan

पिन्डित नाल / DOB: 20/05/1974  
आण / Male

6084 4849 9670

K. Kannaiyan

K. Moorthy

922

पुस्तक 2025 में बांटी  
तलकाले कोनाल  
पुस्तक 2025 में बांटी



K. Kannaiyan



K. Murthy

Cr. collecting

Nirmal Chandra

922

1 புதுக்கோட்டை 2025-ம் ஆண்டு..... ஆம்

..... 18 .....  
.....  
.....  
.....



g k. kan



தமிழ்நாடு அரசு

வருவாய் மற்றும் பேரிடர் மேலாண்மைத் துறை

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

மாவட்டம்: திருவண்ணாமலை

வட்டம்: வெம்பாக்கம்

வருவாய் திராமம்: பூனைத்தாங்கல்

பட்டா எண்: 312

உரிமையாளர்கள் பெயர்

1 கண்ணிய நாயுடு

முகன்

முத்தி

| வ.எண் | புல எண்ணும் உட்பிரிவும் | நன்செய்     |             | புன்செய்    |             | மற்றவை      |             | முறிப்பு                          |
|-------|-------------------------|-------------|-------------|-------------|-------------|-------------|-------------|-----------------------------------|
|       |                         | பரப்பு      | தீர்வை      | பரப்பு      | தீர்வை      | பரப்பு      | தீர்வை      |                                   |
|       |                         | ஹெ ஏர் ரூபை | ஹெ ஏர் ரூபை | ஹெ ஏர் ரூபை | ஹெ ஏர் ரூபை | ஹெ ஏர் ரூபை | ஹெ ஏர் ரூபை |                                   |
| 1     | 117 - 12A2              |             |             | 0           | 42.00       | 02 00       |             | 2024/0103/06/457953<br>27-12-2024 |
| 2     | 144 - 1A                |             |             | 0           | 42.08       | 02 08       |             | 2024/0103/06/457953<br>27-12-2024 |
| 3     | 144 - 2                 |             |             | 0           | 40.50       | 02 00       |             | 2024/0103/06/457953<br>27-12-2024 |
|       | மொத்தம் *               | 0           | 0           | 1           | 245.80      | 06 08       | 0           |                                   |

மின்னகையெப்பம் / Digital Signature : 27-12-2024 அன்று 06:42:57 PM நேரத்தில் இடப்பட்டது

பெயர்/Name :

பதவி/ Designation: Zonal Deputy Tahsildar

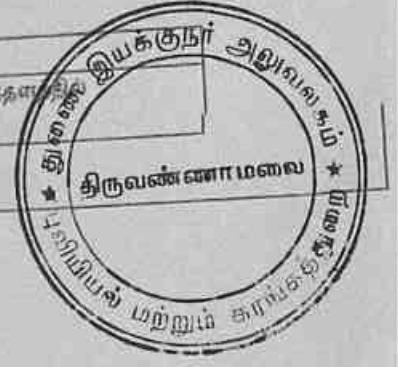
இடம்/Place : வெம்பாக்கம்(10) வட்டம்,  
திருவண்ணாமலை(06) மாவட்டம்

1 புத்தகம் 2025 ம் வருத்திய...  
ஆவணம்...  
பதிவு...  
பதிவு...

குறிப்பு  
மேற்கண்ட தகவல் / சான்றிதழ் தகவல் விவரங்கள் மின் பதிவேட்டிலிருந்து பெறப்பட்டவை என்பதை  
1 தாங்கள் <https://eservices.in.gov.in> என்று இணைய தளத்தில் 2024/0103/06/457953 என்ற முறையில்  
வண்ணம் உள்ளிடுவதற்கு உறுதி செய்துகொள்ளவும்.  
2 இத்தகவல்கள் 18-03-2025 அன்று 09:53:42 AM நேரத்தில் அச்சிடப்பட்டது.

குறிப்பு

கைப்பேசி கேமராவின் 2D barcode டிடிபான் மூலம் இத்தகவல்களை இணையத்தளத்தில்  
 சரிபார்க்கவும்



புத்தகம் 2025-ம் வருடத்திய 92-ம்  
 அட்டவணம் 18 தாள்களைக் கொண்டது  
 10 வது தாள் பதிவு அட்டவணம்





தமிழ்நாடு அரசு

வருவாய் மற்றும் பேரிடர் மேலாண்மைத் துறை

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

மாவட்டம்: திருவண்ணாமலை

வட்டம்: மேம்பாக்கம்

வருவாய் விராமம்: குண்டியார்த்தண்டலம்

பட்டி எண்: 574

உரிமையாளர்கள் பெயர்

| கண்ணையன் |                         | மகள்     |        |          |        | முர்த்தி |                                   |
|----------|-------------------------|----------|--------|----------|--------|----------|-----------------------------------|
| வ.எண்    | புல எண்ணும் உட்பிரிவும் | தன்செய்  |        | புன்செய் |        | மத்தியவை |                                   |
|          |                         | பரப்பு   | தீர்வை | பரப்பு   | தீர்வை | பரப்பு   | தீர்வை                            |
|          |                         | ஹெக்டேர் | ரூபாய் | ஹெக்டேர் | ரூபாய் | ஹெக்டேர் | ரூபாய்                            |
| 1        | 162 - 10A2              | 0        | 21.00  | 00       | 80     |          | 2020/0103/06/195376<br>22-10-2020 |
| 2        | 162 - 10B               | 0        | 34.50  | 01       | 33     |          | 2018/0103/06/083283<br>13-07-2018 |
| 3        | 162 - 9                 | 0        | 14.50  | 00       | 54     |          | 2018/0103/06/083283<br>13-07-2018 |
| 4        | 163 - 10C               | 0        | 12.00  | 00       | 46     |          | 2018/0103/06/083283<br>13-07-2018 |
| 5        | 163 - 13A               | 0        | 42.00  | 01       | 66     |          | 2021/0108/06/003753<br>25-02-2021 |
| 6        | 163 - 14A               | 0        | 83.50  | 03       | 21     |          | 2018/0103/06/083283<br>13-07-2018 |
| 7        | 181 - 1D1               | 0        | 20.50  | 00       | 54     |          | 2018/0103/06/083283<br>13-07-2018 |
| 8        | 181 - 1D2               | 0        | 09.50  | 00       | 26     |          | 2018/0103/06/083283<br>13-07-2018 |

1 புத்தகம் 2025 இல் வருடத்திய 922  
ஆவணம் 18 தாள்களைக் கொண்டது.  
11 பதிவு  
பதிவு அலுவலர்





| வ.எண் | புல எண்ணும்<br>கட்டிடத்தின் | தன்செய் |         | புன்செய் |         | மற்றவை  |         | தேதி | நேரம் | மொத்தம்                           |
|-------|-----------------------------|---------|---------|----------|---------|---------|---------|------|-------|-----------------------------------|
|       |                             | பரப்பு  | தீர்வை  | பரப்பு   | தீர்வை  | பரப்பு  | தீர்வை  |      |       |                                   |
|       |                             | மீட்டர் | மீட்டர் | மீட்டர்  | மீட்டர் | மீட்டர் | மீட்டர் |      |       |                                   |
| 9     | 181 - 1E1                   |         |         | 0        | 18.00   | 00      | 45      |      |       | 2018/0103/06/083283<br>13-07-2018 |
| 10    | 181 - 1E2                   |         |         | 0        | 08.00   | 00      | 22      |      |       | 2018/0103/06/083283<br>13-07-2018 |
| 11    | 181 - 1E3                   |         |         | 0        | 07.00   | 00      | 20      |      |       | 2018/0103/06/083283<br>13-07-2018 |
|       | மொத்தம் -                   | 0       | 0       | 2        | 70.50   | 9       | 67      | 0    | 0     |                                   |

மின்னகையெப்பம் / Digital Signature : 22-10-2020 அன்று 07:51:50 PM நேரத்தில் இடப்பட்டது

பெயர்/Name : Thulasiraman B  
பதவி/ Designation: Zonal Deputy Tahsildar

இடம்/Place : வெம்பாக்கம்(10) வட்டம்,  
திருவண்ணாமலை(06) மாவட்டம்

| குறிப்பு |                                                                                                                                                                                                                                                                           |
|----------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1        | மேற்கண்ட தகவல் / சான்றிதழ் நகல் விவரங்கள் மின் பதிவேட்டிலிருந்து பெறப்பட்டவை. இவற்றை<br>தாங்கள் <a href="https://eservices.tn.gov.in">https://eservices.tn.gov.in</a> என்ற இணைய தளத்தில் 2018/0103/06/083283 என்ற குறிப்பு<br>எண்ணை உள்வீடு செய்து உறுதி செய்துகொள்ளவும். |
| 2        | இத்தகவல்கள் 18-03-2025 அன்று 09:52:48 AM நேரத்தில் அச்சடிக்கப்பட்டது.                                                                                                                                                                                                     |
| 3        | சைப்பேசி கேமராவின் 2D barcode படிப்பான் மூலம் இத்தகவல்களை இணையத்தளத்தில்<br>சரிபார்க்கவும்.                                                                                                                                                                               |

1 புத்தகம் 2025 ம் வருடத்திய 9.2.25  
அலுவலர் 18 தாக்கவாகக் கொண்டு  
12 இது தான் பதிவு செய்யப்பட்டது



K.1.25





தமிழ்நாடு அரசு

வருவாய் மற்றும் பேரிடர் மேலாண்மைத் துறை

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

மாவட்டம்: திருவண்ணாமலை

வட்டம்: செவ்வாக்கம்

வருவாய் கிராமம்: குண்டியாந்தண்டலம்

பட்டா எண்: 919

உரிமையாளர்கள் பெயர்

| 1 | கனியைன்                 | மகன்    |        |          |        | மூர்த்தி |        |        |                                   |
|---|-------------------------|---------|--------|----------|--------|----------|--------|--------|-----------------------------------|
|   |                         | நன்செய் |        | புன்செய் |        | மற்றவை   |        |        |                                   |
|   |                         | பரப்பு  | தீர்வை | பரப்பு   | தீர்வை | பரப்பு   | தீர்வை | பரப்பு | தீர்வை                            |
|   | புல எண்ணும் உட்பிரிவும் | ஹெ      | ஏரூ    | பை       | ஹெ     | ஏரூ      | பை     | ஹெ     | ஏரூ                               |
| 1 | 162 - 10A1              |         |        |          | 0      | 49.00    | 01     | 92     |                                   |
|   |                         |         |        |          |        |          |        |        | 2024/0103/06/457952<br>10-01-2025 |
| 2 | 162 - 10A3A             |         |        |          | 0      | 25.50    | 01     | 00     |                                   |
|   |                         |         |        |          |        |          |        |        | 2024/0103/06/457952<br>10-01-2025 |
| 3 | 162 - 10A3B             |         |        |          | 0      | 03.00    | 00     | 10     |                                   |
|   |                         |         |        |          |        |          |        |        | 2025/0103/06/463765<br>03-02-2025 |
| 4 | 162 - 3                 |         |        |          | 0      | 16.00    | 00     | 61     |                                   |
|   |                         |         |        |          |        |          |        |        | 2024/0103/06/457952<br>10-01-2025 |
| 5 | 162 - 4                 |         |        |          | 0      | 20.00    | 00     | 76     |                                   |
|   |                         |         |        |          |        |          |        |        | 2024/0103/06/457952<br>10-01-2025 |
| 6 | 162 - 5A                |         |        |          | 0      | 10.50    | 00     | 40     |                                   |
|   |                         |         |        |          |        |          |        |        | 2024/0103/06/457952<br>10-01-2025 |
| 7 | 162 - 5B                |         |        |          | 0      | 07.00    | 00     | 27     |                                   |
|   |                         |         |        |          |        |          |        |        | 2024/0103/06/457952<br>10-01-2025 |
| 8 | 162 - 7                 |         |        |          | 0      | 11.50    | 00     | 44     |                                   |
|   |                         |         |        |          |        |          |        |        | 2024/0103/06/457952<br>10-01-2025 |

1 புத்தகம் 2025 ம் வருடத்தில் 922  
பதிவு செய்யப்பட்டுள்ளது.  
13.18 தாள்சுரைகள் கைப்பாட்டு.  
பதிவு அலுவலர்

K. I. Ram.

| ப.எண் | புல எண்ணும்<br>உபபிரிவும் | தஞ்சை  |        | புச்சை |        | மதுரை  |        |
|-------|---------------------------|--------|--------|--------|--------|--------|--------|
|       |                           | பரப்பு | தீர்வை | பரப்பு | தீர்வை | பரப்பு | தீர்வை |
|       |                           |        |        |        |        |        |        |
| 9     | 162-8                     |        | 0      | 22.00  | 00.84  |        |        |
|       | மொத்தம் -                 | 0      | 0      | 1      | 64.50  | 6 34 0 | 0      |

திருவண்ணாமலை

03/06/457952

புலியாறு

மற்றும

பின்புலச்சொப்பம் / Digital Signature : 03-02-2025 அன்று 07:47:54 PM நேரத்தில் இடப்பட்டது

Quizz Name : Vadivel A

பதவி/ Designation: Head Quarters Deputy Tahsildar

இடம்/Place : வெம்பாக்கம்(10) வட்டம்.

திருவண்ணாமலை(06) மாவட்டம்

|          |                                                                                                                                                                                                                                                                                    |
|----------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| குறிப்பு | மேற்கண்ட தகவல் / சான்றிதழ் தகவல் விவரங்கள் பின் பதிவேட்டிலிருந்து பெறப்பட்டவை. இவற்றை<br>1. தாங்கள் <a href="https://esservices.in.gov.in">https://esservices.in.gov.in</a> என்ற இணைய தளத்தில் 2024/01/03/06/457952 என்ற குறியீடு<br>எண்ணை உள்ளிட்டு செய்து உறுதி செய்துகொள்ளவும். |
| 2.       | இத்தகவல்கள்: 18-03-2025 அன்று 09:52:01 AM நேரத்தில் அச்சடிக்கப்பட்டது.                                                                                                                                                                                                             |
| 3.       | எகப்பேசி கோரலின் 2D barcode படிப்பாள் மூலம் இத்தகவல்களை இணையத்தளத்தில்<br>சரிபார்க்கவும்.                                                                                                                                                                                          |

1 புதுதலை 2025 ம் வருஷம் 927  
 14 தாள்களில் 18 தாள்களில் உபயோகம்  
 14 தாள்கள் 1 புதுதலை





தமிழ்நாடு அரசு

வருவாய் மற்றும் பேரிடர் மேலாண்மைத் துறை

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

மாவட்டம்: திருவண்ணாமலை

வட்டம்: வெம்பாக்கம்

வருவாய் கிராமம்: குண்டியாந்தண்டலம்

பட்டா எண்: 918

உரிமையாளர்கள் பெயர்

1 கன்னையா நாயுடு

மகள்

முரத்தி

| வ.எண் | புல எண்ணும் உட்பிரிவும் | நன்செய் |        | புன்செய் |        | மற்றவை |        |        |        | குறிப்பு                          |
|-------|-------------------------|---------|--------|----------|--------|--------|--------|--------|--------|-----------------------------------|
|       |                         | பரப்பு  | தீர்வை | பரப்பு   | தீர்வை | பரப்பு | தீர்வை | பரப்பு | தீர்வை |                                   |
|       |                         | ஹெ.ஏர்  | ரூ.பை  | ஹெ.ஏர்   | ரூ.பை  | ஹெ.ஏர் | ரூ.பை  | ஹெ.ஏர் | ரூ.பை  |                                   |
| 1     | 162 - 1                 |         |        | 0        | 11.00  | 00     | 42     |        |        | 2024/0103/06/457950<br>27-12-2024 |
| 2     | 162 - 2A                |         |        | 0        | 07.00  | 00     | 27     |        |        | 2024/0103/06/457950<br>27-12-2024 |
| 3     | 162 - 2B                |         |        | 0        | 02.50  | 00     | 09     |        |        | 2024/0103/06/457950<br>27-12-2024 |
| 4     | 162 - 6                 |         |        | 0        | 08.00  | 00     | 31     |        |        | 2024/0103/06/457950<br>27-12-2024 |
|       | மொத்தம் -               | 0       | 0      | 0        | 28.50  | 1      | 09     | 0      | 0      |                                   |

மின்கையெப்பம் / Digital Signature : 27-12-2024 அன்று 06:38:45 PM நேரத்தில் இடப்பட்டது

பெயர்/Name :

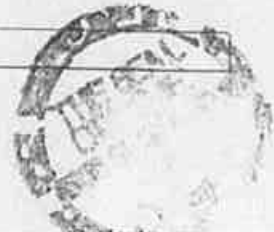
பதவி/ Designation: Zonal Deputy Tahsildar

இடம்/Place : வெம்பாக்கம்(10) வட்டம்,

திருவண்ணாமலை(06) மாவட்டம்

குறிப்பு

புத்தரம் 2025 ம் வருடத்திய.....  
சுருவணம்.....  
15/12/2024 தாள்  
பதிவு அலுவலர்



குறிப்பு

1. மேற்கண்ட தகவல் / சான்றிதழ் நகல் விவரங்கள் மின் பதிவேட்டிலிருந்து பெறப்பட்டவை இவற்றை உறுதிப்படுத்தும் இலாகாவை உள்விட்டு செப்து உறுதி செய்துகொள்ளவும்.
2. இத்தகவல்கள் 18-03-2025 அன்று 09:51:10 AM தேர்தலில் அச்சடிக்கப்பட்டது.
3. எகப்பேசி கேமராவின் 2D barcode படிப்பான் மூலம் இத்தகவல்களை இணையத்தளத்தில் சரிபார்க்கவும்.



16/03/2025 ம் வருடம் 925  
16/18 நாள்வரைக் கொண்டது  
பதிவு செய்யப்பட்டது  
சுறு நான்



விதர்ப்புத்தகம்-1/922/2025



மேலும் துண்டு இறுதிய முத்திரை கட்டம் எவது பிரிவின கீழான

மேலும் துண்டு வரிசை எண் 111

2025 மண்டலம் கூட்டுறவு ஆர்ப்பாக்கம் வானாறுவாத காஞ்சிபுரம் தமிழ்நாடு இத்தியம் 1/922/2025 என்பவரிடமிருந்து 1/2/2025 ரூபாய் திரண்டாவிர்த்து நூறு மட்டும் இந்த ஆவணத்திற்காக இத்தியம் 1/922/2025 கட்டம் எவது பிரிவின 111 குறைவாயிருந்த முத்திரைக் கட்டணம் வசூலிக்கப்பட்டது என நான் இதன் மூலம் அங்கீகரிக்கிறேன்

சார்பதிவாளர் துதி  
நாள் 18/05/2025

சார்பதிவாளர் மற்றும் இத்திய முத்திரைத் துதி  
என் படி ஆட்சியர்

சார்பதிவாளர்  
துதி

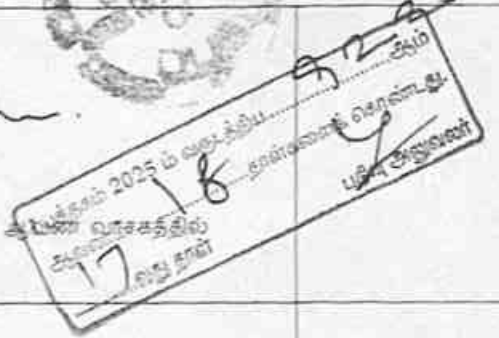
2025 ஆம் ஆண்டு மார்ச் மாதம் 15ம் தேதி 05:11:42 மணியளவில் துதி சார்பதிவாளர் அலுவலகத்தில் நாக்கல் செய்து கட்டணம் 1/2/2025 செலுத்தியவர்

இடது பெருவிரல்



K. Kan.

கூடுதல் விவரங்கள் துதி வரிசைகளில்  
உள்ளபடி



வலது கை கொடுத்ததாக ஒப்பக் கொண்டவர்  
இடது பெருவிரல்



K. Kan.

"சம்மதத்துடன் கூடிய ஆதார் அங்கீகாரம்" என்று வழி இந்த நபரின் அடையாளம் விரல் ரேகை மூலம் ஆதார் ஆணையத்துடன் சரிபார்க்கப்பட்டது ஒப்பிட்டு எண்  
UKC:5529963890990b401e41cb9a46a70ae20903287  
(Details from UIDAI) : K. Moorthy S/O, Kannaiyan, 25-05-1980, xxxxxxxx7768)



வலது வங்கியைக் கொடுத்ததாக ஒப்பக் கொண்டவர்  
இடது பெருவிரல்



K. Kan.

"சம்மதத்துடன் கூடிய ஆதார் அங்கீகாரம்" என்று வழி இந்த நபரின் அடையாளம் விரல் ரேகை மூலம் ஆதார் ஆணையத்துடன் சரிபார்க்கப்பட்டது ஒப்பிட்டு எண்  
UKC:0021145b2d179861e48485e95a198eef179f507  
(Details from UIDAI) : Kumar Kannaiyan S/O Kannaiyan, 20-



K. Kan.

R/தூசி/புத்தகம்-1/922/2025

05-1974, XXXXXXXX96701



2025 ஆம் ஆண்டு மார்ச் மாதம் 18ம் நாள்

சார்பதிவாளர்  
தூசி

R/தூசி/புத்தகம்-1/922/2025 எண்ணாகப் பதிவு செய்யப்பட்டது

நாள் 18/03/2025

தூசி

சார்பதிவாளர்  
தூசி



922  
1 புத்தகம் 2025 ம் வருடத்திய.....ஆம்  
ஆவணம்.....18.....தாள்களைக் கொண்டது.  
.....18 வது தாள் பதிவு செய்யப்பட்டது





### PHOTOCOPY OF THE APPLIED LEASE AREA

Site photos in respect of Rough stone and gravel quarry lease in S.No.s: 162/1, 162/2A, 162/2B, 162/3, 162/4, 162/5A, 162/5B, 162/6, 162/7, 162/8, 162/10A1, 162/10A2, 162/10A3A, 162/10A3B and 117/12A2, 144/1A, 144/2Patta Land, an extent of 0.69.0 hectares – Kundiyathandalam & Poonathangal village – Vembakkam Taluk – Tiruvannamalai District, Tamil Nadu State in belongs to M/s.Sri Kanniammal Blue Metals.





Government of India

Form GST REG-06

[See Rule 10(1)]

## Registration Certificate

Registration Number :33BGMPK4568C1ZE

|                                                                                                                              |                                        |                                                                                      |            |                                                                                       |                |
|------------------------------------------------------------------------------------------------------------------------------|----------------------------------------|--------------------------------------------------------------------------------------|------------|---------------------------------------------------------------------------------------|----------------|
| 1.                                                                                                                           | Legal Name                             | KANNAIYAN KUMAR                                                                      |            |                                                                                       |                |
| 2.                                                                                                                           | Trade Name, if any                     | SRI KANNIAMMAL BLUE METALS                                                           |            |                                                                                       |                |
| 3.                                                                                                                           | Additional trade names, if any         |                                                                                      |            |                                                                                       |                |
| 4.                                                                                                                           | Constitution of Business               | Proprietorship                                                                       |            |                                                                                       |                |
| 5.                                                                                                                           | Address of Principal Place of Business | SF NO.660/1B, ARPAKKAM VILLAGE, WALAJABAD, Arpakam, Kancheepuram, Tamil Nadu, 631603 |            |                                                                                       |                |
| 6.                                                                                                                           | Date of Liability                      |                                                                                      |            |                                                                                       |                |
| 7.                                                                                                                           | Date of Validity                       | From                                                                                 | 11/04/2023 | To                                                                                    | Not Applicable |
| 8.                                                                                                                           | Type of Registration                   | Regular                                                                              |            |  |                |
| 9.                                                                                                                           | Particulars of Approving               | Centre Goods and Services Tax Act, 2017                                              |            |                                                                                       |                |
| Signature                                                                                                                    |                                        | Validity<br>Unknown validity<br>AND SERVICE<br>UNKNOWN<br>Date: 2023.05.25 10:38 IST |            |                                                                                       |                |
| Name                                                                                                                         |                                        | Sankar Gopalakrishnan                                                                |            |                                                                                       |                |
| Designation                                                                                                                  |                                        | Superintendent                                                                       |            |                                                                                       |                |
| Jurisdictional Office                                                                                                        |                                        | KANCHEEPURAM - RURAL                                                                 |            |                                                                                       |                |
| Date of issue of Certificate                                                                                                 |                                        | 25/05/2023                                                                           |            |                                                                                       |                |
| Note: The registration certificate is required to be prominently displayed at all places of Business/Office(s) in the State. |                                        |                                                                                      |            |                                                                                       |                |

This is a system generated digitally signed Registration Certificate issued based on the approval of application granted on 25/05/2023 by the jurisdictional authority.





Goods and Services Tax Identification Number: 33BGMPK4568C1ZE

Details of Additional Place of Business(s)

Legal Name KANNAIYAN KUMAR  
Trade Name, if any SRI KANNIAMMAL BLUE METALS  
Additional trade names, if any

Total Number of Additional Places of Business(s) in the State 0

K. K. Kain



सत्यमेव जयते



Goods and Services Tax Identification Number: 33BGMPK4568C1ZE

Legal Name KANNAIYAN KUMAR  
Trade Name, if any SRI KANNIAMMAL BLUE METALS  
Additional trade names, if any

Details of Proprietor

1



Name KANNAIYAN KUMAR  
Designation/Status PROPRIETOR  
Resident of State Tamil Nadu

*K. Kan*



भारत सरकार  
Government of India

जामिन

कुमार कन्नियन  
Kumar Kanniyar  
பிறந்த நாள் / DOB : 20/05/1974  
ஆண் / Male

जम्मा रूपाका का प्रमाण है, नागरिकता का नहीं।  
Aadhaar is a proof of identity, not of citizenship.

6084 4849 9670

मेरा आधार, मेरी पहचान

335- ANNEXURE -IV

भारतीय विशिष्ट पहचान प्राधिकरण  
Tamil Nadu State Government

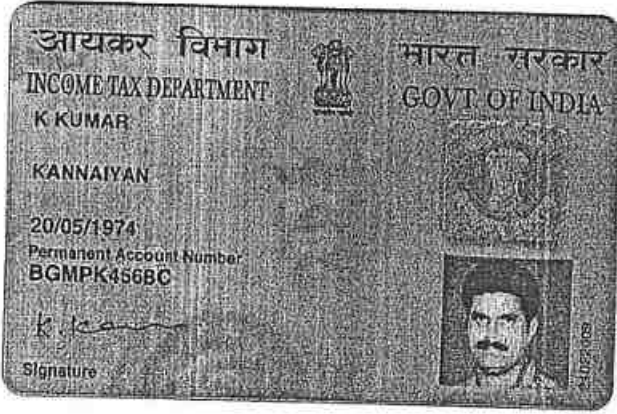
முகவரி: S/O கன்னையன், எண் 232,  
மண்டபம், ஆற்பாக்கம், காஞ்சிபுரம்  
தமிழ்நாடு: 631603

Address: S/O Kanniyar, NO 232,  
MANDAPAM, Arpakkam,  
Kancheepuram, Tamil Nadu, 631603

6084 4849 9670

1947 | help@uidai.gov.in | www.uidai.gov.in

K. Kan.



K. Kan

Reg. No. 03BBH1007  
Col Code 013 / 196



பெரியார் பல்கலைக்கழக ஆட்சிக்குழு 2005 ஆம் ஆண்டு ஏப்ரல் மாதம்  
நடந்த பயன்பாட்டு புவியமைப்பியல் தேர்வில்  
S கருப்பண்ணன் என்பவர்  
தனிச்சிறப்புடன் முதல் வகுப்பில் தேர்ச்சி பெற்றார் என்று தக்க  
தேர்வாளர்கள் சான்றளித்தபடி அறிவியல் நிறைஞர்  
என்னும் பட்டத்தை அவருக்குப் பல்கலைக்கழக இலச்சினைபுடன் வழங்குகிறது.

*The Syndicate of the Periyar University hereby makes known*  
*that* **KARUPPANNAN S** *has been*  
*admitted to the* **DEGREE OF MASTER OF SCIENCE in**  
**APPLIED GEOLOGY**  
*he/she having been certified by duly appointed Examiners to be qualified*  
*to receive the same and was placed in the* **FIRST CLASS WITH DISTINCTION**  
*at the Examination held in* **APR-2005**



Given under the seal of this university

IAC No. 142 / TNGST. No. 2702141  
CST No. 704829 / SLM / Dt. 7-4-99



## BALAJI MINES

Proprietor : E. SANTHARAMAN,  
PURITY LIME STONE SUPPLIERS,  
5/88, CHINNAGOLLAPATTI, KANNANKURICHI P. O.,  
SALEM-636 008, Tamil Nadu.



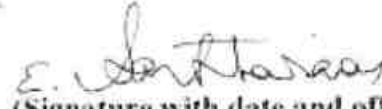
Mines : Devar Malai Village, Kulithalai Tk., KARUR Dt. (Via) Korur to Palayam.

Date 15-10-2010

### EXPERIENCE CERTIFICATE

I E.SANTHARAMAN being the Managing Director of BALAJI MINES do hereby certify that Thiru. S.KARUPPANNAN, son of T.SUNDARAM (Whose signature is appended) worked as a Geologist in Balaji Mine, Devar malai village, kulithalai Taluk, Karur District, from 01.06.2005 to 10.10.2010. During his term of work aforesaid, he has obtained practical experience as detailed overleaf. The duties connected with his work have involved his continuous attendance at the mine, and have been efficiently performed by him.

I believe him to be of good character and a fit and proper person to be examined for Certificate of Competency.

  
(Signature with date and official Seal)

TIN No: 33852702141  
CST No: 704829 / 7-4-99  
**BALAJI MINES**  
5/88, Chinnagollapatty,  
Kannankurichi (P.O), SALEM-8.

  
(Signature of Candidate)





K. PLAKS SUNDARAM  
Cell : 94876 33359

**SRI RAMAJAYAM  
GRANITES**

731, Krishnagin Main Road, Opp. E.B. Office, MATHUR - 636 203.  
email : sriamajayamgranites@gmail.com

-343-

K. PLAKS SUNDARAM  
Cell : 94876 33359  
04318\* 44321



Date: 11/10/2011

### EXPERIENCE CERTIFICATE

This is to certify that Mr. Karuppannan Sundaram has been worked as a "Senior Geologist" in our company from 11<sup>th</sup> October 2010 to 11<sup>th</sup> October 2011. During this period, he has been involved in the Quality Control for Granite block extraction from quarry. Involvement of his work is highly appreciated and have been efficiently worked in our company. The duties connected with his work have been continuous attendance at the quarry.

I wish him all the best in all his future endeavors.

For SRI RAMAJEYAM GRANITES

K. P. Sundaram  
Proprietor

11/10/2011

Attested /  
K. Sundaram  
18/10/2011

**DEPUTY DIRECTOR  
DEPARTMENT OF GEOLOGY AND MINING  
DHARMAPURI**

K. Kan.

TOWNSHIP  
Kancheepuram



## PLATE No-I

### APPLICANT:

M/s.SRI KANNIAMMAL BLUE METALTS,  
PROPRIETOR, Mr.K.KUMAR  
S/O.KANNAIYAN,  
S.No.660/2A, 2B, 2C, 2D, 660/2A, 1B,  
A.ARPAKKAM VILLAGE,  
WALAJABAD TALUK,  
KANCHEEPURAM DISTRICT.



LEASE APPLIED AREA  
S.F.No : 162/1, 162/2A, 162/2B, 162/3, 162/4,  
162/5A, 162/5B, 162/6, 162/7, 162/8,  
162/10A1, 162/10A2, 162/10A3A,  
162/10A3B & 117/12A2, 144/1A, 144/2

EXTENT : 3.38.58Hect

VILLAGE : KUNDIYATHANDALAM &  
POONATHANGAL

TALUK : VEMBAKKAM,

DISTRICT : TIRUVANNAMALAI.

### INDEX

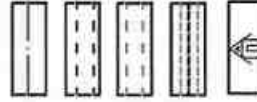
MINE LEASE AREA

APPROACH ROAD

VILLAGE ROAD

SH - 118A & 116 ROAD

HABITATION



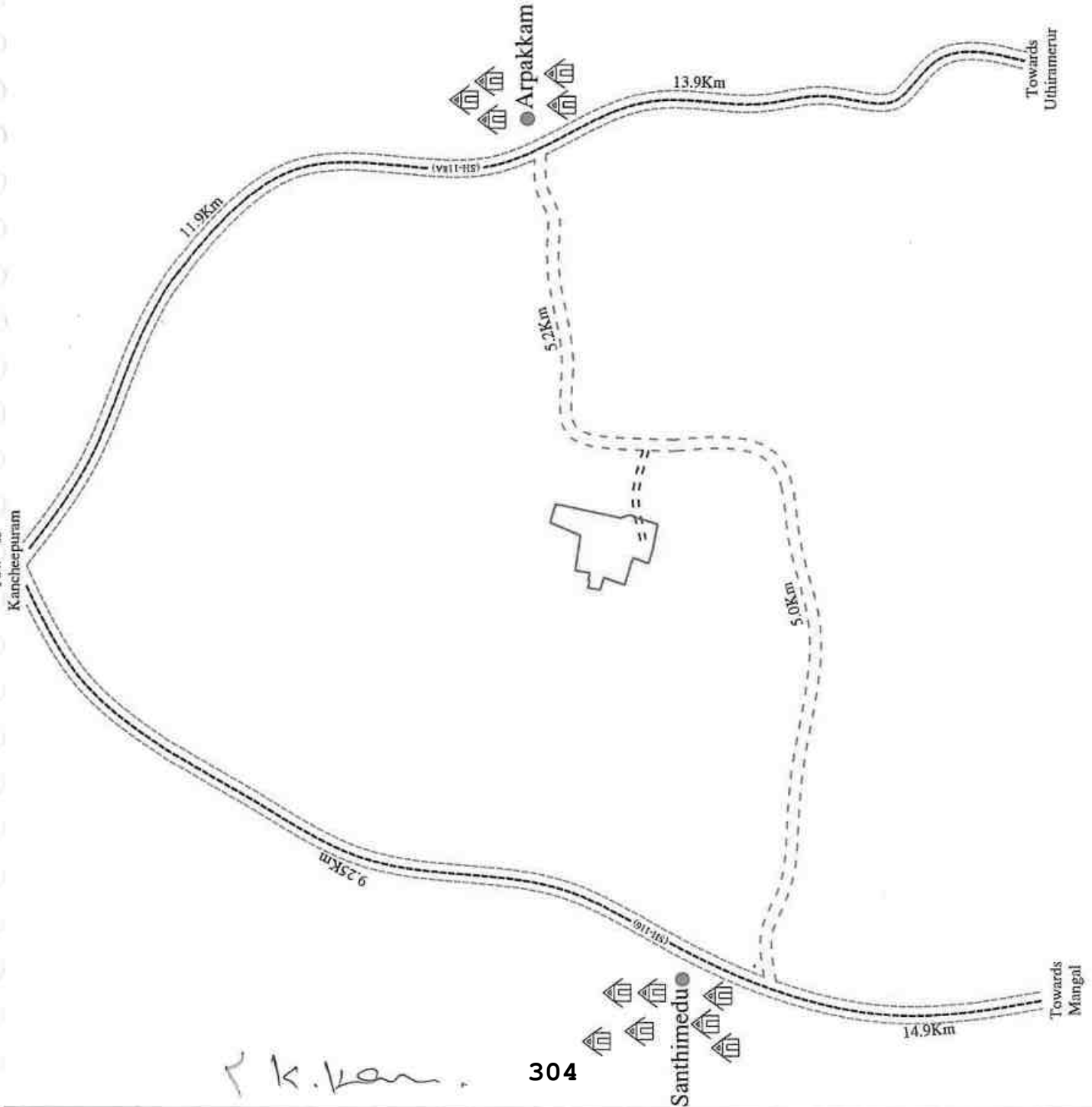
## KEY MAP

Not to Scale

Prepared By:

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

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





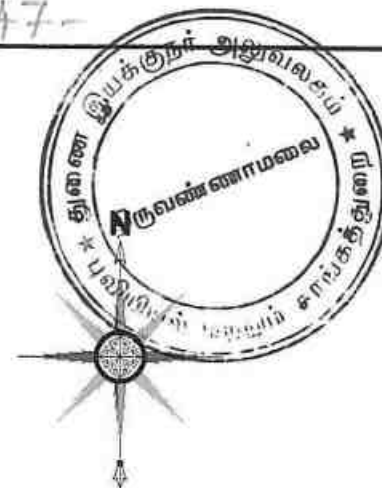


PLATE No-IA

APPLICANT:

M/s.SRI KANNIAMMAL BLUE METALS,  
PROPRIETOR, Mr.K.KUMAR  
S/O.KANNAIYAN,  
S.No.660/2A, 2B, 2C, 2D, 660/1A, 1B,  
AARPAKKAM VILLAGE,  
WALAJABAD TALUK,  
KANCHEEPURAM DISTRICT.

LEASE APPLIED AREA:

S.F.No : 162/1, 162/2A, 162/2B, 162/3, 162/4,  
162/5A, 162/5B, 162/6, 162/7, 162/8,  
162/10A1, 162/10A2, 162/10A3A,  
162/10A3B & 117/12A2, 144/1A, 144/2  
EXTENT : 3.38.58Hect  
VILLAGE : KUNDIYATHANDALAM &  
POONATHANGAL  
TALUK : VEMBAKKAM,  
DISTRICT : TIRUVANNAMALAI

INDEX

MINE LEASE AREA : ●

TOPO SHEET NO : 57-P/10

LATITUDE : 12°43'59.10"N to 12°44'8.20"N

LONGITUDE : 79°42'55.27"E to 79°43'2.53"E

LOCATION PLAN

NOT TO SCALE

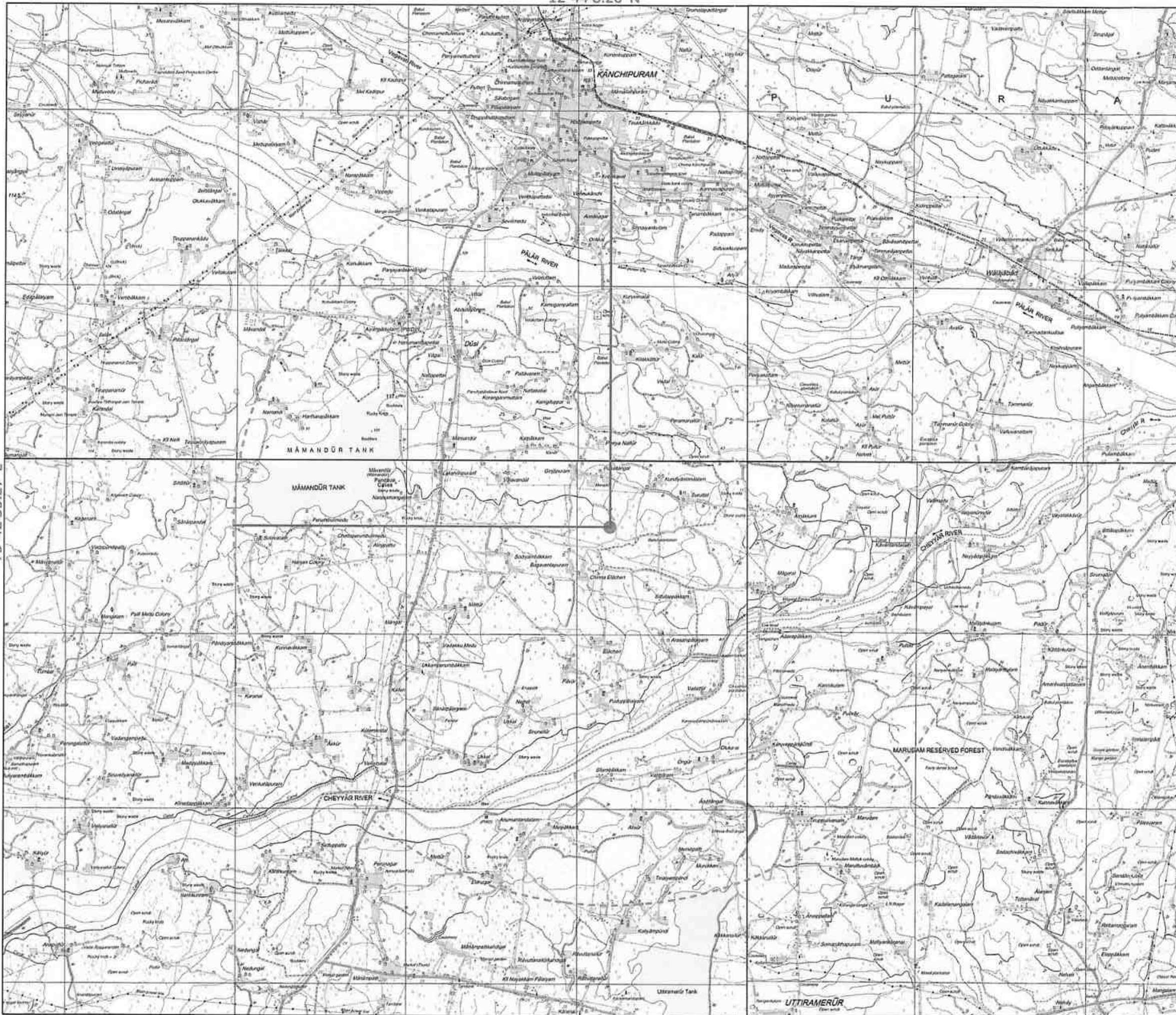
Prepared By:

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

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



12°44'8.20"N



79°42'55.27"E

PLATE No-IB

APPLICANT

M/s.SRI KANNIAIMAL BLUE METALS,  
PROPRIETOR: M.K.KUMAR  
S/O.KANNIAIMAL,  
S.No.660/2A, 2B, 2C, 660/1A, 1B,  
AARPAKKAM VILLAGE,  
WALAJABAT TALUK,  
KANCHEEPURAM DISTRICT.

LEASE APPLIED AREA

S.F.No : 162/1, 162/2A, 162/2B, 162/3, 162/4,  
162/5A, 162/5B, 162/6, 162/7, 162/8,  
162/10A1, 162/10A2, 162/10A3A,  
162/10A3B & 117/12A2, 144/1A, 144/2

EXTENT : 3.38.58Hect  
VILLAGE : KUNDIYATHANDALAM &  
POONATHANGAL

TALUK : VEMBAKKAM,  
DISTRICT : TIRUVANNAMALAI.

TOPO SHEET No : 57-P/10

LATITUDE : 12°43'59.10"N to 12°44'8.20"N

LONGITUDE : 79°42'55.27"E to 79°43'2.53"E

MINE LEASE AREA

10KM RADIUS

CONVENTIONAL SYMBOLS

|                                                                         |  |
|-------------------------------------------------------------------------|--|
| Express highway with toll with bridge with distance scale               |  |
| Roads, metalled, according to importance                                |  |
| Roads, double carriageway, according to importance                      |  |
| Unmetalled road, Cart track, Pack track with pass, Foot path            |  |
| Canals, with brick in bed, unlined, Canal                               |  |
| Dams, masonry or rock-filled, earthen, Weir                             |  |
| River, dry with water channel, with island & rocks, Tidal river         |  |
| Submerged rocks, Shoal, Swamp, Rapids                                   |  |
| Wells, lined, unlined, Tube-well, Spring, Tanks, perennial, dry         |  |
| Embankments, road or rail, tank, Broken ground                          |  |
| Highways, bridge gauge, double, single with station, under construction |  |
| Highways, other gauges, double, single with distance scale, do          |  |
| Mineral line or railway, K.M. Cutting with tunnel                       |  |
| Contours with sub-features, Rocky slopes, Cliffs                        |  |
| Land features: (Flat, (2)and-hill(permanent), (3)and-hill(permanent)    |  |
| Towns or Villages inhabited, deserted, Fort                             |  |
| Huts, permanent, temporary, Towers, Ancestral                           |  |
| Temples, Church, Mosque, high, Tams, Graves                             |  |
| Lighthouse, Lightship, Buoy, Lighted, unlighted, Anchorage              |  |
| Mine, Vene on brim, Grass, Scrub                                        |  |
| Palms, papyrus, other, Plantain, Conifer, Bamboo, Other trees           |  |
| Areas, cultivated, wooded, Surveyed trees                               |  |
| Boundary, international                                                 |  |
| State, demarcated, undemarcated                                         |  |
| district, sub-division, taluk or Tahsil, forest                         |  |
| Boundary pillars, surveyed, unsurveyed                                  |  |
| Height, triangulated, station, point, approximate                       |  |
| Bench mark, geodetic, tertiary, canal                                   |  |
| Post office, Telegraph office, Overhead tank                            |  |
| Rest house or inspection bungalow, Cessal house, Police station         |  |
| Camping ground, Forest, reserved, protected                             |  |
| Spaced names, administrative, locally or tribal                         |  |
| Hospital, Dispensary, Veterinary, Hospital / Dispensary                 |  |
| Aerodrome, Helipad, Tourist site                                        |  |
| Power line, with pylons surveyed, with poles unsurveyed                 |  |

TOPOSHEET MAP

SCALE- 1:1,00,000

Prepared By:

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

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



12°44'8.20"N

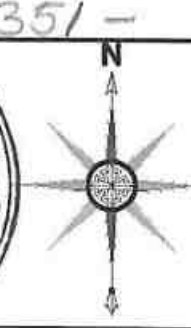
Towards  
Poonathangal

PLATE NO. IC

APPLICANT

M/s.SRI KANNIAMMAL BLUE METALS,  
PROPRIETOR, Mr.K.KUMAR  
S/O.KANNAIYAN,  
S.No.660/2A, 2B, 2C, 2D, 660/1A, 1B,  
AARPAKKAM VILLAGE,  
WALAJABAD TALUK,  
KANCHEEPURAM DISTRICT.

LEASE APPLIED AREA:

S.F.No :162/1, 162/2A, 162/2B, 162/3, 162/4,  
162/5A, 162/5B, 162/6, 162/7, 162/8,  
162/10A1, 162/10A2, 162/10A3A,  
162/10A3B & 117/12A2, 144/1A, 144/2

EXTENT : 3.38.58Hect

VILLAGE : KUNDIYATHANDALAM &  
POONATHANGAL

TALUK : VEMBAKKAM,

DISTRICT : TIRUVANNAMALAI.

INDEX

MINE LEASE AREA



SAFETY DISTANCE



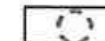
APPROACH ROAD



VILLAGE ROAD



100m RADIUS



200m RADIUS



300m RADIUS



400m RADIUS



500m RADIUS



EXISTING PIT



ERI



TOPO SHEET NO : 57-P/10

LATITUDE : 12°43'59.10"N to 12°44'8.20"N

LONGITUDE : 79°42'55.27"E to 79°43'2.53"E

SATELITE IMAGERY MAP

SCALE- 1:5000

Prepared By:

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

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



79°42'55.27"E

Towards  
Santhimedu



PLATE NO: ID

APPLICANT:

M/s. SRI KANNAMMAL BLUE METALS,  
 PROPRIETOR: M. K. KUMAR  
 S/O. KANNAIYAN,  
 S.No. 660/2A, 2B, 2C, 2D, 660/1A, 1B,  
 AARPAKKAM VILLAGE,  
 WALAJABAD TALUK,  
 KANCHEEPURAM DISTRICT.

LEASE APPLIED AREA:

S.F.No : 162/1, 162/2A, 162/2B, 162/3, 162/4,  
 162/5A, 162/5B, 162/6, 162/7, 162/8,  
 162/10A1, 162/10A2, 162/10A3A,  
 162/10A3B & 117/12A2, 144/1A, 144/2  
 EXTENT : 3.38.58 Hect  
 VILLAGE : KUNDIYATHANDALAM &  
 POONATHANGAL  
 TALUK : VEMBAKKAM,  
 DISTRICT : TIRUVANNAMALAI.

## INDEX

MINE LEASE AREA



SAFETY DISTANCE



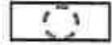
APPROACH ROAD



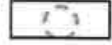
VILLAGE ROAD



100m RADIUS



200m RADIUS



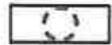
300m RADIUS



400m RADIUS



500m RADIUS



EXISTING PIT



SHRUBS &amp; TREES



WIND DIRECTION



ERI



TOPO SHEET NO : 57-P/10

LATITUDE : 12°43'59.10"N to 12°44'8.20"N

LONGITUDE : 79°42'55.27"E to 79°43'2.53"E

ENVIRONMENTAL PLAN

SCALE- 1:5000

Prepared By:

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

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

12°44'8.20"N

OCTOBER TO DECEMBER

Towards  
Poonathangal

79°42'55.27"E

Towards  
Santhimedu

JULY TO SEPTEMBER

K. Kan.



| S.No  | Village           | S.F.No    | Extent in (Hect) |
|-------|-------------------|-----------|------------------|
| 1     | Kundiyanthandalam | 162/1     | 0.11.00          |
| 2     |                   | 162/2A    | 0.07.00          |
| 3     |                   | 162/2B    | 0.02.50          |
| 4     |                   | 162/3     | 0.16.00          |
| 5     |                   | 162/4     | 0.20.00          |
| 6     |                   | 162/5A    | 0.10.50          |
| 7     |                   | 162/5B    | 0.07.00          |
| 8     |                   | 162/6     | 0.08.00          |
| 9     |                   | 162/7     | 0.11.50          |
| 10    |                   | 162/8     | 0.22.00          |
| 11    |                   | 162/10A1  | 0.49.00          |
| 12    |                   | 162/10A2  | 0.21.00          |
| 13    |                   | 162/10A3A | 0.25.50          |
| 14    |                   | 162/10A3B | 0.03.00          |
| 15    | Poonithangal      | 117/12A2  | 0.42.00          |
| 16    |                   | 144/1A    | 0.42.08          |
| 17    |                   | 144/2     | 0.40.50          |
| Total |                   |           | 3.38.58          |

| Sl.No | LATITUDE      | LONGITUDE     |
|-------|---------------|---------------|
| 1     | 12°44'7.73"N  | 79°43'2.53"E  |
| 2     | 12°44'2.21"N  | 79°43'1.40"E  |
| 3     | 12°44'1.45"N  | 79°43'1.67"E  |
| 4     | 12°44'0.88"N  | 79°43'1.41"E  |
| 5     | 12°43'59.10"N | 79°43'0.89"E  |
| 6     | 12°43'59.51"N | 79°42'58.74"E |
| 7     | 12°43'59.80"N | 79°42'57.67"E |
| 8     | 12°44'0.02"N  | 79°42'57.57"E |
| 9     | 12°44'1.14"N  | 79°42'58.01"E |
| 10    | 12°44'1.33"N  | 79°42'57.55"E |
| 11    | 12°44'1.85"N  | 79°42'55.71"E |
| 12    | 12°44'3.64"N  | 79°42'56.30"E |
| 13    | 12°44'3.96"N  | 79°42'55.27"E |
| 14    | 12°44'4.97"N  | 79°42'55.44"E |
| 15    | 12°44'4.81"N  | 79°42'56.07"E |
| 16    | 12°44'4.95"N  | 79°42'56.10"E |
| 17    | 12°44'4.82"N  | 79°42'56.72"E |
| 18    | 12°44'6.06"N  | 79°42'56.90"E |
| 19    | 12°44'5.91"N  | 79°42'58.01"E |
| 20    | 12°44'5.65"N  | 79°42'59.88"E |
| 21    | 12°44'8.20"N  | 79°43'0.97"E  |

**APPLICANT:**  
**M/s.SRI KANNIAMMAL BLUE METALS,**  
**PROPRIETOR, Mr.K.KUMAR**  
**S/o.KANNAIYAN,**  
**S.No.660/2A, 2B, 2C, 2D, 660/1A, 1B,**  
**AARPAKKAM VILLAGE,**  
**WALAJABAD TALUK,**  
**KANCHEEPURAM DISTRICT.**

**LEASE APPLIED AREA:**  
**S.F.No** : 162/1, 162/2A, 162/2B, 162/3, 162/4, 162/5A, 162/5B, 162/6, 162/7, 162/8, 162/10A1, 162/10A2, 162/10A3A, 162/10A3B & 117/12A2, 144/1A, 144/2  
**EXTENT** : 3.38.58Hect  
**VILLAGE** : KUNDIYATHANDALAM & POONATHANGAL  
**TALUK** : VEMBAKKAM.  
**DISTRICT** : TIRUVANNAMALAI.

# MINE LEASE PLAN PLAN SCALE 1 : 1000

## INDEX

MINE LEASE AREA  
SAFETY DISTANCE  
APPROACH ROAD  
BOUNDARY PILLAR STONES

## PLATE No- II

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.  
QUALIFIED PERSON



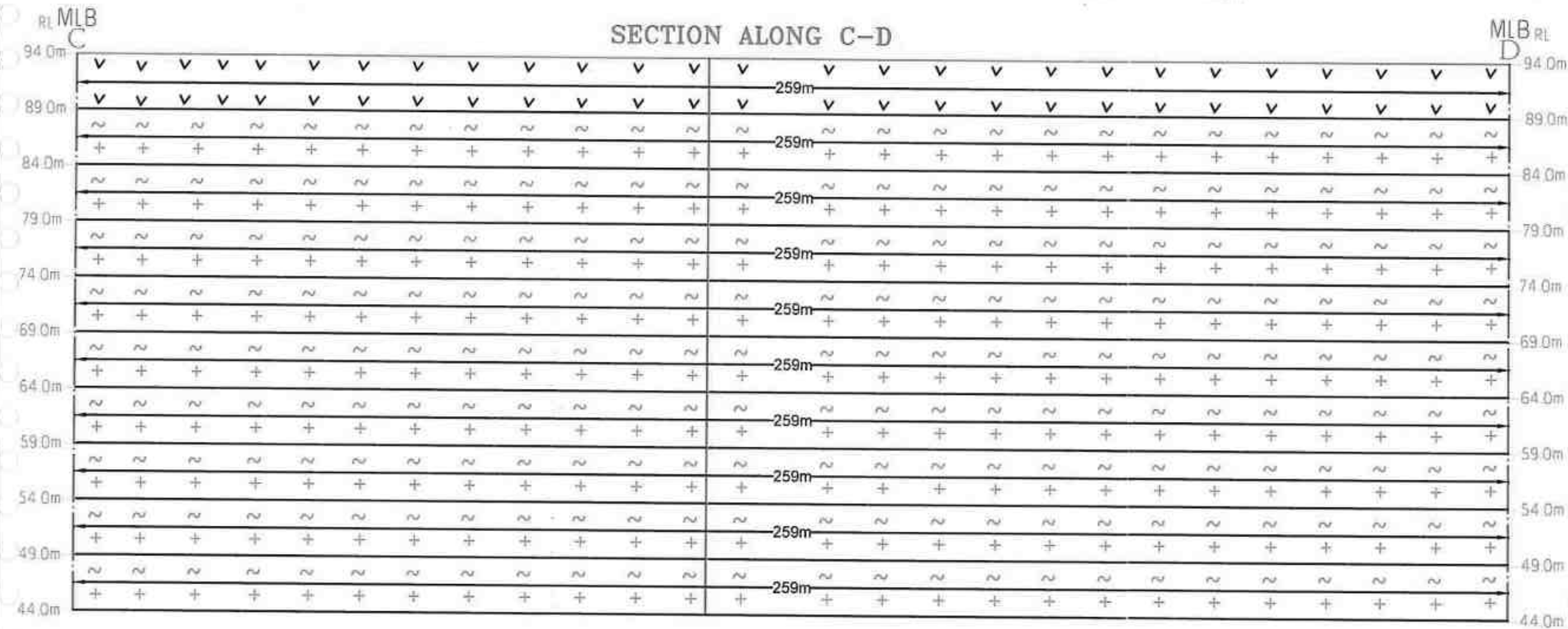
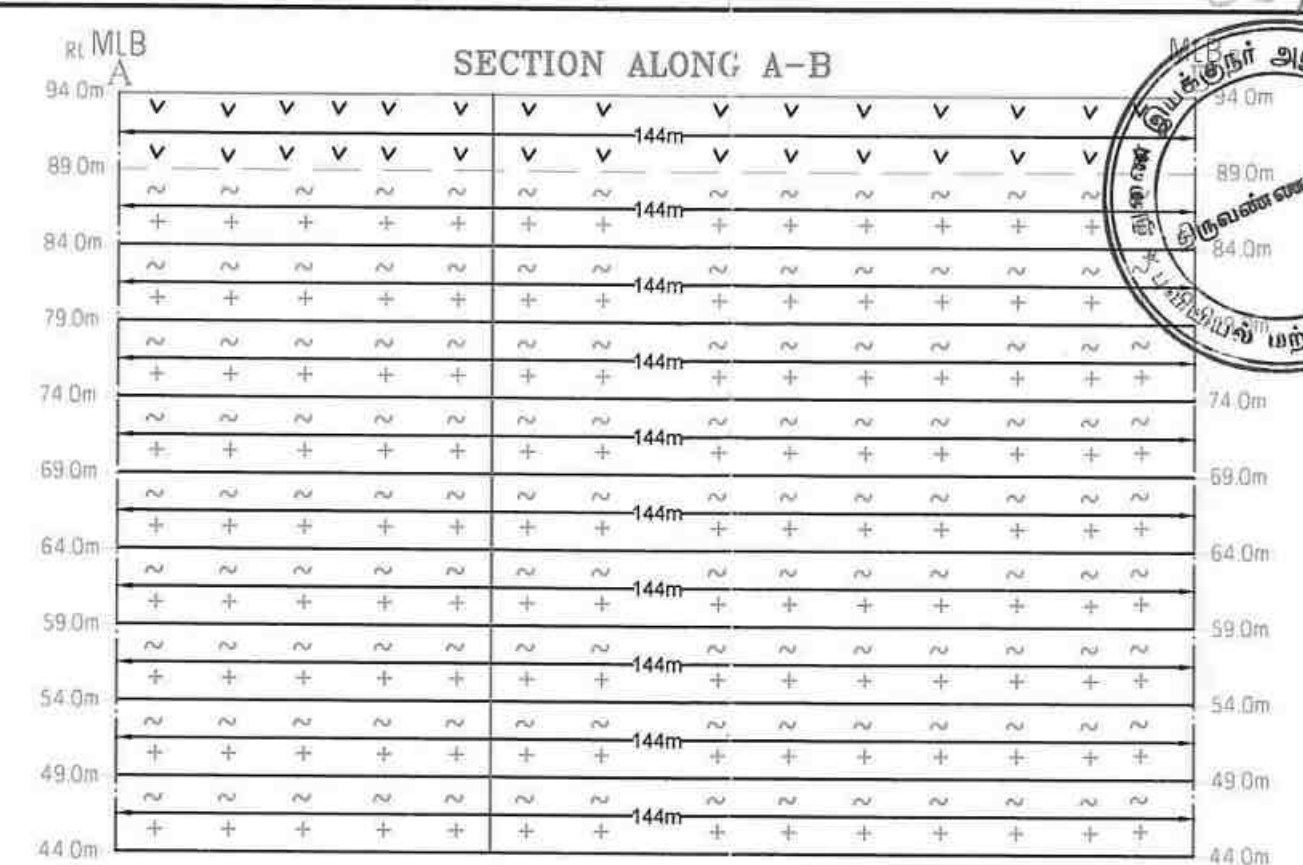
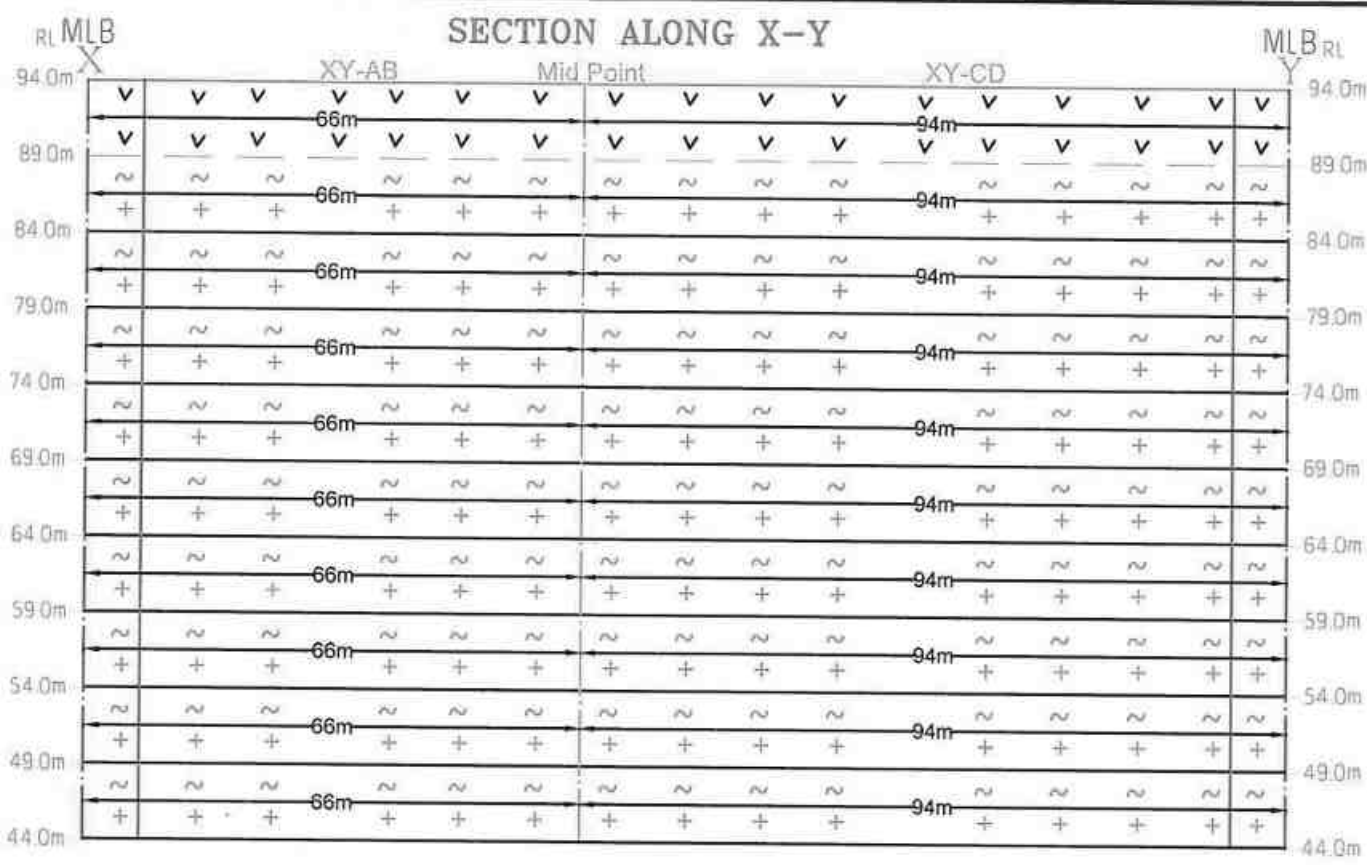
Common Boundary



Common Boundary

| SURFACE & GEOLOGICAL PLAN                                                                                                                                                                           |                                                                                                                                                        | INDEX                        |                        | PLATE No-III |  |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------|------------------------|--------------|--|
| PLAN- SCALE 1: 1000                                                                                                                                                                                 |                                                                                                                                                        |                              |                        |              |  |
| APPLICANT:<br>M/s.SRI KANNIAMMAL BLUE METALS,<br>PROPRIETOR, Mr.K.KUMAR<br>S/o.KANNAIYAN,<br>No.660/2A, 2B, 2C, 2D, 660/1A, 1B,<br>AARPAKKAM VILLAGE,<br>WALAJABAD TALUK,<br>KANCHEEPURAM DISTRICT. | LEASE APPLIED AREA:                                                                                                                                    |                              | MINE LEASE AREA        |              |  |
|                                                                                                                                                                                                     | S.F.No                                                                                                                                                 |                              | SAFETY DISTANCE        |              |  |
|                                                                                                                                                                                                     | :162/1, 162/2A, 162/2B, 162/3, 162/4,<br>162/5A, 162/5B, 162/6, 162/7, 162/8,<br>162/10A1, 162/10A2, 162/10A3A,<br>162/10A3B & 117/12A2, 144/1A, 144/2 |                              | APPROACH ROAD          |              |  |
|                                                                                                                                                                                                     | EXTENT                                                                                                                                                 |                              | BOUNDARY PILLAR STONES |              |  |
|                                                                                                                                                                                                     | : 3.38.58Hect                                                                                                                                          |                              | GRAVEL & SHRUBS        |              |  |
|                                                                                                                                                                                                     | VILLAGE                                                                                                                                                |                              | CONTOUR LINES          |              |  |
| : KUNDIYATHANDALAM &<br>POONATHANGAL                                                                                                                                                                |                                                                                                                                                        | TEMPORARY BENCH MARK         |                        |              |  |
| TALUK                                                                                                                                                                                               |                                                                                                                                                        | Dr.S.KARUPPANNAN,M.Sc.,Ph.D. |                        |              |  |
| DISTRICT                                                                                                                                                                                            |                                                                                                                                                        | QUALIFIED PERSON             |                        |              |  |
| : TIRUVANNAMALAI                                                                                                                                                                                    |                                                                                                                                                        |                              |                        |              |  |



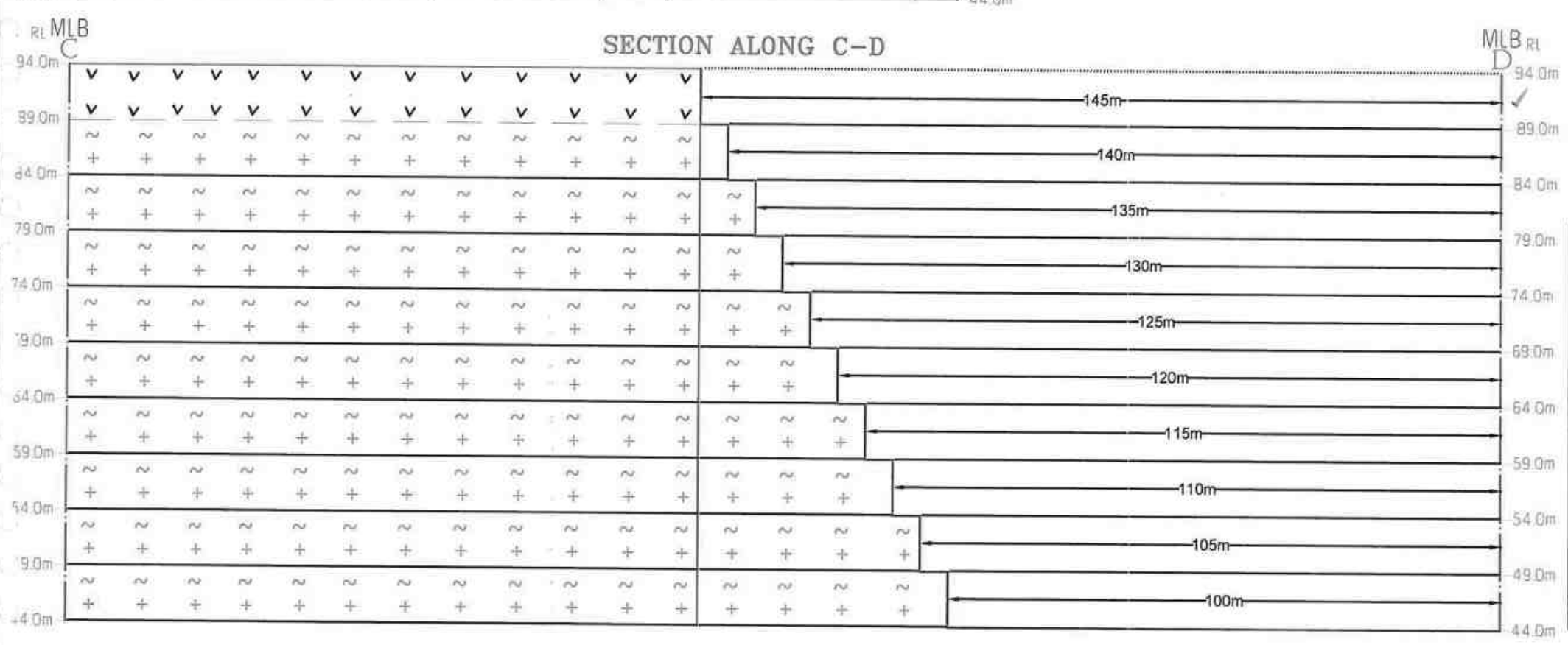
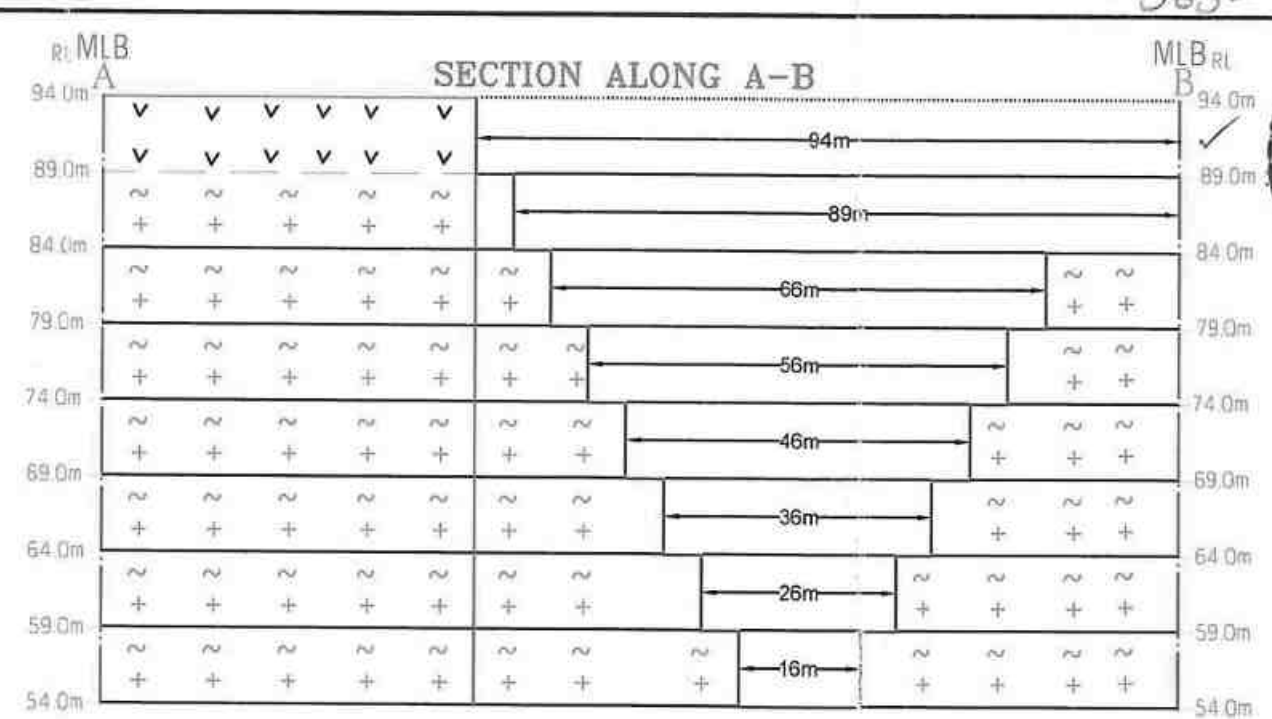
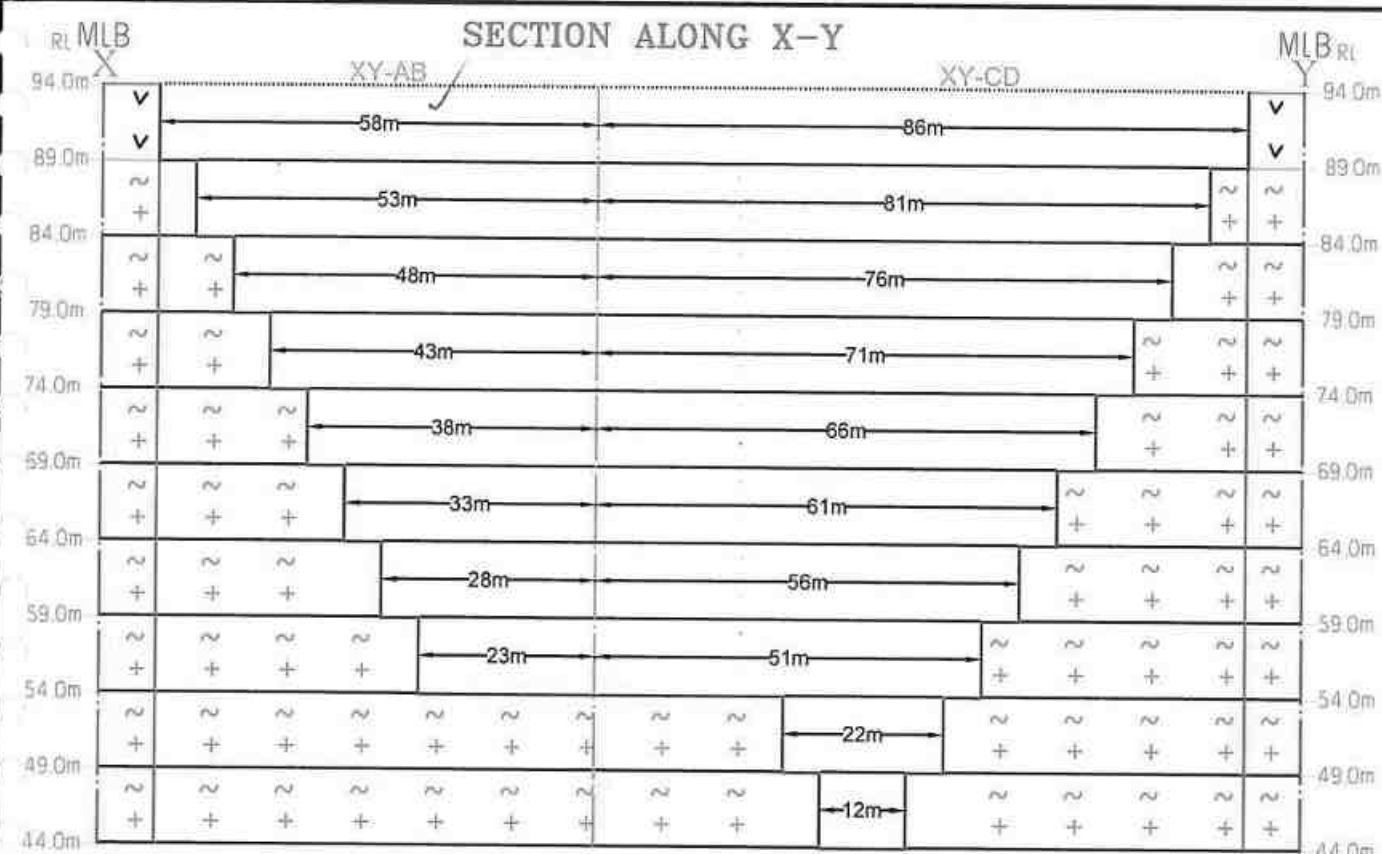


| GEOLOGICAL RESOURCES |       |               |              |              |                          |                               |                          |              |                     |                |
|----------------------|-------|---------------|--------------|--------------|--------------------------|-------------------------------|--------------------------|--------------|---------------------|----------------|
| Section              | Bench | Length in (m) | Width in (m) | Depth in (m) | Volume in m <sup>3</sup> | Rough Stone in m <sup>3</sup> | Gravel in m <sup>3</sup> | Bulk Density | Rough Stone in (Ts) | Gravel in (Ts) |
| XY-AB                | I     | 66            | 144          | 5            | 47520                    | 47520                         | 47520                    | 2            | 130680              | 95040          |
|                      | II    | 66            | 144          | 5            | 47520                    | 47520                         | 47520                    | 2.75         | 130680              | 95040          |
|                      | III   | 66            | 144          | 5            | 47520                    | 47520                         | 47520                    | 2.75         | 130680              | 95040          |
|                      | IV    | 66            | 144          | 5            | 47520                    | 47520                         | 47520                    | 2.75         | 130680              | 95040          |
|                      | V     | 66            | 144          | 5            | 47520                    | 47520                         | 47520                    | 2.75         | 130680              | 95040          |
|                      | VI    | 66            | 144          | 5            | 47520                    | 47520                         | 47520                    | 2.75         | 130680              | 95040          |
|                      | VII   | 66            | 144          | 5            | 47520                    | 47520                         | 47520                    | 2.75         | 130680              | 95040          |
|                      | VIII  | 66            | 144          | 5            | 47520                    | 47520                         | 47520                    | 2.75         | 130680              | 95040          |
|                      | IX    | 66            | 144          | 5            | 47520                    | 47520                         | 47520                    | 2.75         | 130680              | 95040          |
|                      | X     | 66            | 144          | 5            | 47520                    | 47520                         | 47520                    | 2.75         | 130680              | 95040          |
| TOTAL                |       |               |              | 50           | 475200                   | 475200                        | 475200                   |              | 1176120             | 95040          |
| XY-CD                | I     | 94            | 259          | 5            | 121730                   | 121730                        | 121730                   | 2            | 334758              | 243460         |
|                      | II    | 94            | 259          | 5            | 121730                   | 121730                        | 121730                   | 2.75         | 334758              | 243460         |
|                      | III   | 94            | 259          | 5            | 121730                   | 121730                        | 121730                   | 2.75         | 334758              | 243460         |
|                      | IV    | 94            | 259          | 5            | 121730                   | 121730                        | 121730                   | 2.75         | 334758              | 243460         |
|                      | V     | 94            | 259          | 5            | 121730                   | 121730                        | 121730                   | 2.75         | 334758              | 243460         |
|                      | VI    | 94            | 259          | 5            | 121730                   | 121730                        | 121730                   | 2.75         | 334758              | 243460         |
|                      | VII   | 94            | 259          | 5            | 121730                   | 121730                        | 121730                   | 2.75         | 334758              | 243460         |
|                      | VIII  | 94            | 259          | 5            | 121730                   | 121730                        | 121730                   | 2.75         | 334758              | 243460         |
|                      | IX    | 94            | 259          | 5            | 121730                   | 121730                        | 121730                   | 2.75         | 334758              | 243460         |
|                      | X     | 94            | 259          | 5            | 121730                   | 121730                        | 121730                   | 2.75         | 334758              | 243460         |
| TOTAL                |       |               |              | 50           | 1217300                  | 1095570                       | 1217300                  |              | 3012818             | 243460         |
| GRAND TOTAL          |       |               |              |              | 1692500                  | 1523250                       | 1692500                  |              | 4188938             | 338500         |

| GEOLOGICAL SECTIONS                                                                                                                                                                                   |                                                                                                                                                               |             | INDEX           |                              | PLATE No-III A                                                                                             |  |  |  |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------|-----------------|------------------------------|------------------------------------------------------------------------------------------------------------|--|--|--|
| SECTION- SCALE - HOR 1 : 1000 & VER 1: 500                                                                                                                                                            |                                                                                                                                                               |             |                 |                              | Prepared By:                                                                                               |  |  |  |
| APPLICANT:<br>M/s.SRI KANNIAMMAL BLUE METALS,<br>PROPRIETOR, Mr.K.KUMAR<br>S/o.KANNAIYAN,<br>S.No.660/2A, 2B, 2C, 2D, 660/1A, 1B,<br>AARPAKKAM VILLAGE,<br>WALAJABAD TALUK,<br>KANCHEEPURAM DISTRICT. | LEASE APPLIED AREA:                                                                                                                                           |             | MINE LEASE AREA |                              | I DO HEREBY CERTIFY THAT THE PLATE HAS<br>BEEN CHECKED BY ME AND IS CORRECT<br>TO THE BEST OF MY KNOWLEDGE |  |  |  |
|                                                                                                                                                                                                       | S.F.No :162/1, 162/2A, 162/2B, 162/3, 162/4,<br>162/5A, 162/5B, 162/6, 162/7, 162/8,<br>162/10A1, 162/10A2, 162/10A3A,<br>162/10A3B & 117/12A2, 144/1A, 144/2 |             | SAFETY DISTANCE |                              |                                                                                                            |  |  |  |
| EXTENT : 3.38.58Hect                                                                                                                                                                                  |                                                                                                                                                               | ROUGH STONE |                 |                              |                                                                                                            |  |  |  |
| VILLAGE : KUNDIYATHANDALAM &<br>POONAI THANGAL                                                                                                                                                        |                                                                                                                                                               | GRAVEL      |                 |                              |                                                                                                            |  |  |  |
| TALUK : VEMBAKKAM                                                                                                                                                                                     |                                                                                                                                                               |             |                 | Dr.S.KARUPPANNAN,M.Sc.,Ph.D. |                                                                                                            |  |  |  |
| DISTRICT : TIRUVANNAMALAI.                                                                                                                                                                            |                                                                                                                                                               |             |                 | QUALIFIED PERSON             |                                                                                                            |  |  |  |







| MINEABLE RESERVES |       |               |              |              |              |                   |              |              |                     |                |
|-------------------|-------|---------------|--------------|--------------|--------------|-------------------|--------------|--------------|---------------------|----------------|
| Section           | Bench | Length in (m) | Width in (m) | Depth in (m) | Volume in m³ | Rough Stone in m³ | Gravel in m³ | Bulk Density | Rough Stone in (Ts) | Gravel in (Ts) |
| XY-AB             | I     | 58            | 94           | 5            | 27260        | 27260             | 2            | 2.75         | 64859               | 54520          |
|                   | II    | 53            | 89           | 5            | 23585        | 23585             | 2            | 2.75         | 43560               | 33110          |
|                   | III   | 48            | 66           | 5            | 15840        | 15840             | 2            | 2.75         | 24035               | 16335          |
|                   | IV    | 43            | 56           | 5            | 12040        | 12040             | 2            | 2.75         | 10010               | 5060           |
|                   | V     | 38            | 46           | 5            | 8740         | 8740              | 2            | 2.75         | 5060                | 5060           |
|                   | VI    | 33            | 36           | 5            | 5940         | 5940              | 2            | 2.75         | 16335               | 16335          |
|                   | VII   | 28            | 26           | 5            | 3640         | 3640              | 2            | 2.75         | 10010               | 10010          |
|                   | VIII  | 23            | 16           | 5            | 1840         | 1840              | 2            | 2.75         | 5060                | 5060           |
| TOTAL             |       |               |              | 40           | 98885        | 71625             | 27260        | 2.75         | 196969              | 54520          |
| XY-CD             | I     | 86            | 145          | 5            | 62350        | 62350             | 2            | 2.75         | 155925              | 124700         |
|                   | II    | 81            | 140          | 5            | 56700        | 56700             | 2            | 2.75         | 141075              | 113438         |
|                   | III   | 76            | 135          | 5            | 51300        | 51300             | 2            | 2.75         | 126913              | 100650         |
|                   | IV    | 71            | 130          | 5            | 46150        | 46150             | 2            | 2.75         | 113438              | 88550          |
|                   | V     | 66            | 125          | 5            | 41250        | 41250             | 2            | 2.75         | 100650              | 77138          |
|                   | VI    | 61            | 120          | 5            | 36600        | 36600             | 2            | 2.75         | 88550               | 65000          |
|                   | VII   | 56            | 115          | 5            | 32200        | 32200             | 2            | 2.75         | 77138               | 56000          |
|                   | VIII  | 51            | 110          | 5            | 28050        | 28050             | 2            | 2.75         | 65000               | 48000          |
| TOTAL             |       |               |              | 50           | 372150       | 309800            | 62350        | 2.75         | 851950              | 124700         |
| GRAND TOTAL       |       |               |              |              | 471035       | 381425            | 89610        | 2.75         | 1048919             | 179220         |

| CONCEPTUAL SECTIONS                                                                                                                                                                                          |  | INDEX                                                                                                                                                                                                                                                                                                                  |  | PLATE No-IVA                                                                                                                                                                         |  |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|
| SECTION- SCALE - HOR 1 : 1000 & VER 1 : 500                                                                                                                                                                  |  |                                                                                                                                                                                                                                                                                                                        |  |                                                                                                                                                                                      |  |
| <b>APPLICANT:</b><br>M/s.SRI KANNIAMMAL BLUE METALS,<br>PROPRIETOR, Mr.K.KUMAR<br>S/o.KANNAIYAN,<br>S.No.660/2A, 2B, 2C, 2D, 660/1A, 1B,<br>AARPAKKAM VILLAGE,<br>WALAJABAD TALUK,<br>KANCHEEPURAM DISTRICT. |  | <b>LEASE APPLIED AREA:</b><br>S.F.No : 162/1, 162/2A, 162/2B, 162/3, 162/4,<br>162/5A, 162/5B, 162/6, 162/7, 162/8,<br>162/10A1, 162/10A2, 162/10A3A,<br>162/10A3B & 117/12A2, 144/1A, 144/2<br>EXTENT : 3.38.58Hect<br>VILLAGE : KUNDIYATHANDALAM &<br>POONATHANGAL<br>TALUK : VEMBAKKAM<br>DISTRICT : TIRUVANNAMALAI |  | MINE LEASE AREA<br>SAFETY DISTANCE<br>ROUGH STONE<br>GRAVEL<br>ULTIMATE BENCH                                                                                                        |  |
|                                                                                                                                                                                                              |  |                                                                                                                                                                                                                                                                                                                        |  | Prepared By:<br>I DO HEREBY CERTIFY THAT THE PLATE HAS<br>BEEN CHECKED BY ME AND IS CORRECT<br>TO THE BEST OF MY KNOWLEDGE<br><br>Dr.S.KARUPPANNAN, M.Sc., Ph.D.<br>QUALIFIED PERSON |  |







| INDEX                    |                                                                                     |
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| BOUNDARY PILLAR STONES   |  |
| GRAVEL & SHRUBS          |  |
| CONTOUR LINES            |  |
| TEMPORARY BENCH MARK     |  |
| FENCING                  |  |
| DRAINAGE & SETTLING TANK |  |
| PROPOSED BENCH           |  |

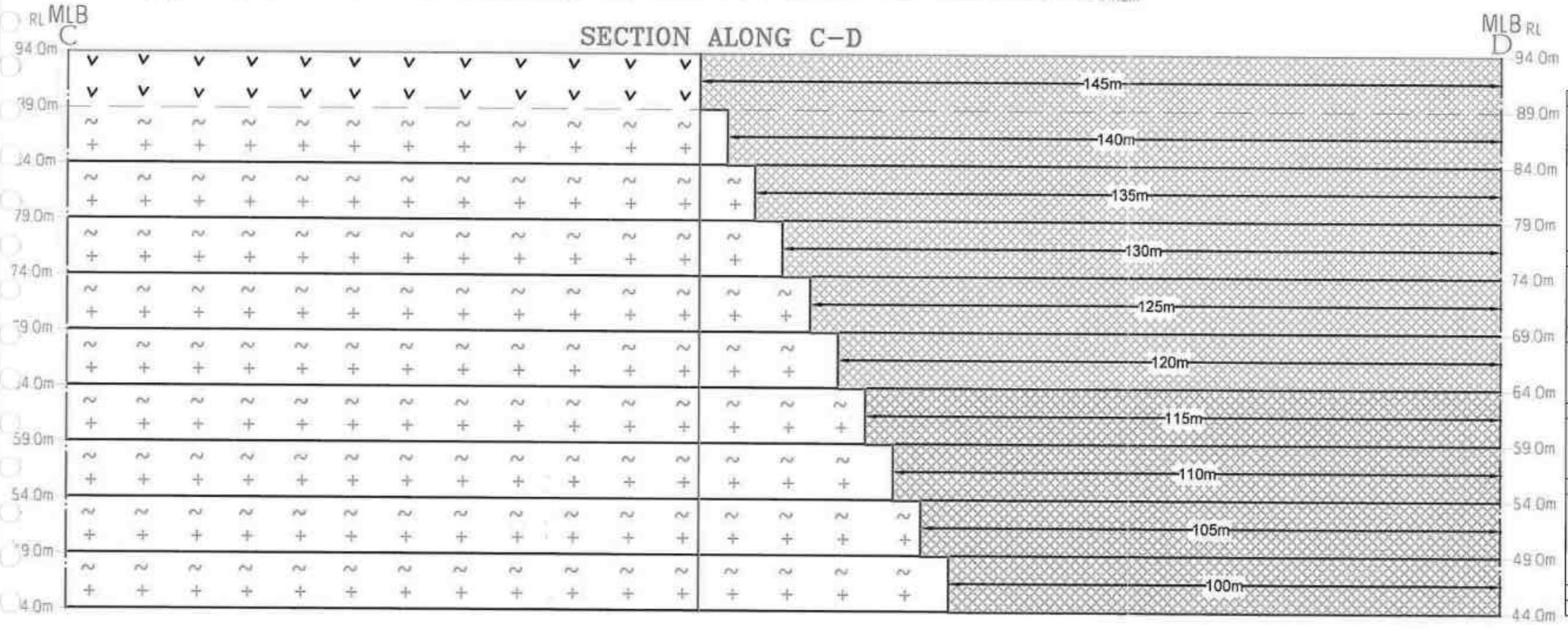
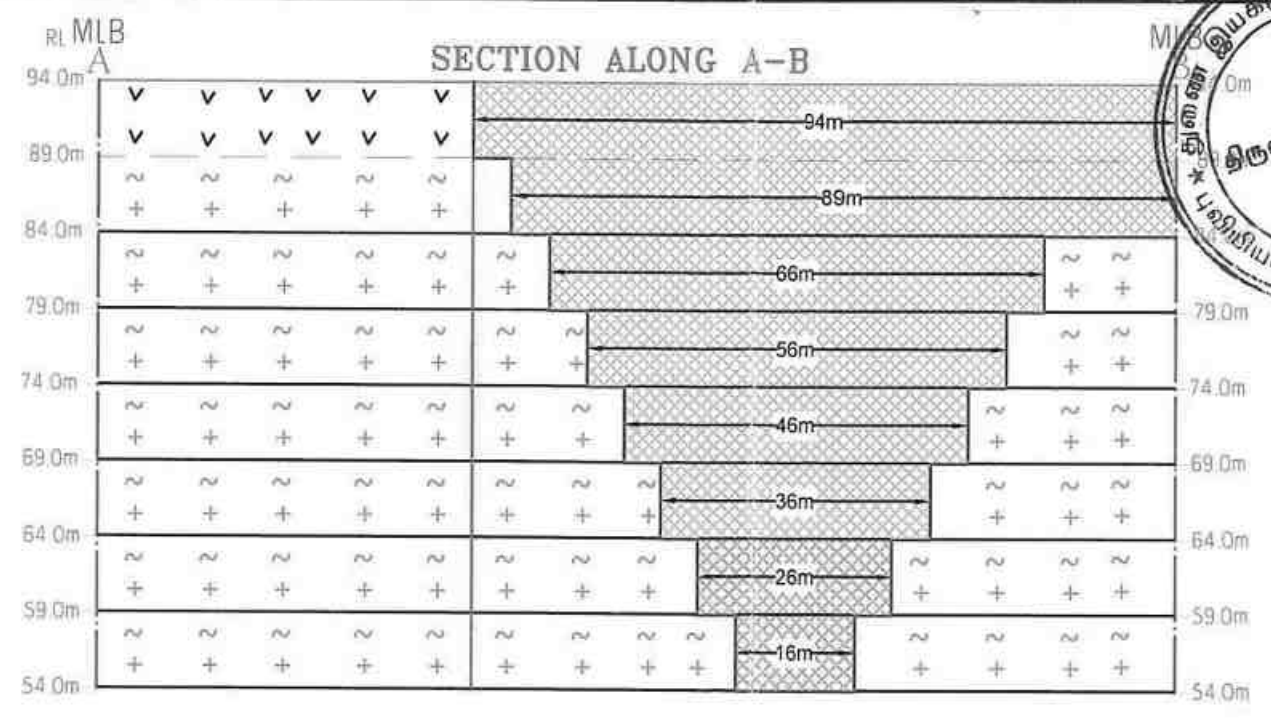
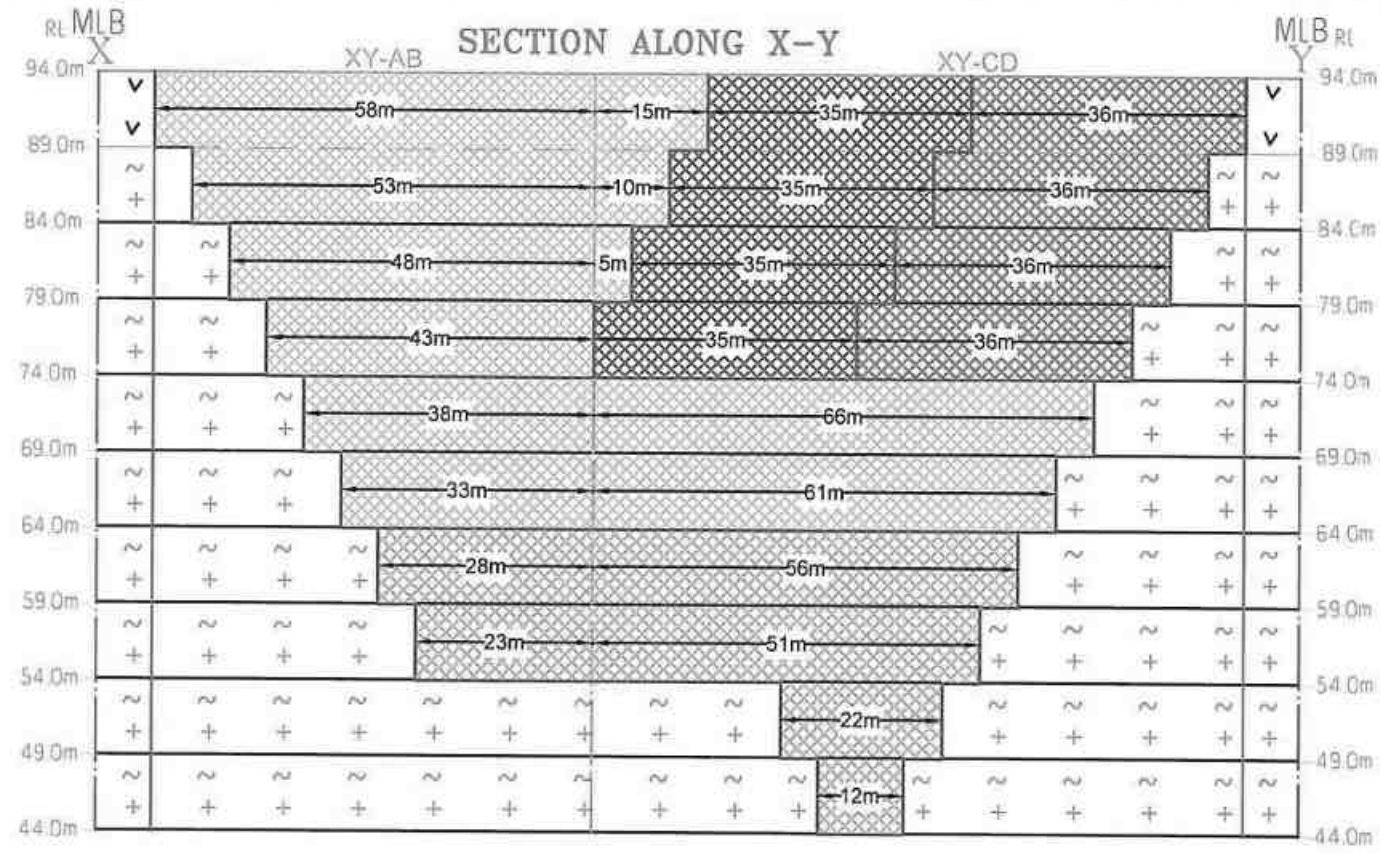
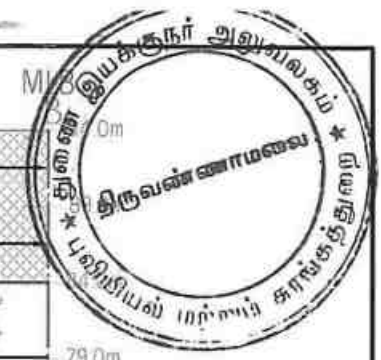
PLATE No-VI

Prepared By:

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







| YEARWISE PRODUCTION RESERVES |         |       |               |              |              |                          |                               |                          |              |                     |                |
|------------------------------|---------|-------|---------------|--------------|--------------|--------------------------|-------------------------------|--------------------------|--------------|---------------------|----------------|
| Year                         | Section | Bench | Length in (m) | Width in (m) | Depth in (m) | Volume in m <sup>3</sup> | Rough Stone in m <sup>3</sup> | Gravel in m <sup>3</sup> | Bulk Density | Rough Stone in (Ts) | Gravel in (Ts) |
| I-YEAR                       | XY-AB   | I     | 58            | 94           | 5            | 27260                    |                               | 27260                    | 2            |                     | 54520          |
|                              |         | II    | 53            | 89           | 5            | 23585                    | 23585                         |                          | 2.75         | 64859               |                |
|                              |         | III   | 48            | 66           | 5            | 15840                    | 15840                         |                          | 2.75         | 43560               |                |
|                              |         | IV    | 43            | 56           | 5            | 12040                    | 12040                         |                          | 2.75         | 33110               |                |
|                              | XY-CD   | I     | 15            | 145          | 5            | 10875                    |                               | 10875                    | 2            |                     | 21750          |
|                              |         | II    | 10            | 140          | 5            | 7000                     | 7000                          |                          | 2.75         | 19250               |                |
| III                          |         | 5     | 135           | 5            | 3375         | 3375                     |                               | 2.75                     | 9281         |                     |                |
| TOTAL                        |         |       |               |              |              | 99975                    | 61840                         | 38135                    |              | 170960              | 76270          |
| II-YEAR                      | XY-CD   | I     | 35            | 145          | 5            | 25375                    |                               | 25375                    | 2            |                     | 50750          |
|                              |         | II    | 35            | 140          | 5            | 24300                    | 24300                         |                          | 2.75         | 67375               |                |
|                              |         | III   | 35            | 135          | 5            | 23625                    | 23625                         |                          | 2.75         | 64969               |                |
|                              |         | IV    | 35            | 130          | 5            | 22750                    | 22750                         |                          | 2.75         | 62563               |                |
|                              | TOTAL   |       |               |              |              |                          | 96250                         | 70875                    | 25375        |                     | 194907         |
| III-YEAR                     | XY-CD   | I     | 36            | 145          | 5            | 26100                    |                               | 26100                    | 2            |                     | 52200          |
|                              |         | II    | 36            | 140          | 5            | 25200                    | 25200                         |                          | 2.75         | 69300               |                |
|                              |         | III   | 36            | 135          | 5            | 24300                    | 24300                         |                          | 2.75         | 66825               |                |
|                              |         | IV    | 36            | 130          | 5            | 23400                    | 23400                         |                          | 2.75         | 64350               |                |
|                              | TOTAL   |       |               |              |              |                          | 99000                         | 72900                    | 26100        |                     | 200475         |
| IV-YEAR                      | XY-AB   | V     | 38            | 46           | 5            | 8740                     | 8740                          |                          | 2.75         | 24035               |                |
|                              |         | VI    | 33            | 36           | 5            | 5940                     | 5940                          |                          | 2.75         | 16335               |                |
|                              |         | V     | 66            | 125          | 5            | 41250                    | 41250                         |                          | 2.75         | 113438              |                |
|                              | XY-CD   | VI    | 61            | 120          | 5            | 36600                    | 36600                         |                          | 2.75         | 100650              |                |
|                              |         | TOTAL |               |              |              |                          |                               | 92530                    | 92530        | 0                   |                |
| V-YEAR                       | XY-AB   | VII   | 28            | 26           | 5            | 3640                     | 3640                          |                          | 2.75         | 10010               |                |
|                              |         | VIII  | 23            | 16           | 5            | 1840                     | 1840                          |                          | 2.75         | 5060                |                |
|                              |         | VII   | 56            | 115          | 5            | 32200                    | 32200                         |                          | 2.75         | 88550               |                |
|                              | XY-CD   | VIII  | 51            | 110          | 5            | 28050                    | 28050                         |                          | 2.75         | 77138               |                |
|                              |         | IX    | 22            | 105          | 5            | 11550                    | 11550                         |                          | 2.75         | 31763               |                |
|                              |         | X     | 12            | 100          | 5            | 6000                     | 6000                          |                          | 2.75         | 16500               |                |
|                              |         | TOTAL |               |              |              |                          |                               | 83280                    | 83280        | 0                   |                |
| GRAND TOTAL                  |         |       |               |              |              | 471035                   | 381425                        | 89610                    |              | 1048919             | 179220         |

- 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

YEARWISE DEVELOPMENT & PRODUCTION SECTIONS  
SECTION- SCALE - HOR 1 : 1000 & VER 1 : 500

APPLICANT:  
M/s.SRI KANNIAMMAL BLUE METALS,  
PROPRIETOR, Mr.K.KUMAR  
S/o.KANNAIYAN,  
S.No.660/2A, 2B, 2C, 2D, 660/1A, 1B,  
AARPAKKAM VILLAGE,  
WALAJABAD TALUK,  
KANCHEEPURAM DISTRICT.

LEASE APPLIED AREA:  
S.F.No :162/1, 162/2A, 162/2B, 162/3, 162/4,  
162/5A, 162/5B, 162/6, 162/7, 162/8,  
162/10A1, 162/10A2, 162/10A3A,  
162/10A3B & 117/12A2, 144/1A, 144/2

EXTENT : 3.38.58Hect  
VILLAGE : KUNDIYATHANDALAM &  
POONATHANGAL  
TALUK : VEMBAKKI  
DISTRICT : TIRUVANNAMALAI.

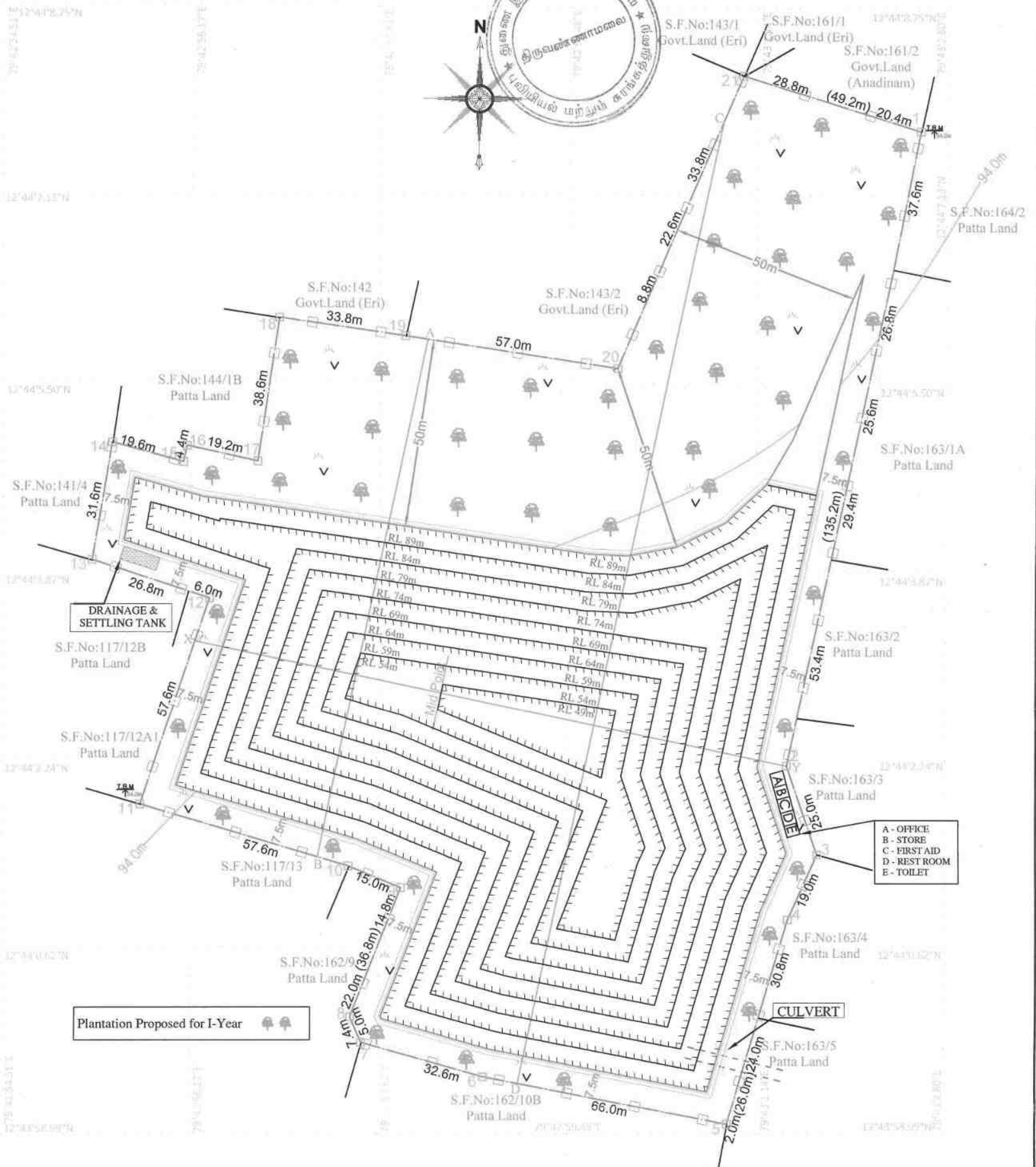
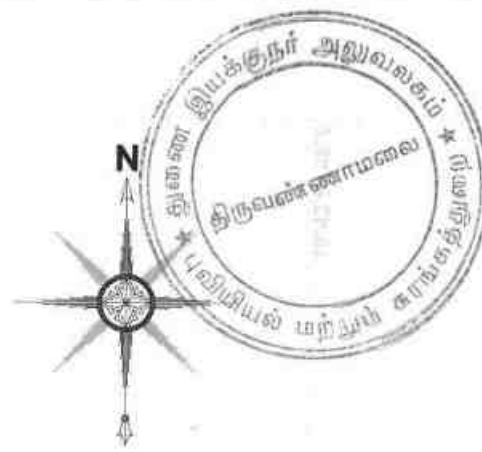
- INDEX
- MINE LEASE AREA
  - SAFETY DISTANCE
  - ROUGH STONE
  - GRAVEL
  - PROPOSED BENCH

PLATE No-VIA

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.  
QUALIFIED PERSON



Plantation Proposed for I-Year

A - OFFICE  
B - STORE  
C - FIRST AID  
D - REST ROOM  
E - TOILET

CONCEPTUAL PLAN  
PLAN- SCALE 1: 1000

| INDEX                    |  |
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| CONTOUR LINES            |  |
| TEMPORARY BENCH MARK     |  |
| FENCING                  |  |
| DRAINAGE & SETTLING TANK |  |
| ULTIMATE BENCH           |  |

PLATE No-IV

Prepared By:

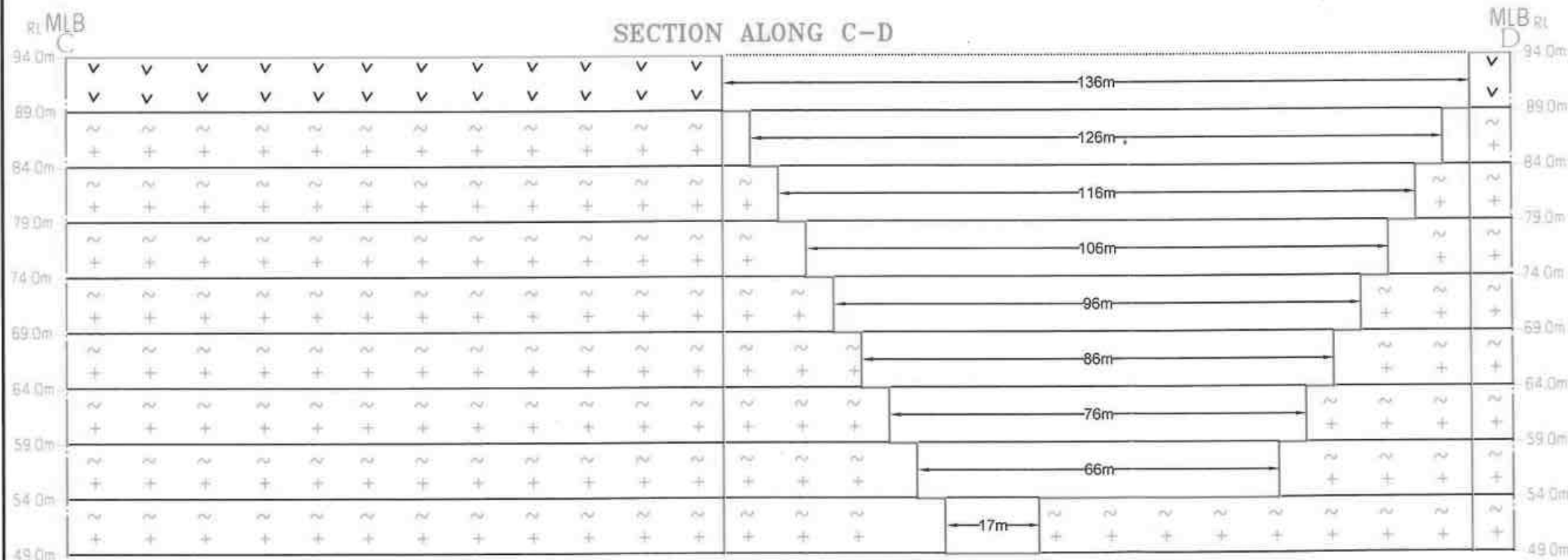
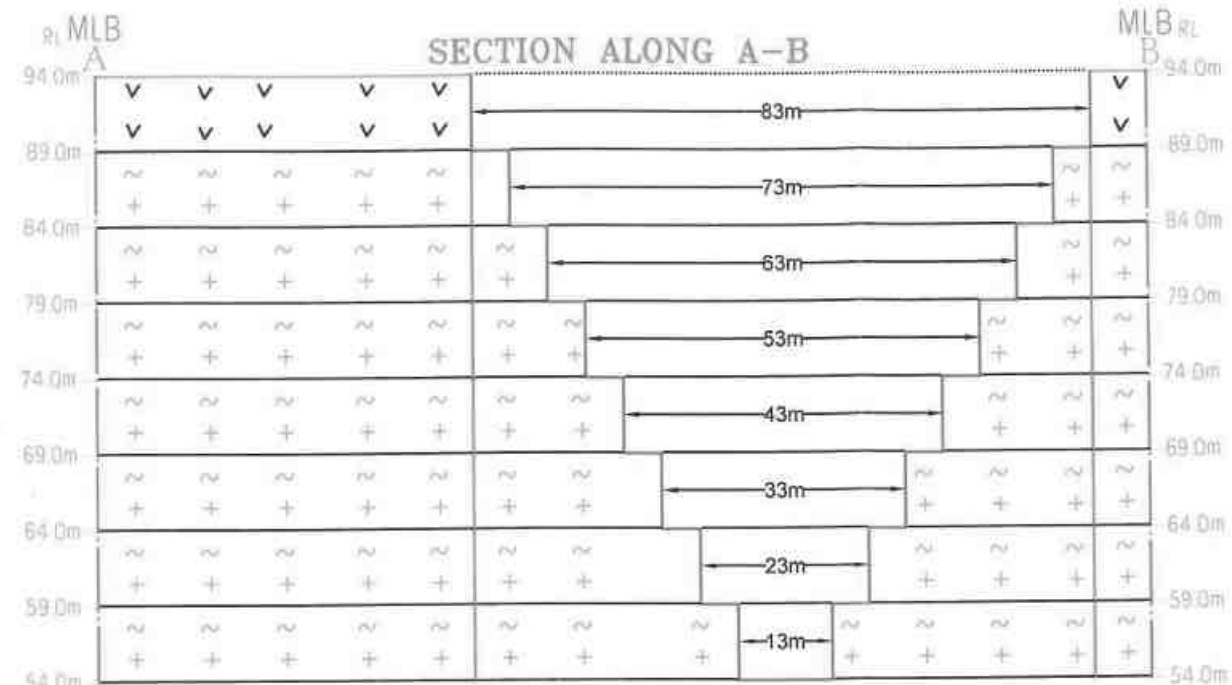
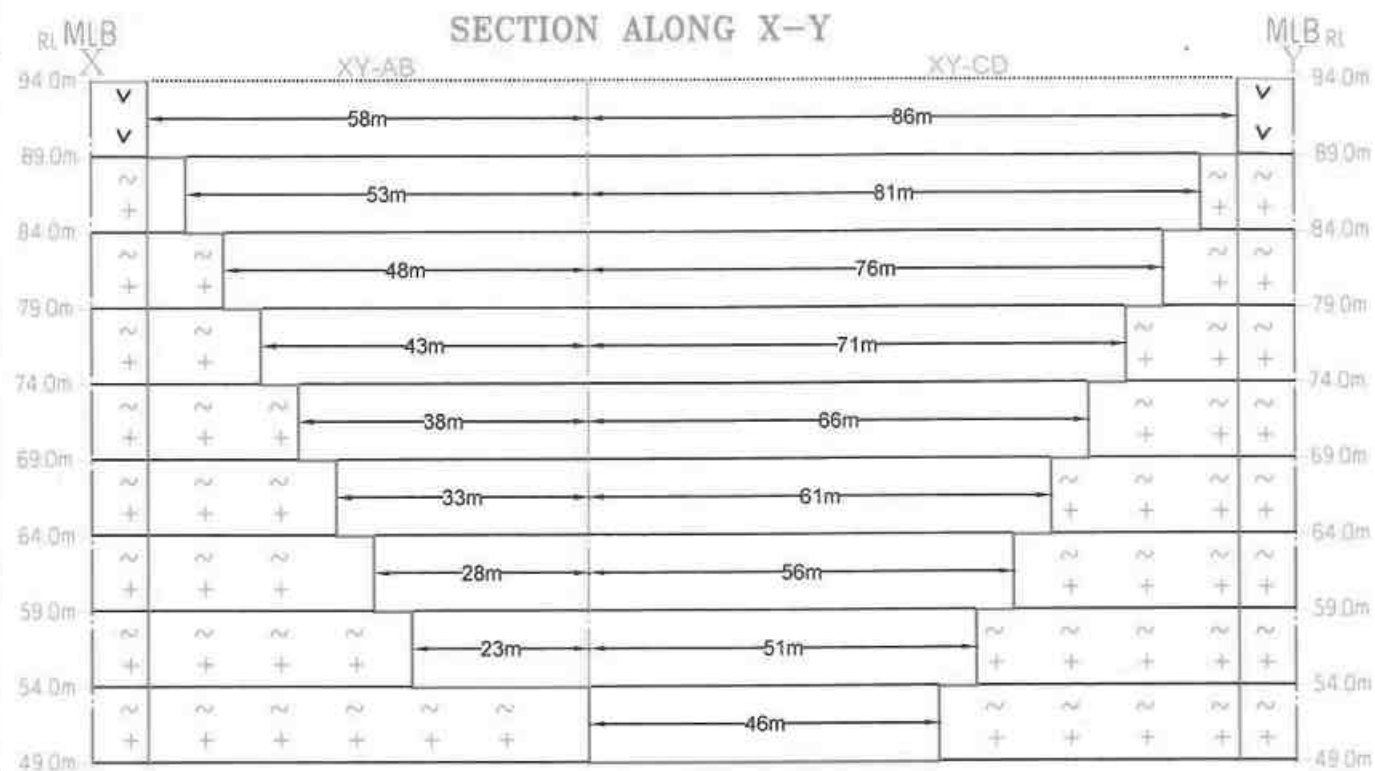
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Dr.S.KARUPPANNAN, M.Sc., Ph.D.  
QUALIFIED PERSON

**APPLICANT:**  
M/s.SRI KANNIAMMAL BLUE METALS,  
PROPRIETOR, Mr.K.KUMAR  
S/o.KANNAIYAN,  
S.No.660/2A, 2B, 2C, 2D, 660/1A, 1B,  
AARPAKKAM VILLAGE,  
WALAJABAD TALUK,  
KANCHEEPURAM DISTRICT.

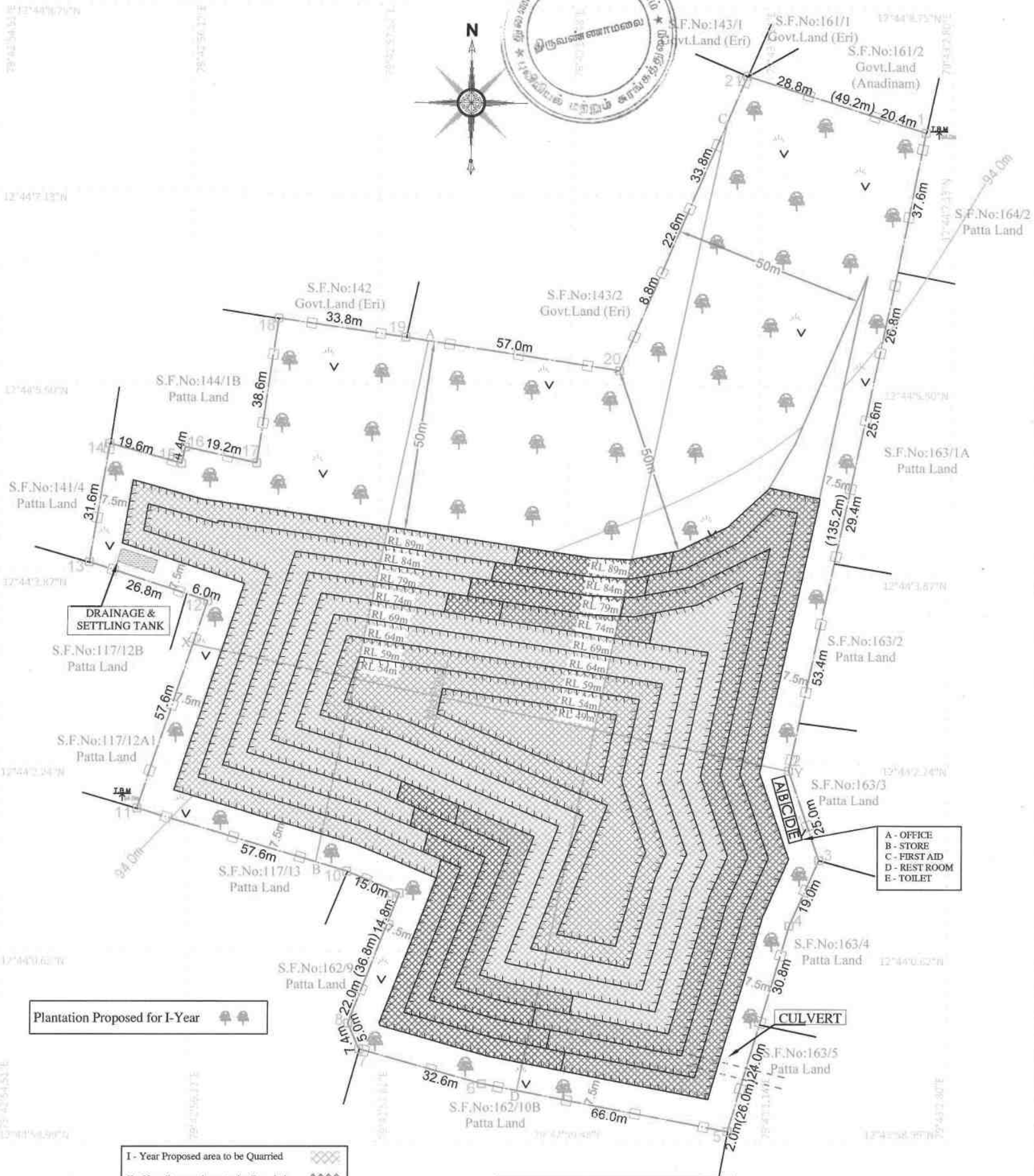
**LEASE APPLIED AREA:**  
S.F.No :162/1, 162/2A, 162/2B, 162/3, 162/4,  
162/5A, 162/5B, 162/6, 162/7, 162/8,  
162/10A1, 162/10A2, 162/10A3A,  
162/10A3B & 117/12A2, 144/1A, 144/2  
**EXTENT** : 3.38.58Hect  
**VILLAGE** : KUNDIYATHANDALAM &  
POONAITHANGAL  
**TALUK** : VEMBAKKAM,  
**DISTRICT** : TIRUVANNAMALAI.





| MINEABLE RESERVES |       |               |              |              |                          |                               |                          |              |                     |                |
|-------------------|-------|---------------|--------------|--------------|--------------------------|-------------------------------|--------------------------|--------------|---------------------|----------------|
| Section           | Bench | Length in (m) | Width in (m) | Depth in (m) | Volume In M <sup>3</sup> | Rough Stone in M <sup>3</sup> | Gravel in M <sup>3</sup> | Bulk Density | Rough Stone in (Ts) | Gravel in (Ts) |
| XY-AB             | I     | 58            | 83           | 5            | 24070                    | .....                         | 24070                    | 2            | .....               | 48140          |
|                   | II    | 53            | 73           | 5            | 19345                    | 19345                         | .....                    | 2.75         | 53199               | .....          |
|                   | III   | 48            | 63           | 5            | 15120                    | 15120                         | .....                    | 2.75         | 41580               | .....          |
|                   | IV    | 43            | 53           | 5            | 11395                    | 11395                         | .....                    | 2.75         | 31336               | .....          |
|                   | V     | 38            | 43           | 5            | 8170                     | 8170                          | .....                    | 2.75         | 22468               | .....          |
|                   | VI    | 33            | 33           | 5            | 5445                     | 5445                          | .....                    | 2.75         | 14974               | .....          |
|                   | VII   | 28            | 23           | 5            | 3220                     | 3220                          | .....                    | 2.75         | 8855                | .....          |
|                   | VIII  | 23            | 13           | 5            | 1495                     | 1495                          | .....                    | 2.75         | 4111                | .....          |
| TOTAL             |       |               |              |              | 88260                    | 64190                         | 24070                    | .....        | 176523              | 48140          |
| XY-CD             | I     | 86            | 136          | 5            | 58480                    | .....                         | 58480                    | 2            | .....               | 116960         |
|                   | II    | 81            | 126          | 5            | 51030                    | 51030                         | .....                    | 2.75         | 140333              | .....          |
|                   | III   | 76            | 116          | 5            | 44080                    | 44080                         | .....                    | 2.75         | 121220              | .....          |
|                   | IV    | 71            | 106          | 5            | 37630                    | 37630                         | .....                    | 2.75         | 103483              | .....          |
|                   | V     | 66            | 96           | 5            | 31680                    | 31680                         | .....                    | 2.75         | 87120               | .....          |
|                   | VI    | 61            | 86           | 5            | 26230                    | 26230                         | .....                    | 2.75         | 72133               | .....          |
|                   | VII   | 56            | 76           | 5            | 21280                    | 21280                         | .....                    | 2.75         | 58520               | .....          |
|                   | VIII  | 51            | 66           | 5            | 16830                    | 16830                         | .....                    | 2.75         | 46283               | .....          |
| TOTAL             |       |               |              |              | 291150                   | 232670                        | 58480                    | .....        | 639845              | 116960         |
| GRAND TOTAL       |       |               |              |              | 379410                   | 296860                        | 82550                    | .....        | 816368              | 16510          |

| CONCEPTUAL SECTIONS                                                                                                                                                                                          |                                                                                                                                                                                                                                                                                                                             | INDEX |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | PLATE No-IVA |                                                                                                                                                                                                                                                             |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| SECTION- SCALE - HOR 1 : 1000 & VER 1: 500                                                                                                                                                                   |                                                                                                                                                                                                                                                                                                                             |       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | Prepared By: |                                                                                                                                                                                                                                                             |
| <u>APPLICANT:</u><br>M/s.SRI KANNIAMMAL BLUE METALS,<br>PROPRIETOR, Mr.K.KUMAR<br>S/o.KANNAIYAN,<br>S.No.660/2A, 2B, 2C, 2D, 660/1A, 1B,<br>AARPAKKAM VILLAGE,<br>WALAJABAD TALUK,<br>KANCHEEPURAM DISTRICT. | <u>LEASE APPLIED AREA:</u><br>S.F.No :162/1, 162/2A, 162/2B, 162/3, 162/4,<br>162/5A, 162/5B, 162/6, 162/7, 162/8,<br>162/10A1, 162/10A2, 162/10A3A,<br>162/10A3B & 117/12A2, 144/1A, 144/2<br><br>EXTENT : 3.38.58Hect<br>VILLAGE : KUNDIYATHANDALAM &<br>POONATHANGAL<br>TALUK : VEMBAKKAM,<br>DISTRICT : TIRUVANNAMALAI. |       | MINE LEASE AREA <br><br>SAFETY DISTANCE <br><br>ROUGH STONE <br><br>GRAVEL <br><br>ULTIMATE BENCH  |              | I DO HEREBY CERTIFY THAT THE PLATE HAS<br>BEEN CHECKED BY ME AND IS CORRECT<br>TO THE BEST OF MY KNOWLEDGE<br><br><br>Dr.S.KARUPPANNAN,M.Sc.,Ph.D.<br>QUALIFIED PERSON |
|                                                                                                                                                                                                              |                                                                                                                                                                                                                                                                                                                             |       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |              |                                                                                                                                                                                                                                                             |



A - OFFICE  
B - STORE  
C - FIRST AID  
D - REST ROOM  
E - TOILET

Plantation Proposed for I-Year

|                                         |      |
|-----------------------------------------|------|
| I - Year Proposed area to be Quarried   | XXXX |
| II - Year Proposed area to be Quarried  | XXXX |
| III - Year Proposed area to be Quarried | XXXX |
| IV - Year Proposed area to be Quarried  | XXXX |
| V - Year Proposed area to be Quarried   | XXXX |

YEARWISE DEVELOPMENT &  
PRODUCTION PLAN  
SCALE 1 : 1000

LEASE APPLIED AREA:

S.F.No : 162/1, 162/2A, 162/2B, 162/3, 162/4,  
162/5A, 162/5B, 162/6, 162/7, 162/8,  
162/10A1, 162/10A2, 162/10A3A,  
162/10A3B & 117/12A2, 144/1A, 144/2  
EXTENT : 3.38.58 Hect  
VILLAGE : KUNDIYATHANDALAM &  
POONATHANGAL  
TALUK : VEMBAKKAM,  
DISTRICT : TIRUVANNAMALAI

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|--------------------------|------|
| MINE LEASE AREA          | XXXX |
| SAFETY DISTANCE          | XXXX |
| APPROACH ROAD            | XXXX |
| BOUNDARY PILLAR STONES   | XXXX |
| GRAVEL & SHRUBS          | XXXX |
| CONTOUR LINES            | XXXX |
| TEMPORARY BENCH MARK     | XXXX |
| FENCING                  | XXXX |
| DRAINAGE & SETTLING TANK | XXXX |
| PROPOSED BENCH           | XXXX |

PLATE No-VI

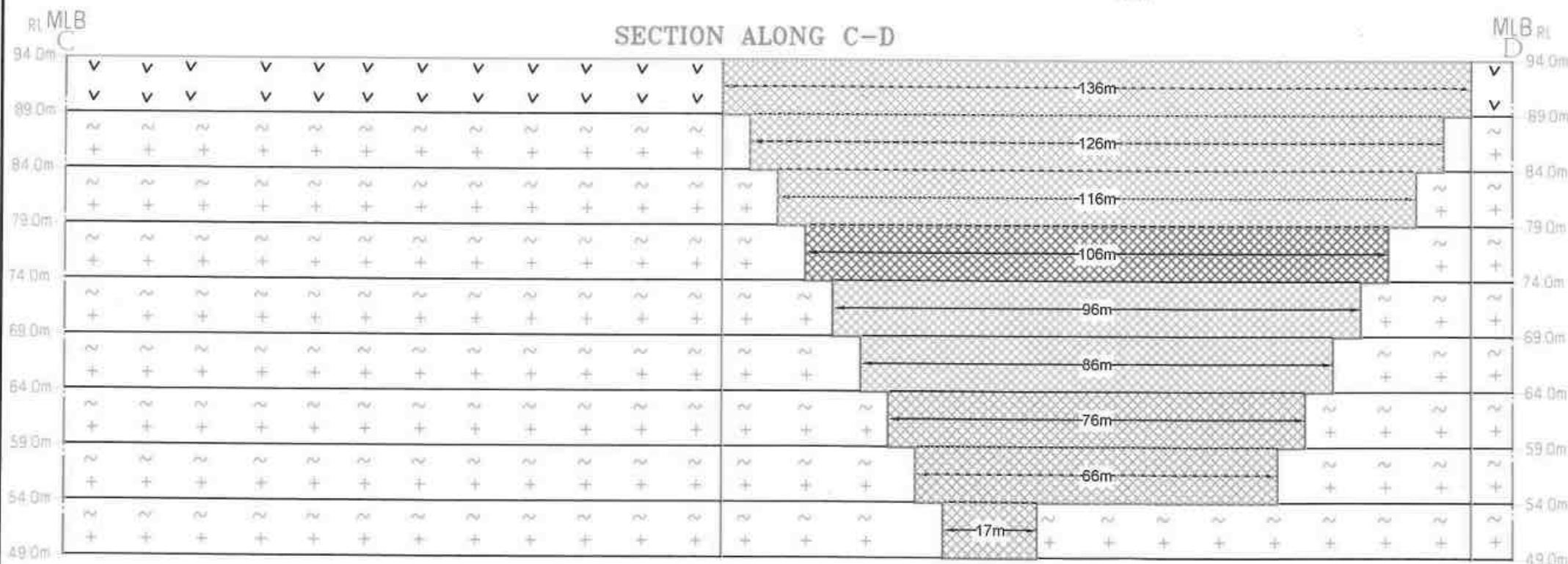
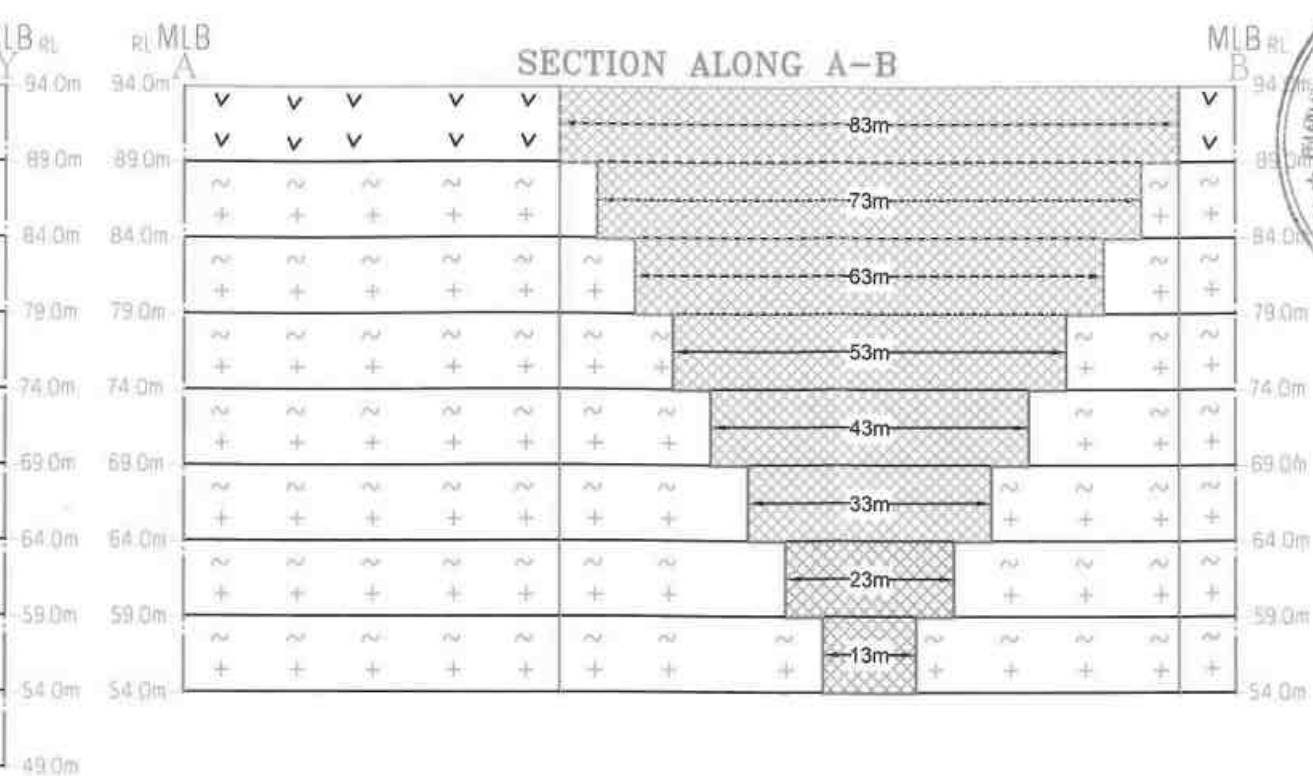
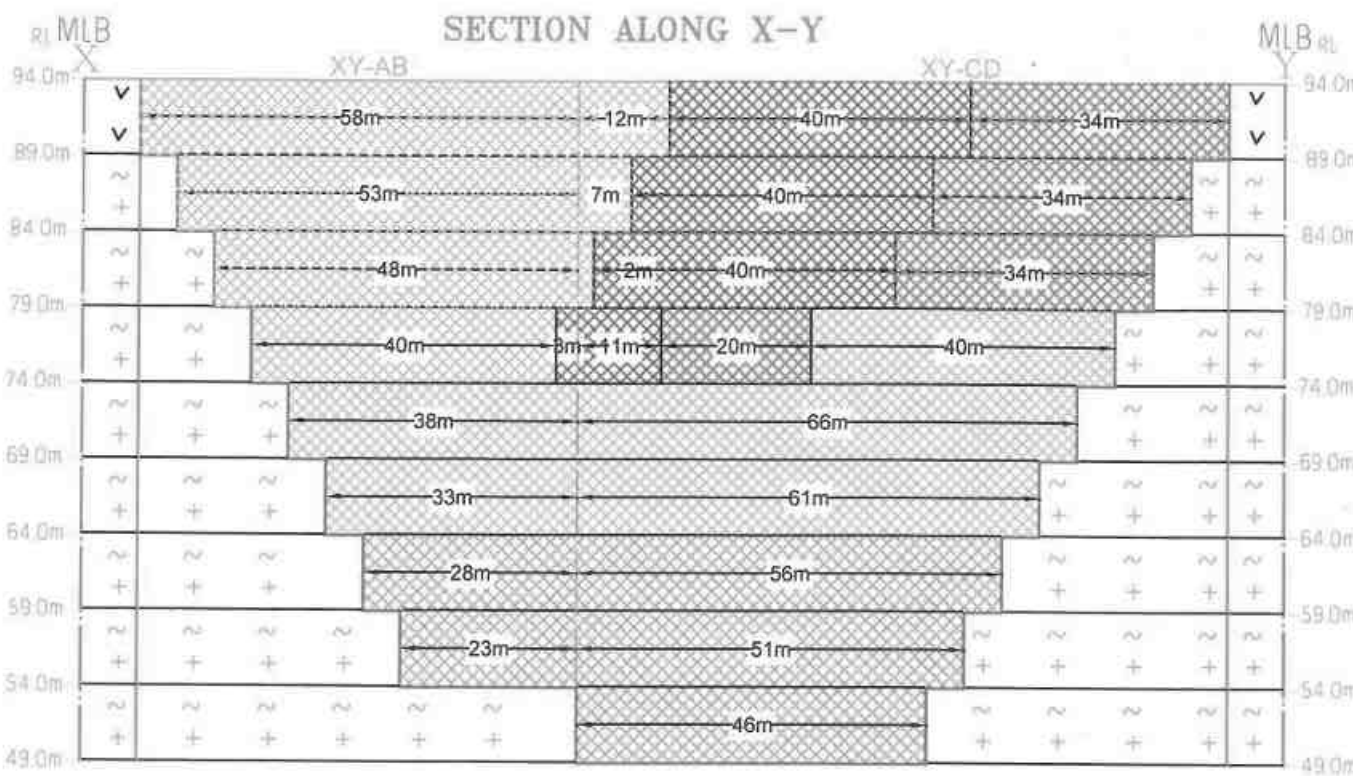
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AARPAKKAM VILLAGE,  
WALAJABAD TALUK,  
KANCHEEPURAM DISTRICT.





| YEARWISE PRODUCTION RESERVES |         |       |               |              |              |                          |                               |                          |              |                     |                |
|------------------------------|---------|-------|---------------|--------------|--------------|--------------------------|-------------------------------|--------------------------|--------------|---------------------|----------------|
| Year                         | Section | Bench | Length in (m) | Width in (m) | Depth in (m) | Volume In M <sup>3</sup> | Rough Stone in M <sup>3</sup> | Gravel in M <sup>3</sup> | Bulk Density | Rough Stone in (Ts) | Gravel in (Ts) |
| I-YEAR                       | XY-AB   | I     | 58            | 83           | 5            | 24070                    |                               | 24070                    | 2            |                     | 48140          |
|                              |         | II    | 53            | 73           | 5            | 19345                    | 19345                         |                          | 2.75         | 53199               |                |
|                              |         | III   | 48            | 63           | 5            | 15120                    | 15120                         |                          | 2.75         | 41580               |                |
|                              |         | IV    | 40            | 53           | 5            | 10600                    | 10600                         |                          | 2.75         | 29150               |                |
|                              | XY-CD   | I     | 12            | 136          | 5            | 8160                     |                               | 8160                     | 2            |                     | 16320          |
|                              |         | II    | 7             | 126          | 5            | 4410                     | 4410                          |                          | 2.75         | 12128               |                |
|                              |         | III   | 2             | 116          | 5            | 1160                     | 1160                          |                          | 2.75         | 3190                |                |
| TOTAL                        |         |       |               |              | 82865        | 50635                    | 32230                         | .....                    | 139247       | 64460               |                |
| II-YEAR                      | XY-CD   | I     | 40            | 136          | 5            | 27200                    |                               | 27200                    | 2            |                     | 54400          |
|                              |         | II    | 40            | 126          | 5            | 25200                    | 25200                         |                          | 2.75         | 69300               |                |
|                              |         | III   | 40            | 116          | 5            | 23200                    | 23200                         |                          | 2.75         | 63800               |                |
|                              |         | IV    | 11            | 106          | 5            | 5830                     | 5830                          |                          | 2.75         | 16033               |                |
|                              | XY-AB   | IV    | 3             | 53           | 5            | 795                      | 795                           |                          | 2.75         | 2186                |                |
| TOTAL                        |         |       |               |              | 82225        | 55025                    | 27200                         | .....                    | 151319       | 54400               |                |
| III-YEAR                     | XY-CD   | I     | 34            | 136          | 5            | 23120                    |                               | 23120                    | 2            |                     | 46240          |
|                              |         | II    | 34            | 126          | 5            | 21420                    | 21420                         |                          | 2.75         | 58905               |                |
|                              |         | III   | 34            | 116          | 5            | 19720                    | 19720                         |                          | 2.75         | 54230               |                |
|                              |         | IV    | 20            | 106          | 5            | 10600                    | 10600                         |                          | 2.75         | 29150               |                |
| TOTAL                        |         |       |               |              | 74860        | 51740                    | 23120                         | .....                    | 142285       | 46240               |                |
| IV-YEAR                      | XY-AB   | V     | 38            | 43           | 5            | 8170                     | 8170                          |                          | 2.75         | 22468               |                |
|                              |         | VI    | 33            | 33           | 5            | 5445                     | 5445                          |                          | 2.75         | 14974               |                |
|                              | XY-CD   | IV    | 40            | 106          | 5            | 21200                    | 21200                         |                          | 2.75         | 58300               |                |
|                              |         | V     | 66            | 96           | 5            | 31680                    | 31680                         |                          | 2.75         | 87120               |                |
|                              |         | VI    | 61            | 86           | 5            | 26230                    | 26230                         |                          | 2.75         | 72133               |                |
|                              |         | TOTAL |               |              |              |                          | 92725                         | 92725                    | 0            | .....               | 254995         |
| V-YEAR                       | XY-AB   | VII   | 28            | 23           | 5            | 3220                     | 3220                          |                          | 2.75         | 8855                |                |
|                              |         | VIII  | 23            | 13           | 5            | 1495                     | 1495                          |                          | 2.75         | 4111                |                |
|                              |         | VII   | 56            | 76           | 5            | 21280                    | 21280                         |                          | 2.75         | 58520               |                |
|                              | XY-CD   | VIII  | 51            | 66           | 5            | 16830                    | 16830                         |                          | 2.75         | 46283               |                |
|                              |         | IX    | 46            | 17           | 5            | 3910                     | 3910                          |                          | 2.75         | 10753               |                |
|                              |         | TOTAL |               |              |              |                          | 46735                         | 46735                    | 0            | .....               | 128522         |
| GRAND TOTAL                  |         |       |               |              | 379410       | 296860                   | 82550                         | .....                    | 816368       | 165100              |                |

|                                         |                                                                                     |
|-----------------------------------------|-------------------------------------------------------------------------------------|
| 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   |  |

| <p align="center"><u>YEARWISE DEVELOPMENT &amp; PRODUCTION SECTIONS</u></p> <p align="center">SECTION- SCALE - HOR 1 : 1000 &amp; VER 1: 500</p>                                                                                                                                          |                                                                                                                                                                                                                                                                                                                                                                                                    |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p><b><u>APPLICANT:</u></b><br/> <b>M/s.SRI KANNIAMMAL BLUE METALS,</b><br/> <b>PROPRIETOR, Mr.K.KUMAR</b><br/> <b>S/o.KANNAIYAN,</b><br/> <b>S.No.660/2A, 2B, 2C, 2D, 660/1A, 1B,</b><br/> <b>AARPAKKAM VILLAGE,</b><br/> <b>WALAJABAD TALUK,</b><br/> <b>KANCHEEPURAM DISTRICT.</b></p> | <p><b><u>LEASE APPLIED AREA:</u></b><br/> <b>S.F.No</b> : 162/1, 162/2A, 162/2B, 162/3, 162/4,<br/> 162/5A, 162/5B, 162/6, 162/7, 162/8,<br/> 162/10A1, 162/10A2, 162/10A3A,<br/> 162/10A3B &amp; 117/12A2, 144/1A, 144/2<br/> <b>EXTENT</b> : 3.38.58Hect<br/> <b>VILLAGE</b> : KUNDIYATHANDALAM &amp;<br/> POONATHANGAL<br/> <b>TALUK</b> : VEMBASAM,<br/> <b>DISTRICT</b> : TIRUVANNAMALAI.</p> |

| INDEX           |                                                                                       |
|-----------------|---------------------------------------------------------------------------------------|
| MINE LEASE AREA |  |
| SAFETY DISTANCE |  |
| ROUGH STONE     |  |
| GRAVEL          |  |
| PROPOSED BENCH  |  |

PLATE No-VIA

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.  
QUALIFIED PERSON



திருவிண்ணாமலை மாவட்டம், வெம்பாக்கம் அட்டம்,  
௧௩.78. பூணத்தீராங்கல் கிராம கிடுவாக அலுவலர் மன்ற  
மேம்படுத்தல்கள் தொடர்த்துக் கொண்ட வருத்தமும்.

திருவிண்ணாமலை மாவட்டம், வெம்பாக்கம் அட்டம்,  
௧௩.78. பூணத்தீராங்கல் கிராமம் புன்தேயி புல நிலைகள்:  
117/12A2-0420 , 144/1A-042.08 , 144/2- 040.5  
சீதக குறுகி 1.24.58 ஏக்கர் பரப்பளவில் உள்ள புலத்தை  
சிறிது சிமென்ட் 300 மீட்டர் சிறிதளவில் குழாய்க்கிகள்  
வழங்கும் குழாய்குழி பதிட்டோ, எம்மத்தித்தேர் கோந்தி  
அடிபட்டே தலங்குகோ, குழாய்க்கிகள் கூடும் குழி  
இடங்குகோ, பேருந்து நிலையமோ, தனியாக  
கூடாட்டங்குகோ, மன்றம் புன்தான தனங்குகோ துதும்  
கிண்கி ரீன கிராம உள்நகர் அகிரணையின் மீதம்  
குதாய அகிரகுதி ரீன கிண்கி மீதம் குதாஅத்திக்  
கொள்ளப்படுகிறது.

க. வெம்பாக்கம்  
கிராம தாலுகா அலுவலர்  
77, கருபல் கிராமம்  
76, குண்டியார்தண்டலம் கிராமம்  
வெம்பாக்கம் வட்டம்  
திருவிண்ணாமலை மாவட்டம்



PHOTOCOPY OF THE APPLIED LEASE AREA

Site photos in respect of Rough stone and gravel quarry lease in S.F.No's: 162/1, 162/2A, 162/2B, 162/3, 162/4, 162/5A, 162/5B, 162/6, 162/7, 162/8, 162/10A1, 162/10A2, 162/10A3A, 162/10A3B and 117/12A2, 144/1A, 144/2Patta Land - over an extent of ~~338.58~~ <sup>338.57</sup> hectares - Kundiyathandalam & Poonathangal village - Vembakkam Taluk - Tiruvannamalai District, Tamil Nadu State in belongs to M/s.Sri Kanniammal Blue Metals.



*[Handwritten Signature]*  
கிராம நிர்வாக அலுவலர்  
77, சுதேச சபை கட்டிடம்  
76, குண்டியாந்தலம் கிராமம்  
வெம்பாக்கம் வட்டம்.

## National Accreditation Board for Education and Training

### Certificate of Accreditation

#### Geo Technical Mining Solutions, Dharmapuri

5/1485-3, Salem Main Road, Elakkiyampatty, Dharmapuri, Tamil Nadu

The organization is accredited as **Category-A** under the QCI-NABET Scheme for Accreditation of EIA Consultant Organization, Version 3: for preparing EIA/EMP reports in the following Sectors.

| S. No | Sector Description                                             | Sector (as per) |           | Cat. |
|-------|----------------------------------------------------------------|-----------------|-----------|------|
|       |                                                                | NABET           | MoEFCC    |      |
| 1.    | Mining of minerals - including opencast and underground mining | 1               | 1 (a) (i) | A    |

**Note:** Names of approved EIA Coordinators and Functional Area Experts are mentioned in RAAC minutes dated January 24, 2024, posted on QCI-NABET website.

The Accreditation shall remain in force subject to continued compliance to the terms and conditions mentioned in QCI-NABET's letter of accreditation bearing no QCI/NABET/ENV/ACO/24/3142 dated Feb 19, 2024. The accreditation needs to be renewed before the expiry date by Geo Technical Mining Solutions, Dharmapuri following due process of assessment.

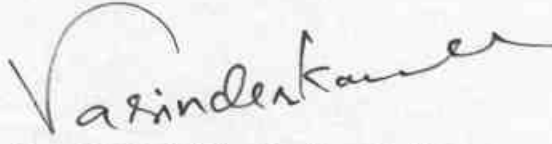
Issue Date  
Feb 19, 2024

Valid up to  
Dec 31, 2026



  
Mr. Ajay Kumar Jha  
Sr. Director, NABET

Certificate No.  
NABET/EIA/23-26/RA 0319

  
Prof (Dr) Varinder S Kanwar  
(CEO NABET)

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