

**DRAFT ENVIRONMENTAL IMPACT ASSESSMENT  
AND  
ENVIRONMENT MANAGEMENT PLAN  
FOR OBTAINING**

Environmental Clearance under EIA Notification – 2006

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

**“B1” CATEGORY – MINOR MINERAL – CLUSTER – NON-FOREST LAND**

**CLUSTER EXTENT = 15.10.0 hectares**

At

Irudukottai Village, Denkanikottai Taluk, Krishnagiri District,

Tamil Nadu State

ToR File No. 11945

ToR Identification No. TO25B0108TN5108832N, Dated.13/05/2025

NAME AND ADDRESS OF THE PROPOSED PROJECT PROPONENT

| Name and Address                                                                                                             | Extent & S.F.No.         | Mineral Production                                  |
|------------------------------------------------------------------------------------------------------------------------------|--------------------------|-----------------------------------------------------|
| M/s. Jayran Mines<br>D.No.HIG-301,<br>New Temple Land Hudco,<br>Rajaji Road, Hosur Taluk,<br>Krishnagiri District – 635 109. | 1.09.0Ha &<br>1160/1 (P) | Color Granite<br>30% Recovery<br>7500m <sup>3</sup> |

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

**GREEN LINK ANALYTICAL AND RESEARCH LABORATORY  
(INDIA) PVT LTD**



No.414/1, Tex Park Road, Coimbatore ,

Tamil Nadu Accreditation number Tc-6144,

Valid till 18.05.2025

**Baseline Study Period March to May, 2024**

**APRIL 2025**

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

**ToR File No. 11945**

**ToR Identification No. TO25B0108TN5108832N, dated.13.05.2025**

**M/s. Jayran Mines, Colour Granite Quarry.**

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

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

| <b>1.1</b> | <b>Terms of Reference</b> |                                                                                                                                                                                                                                                                                                               |                                                                                                                                             |
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|            | 1                         | The Project Proponent shall furnish the revised EMP based on the study carried out on impact of the dust & other environmental impacts due to proposed quarrying operations on the nearby agricultural lands for the life of the mine in the format prescribed by the SEAC considering the cluster situation. | A detailed Environment Management Plan has been prepared and provided in Tables 10.1 & 10.2 under Chapter X in the EIA report page 129-134. |
|            | 2                         | The PP is requested to revise the Mining plan because the school and village is located within 300m radius from the project site.                                                                                                                                                                             | The Revised mining plan will be submitted in the Final EIA report.                                                                          |
|            | 3                         | The PP shall submit the slope stability action plan incorporating the methodology of working in the remaining depth by maintaining the benches of adequate bench geometry in the hilly terrain (above ground level) along with a conceptual working plan for maintaining the safety aspects within the lease  | It's a Fresh quarry lease.                                                                                                                  |
|            | 4                         | The PP shall undertake Hydrogeology study considering                                                                                                                                                                                                                                                         | Detailed hydrogeological study was carried out. The results have been discussed Section                                                     |

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|  |   | nearby existing wells, Aquifers, Ground water & surface water levels etc., within the radius of 1km                                                 | 3.3.1 under Chapter III in the EIA report page 40-48.                                              |
|  | 5 | The study on impact of the proposed quarrying operations on the surrounding environment which includes water bodies, Odai etc., shall be furnished. | The impacts on water bodies, Odai, etc have been discussed in section 4.3 under chapter IV, pp 94. |

## 2. SEAC Standard Conditions

|   |                                                                                                                                                 |                                                                                                                       |                                                               |
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| 1 | In the case of existing/operating mines, a letter obtained from the concerned AD (Mines) shall be submitted and it shall include the following: |                                                                                                                       |                                                               |
|   | (i)                                                                                                                                             | Original pit dimension                                                                                                | It is a new lease area and the conditions are not applicable. |
|   | (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                                                               |                                                                                                                       | The VAO certificate is attached in the Annexure IV.           |

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|   | regarding the location of habitations within 300m radius from the periphery of the site                                                                                                                                                                                                                                                                                                                                                                                          |                                                                                                                                                                                                                 |
| 3 | The proponent is requested to carry out a survey and enumerate on the structures located within the radius of (i) 50 m, (ii) 100 m, (iii) 200 m, (iv) 300 m, (v) 500 m with details such as dwelling houses with number of occupants, whether it belongs to the owner or not, places of worship, industries, factories, sheds, etc with indicating the owner of the building nature of construction, age of the building, number of residents, their profession and income, etc. | The details regarding within the radius of 50m, 100m, 200m, 300m, 500m will be submitted in the final EIA report.                                                                                               |
| 4 | The PP shall submit a detailed hydrological report indicating the impact of proposed quarrying operations on the water bodies like lake, water tanks, etc are located within 1 km of the proposed quarry.                                                                                                                                                                                                                                                                        | Detailed hydrogeological study was carried out. The results have been discussed Section 3.2.3 under Chapter III, pp.40-48.                                                                                      |
| 5 | The proponent shall carry out Bio diversity study through reputed institution and the same shall be included in EIA Report.                                                                                                                                                                                                                                                                                                                                                      | The biodiversity study report 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 has enclosed in Annexure V.                                                                                                                                                                      |
| 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                                                                                                                     | This project does not require the Slope Stability Plan because the quarry was operated only above ground level and the details regarding the conceptual plan is given in the Figure 2.9 under Chapter II, p.22. |



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|    | 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.                                                                                                                                                                                         | It is a new lease area, the condition is not applicable.                                  |
| 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 submitted 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 controlled as well as no fly rock travel beyond 30 m from the blast site.                                                                                                                                                          | A conceptual design of blasting has been given in Section 2.6 under Chapter II, pp.17-25. |
| 11 | The EIA coordinators shall obtain and furnish the details of quarry/quarries operated by the proponent in the past, either                                                                                                                                                                                                                                                                                                                           | In Tamilnadu and any other state the proponent has no other quarries.                     |

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|    | in the same location or elsewhere in the State with video and photographic evidences.                                                                                                                                                                                                                                                                  |                                                                                                                                                              |
| 12 | If the proponent has already carried out the mining activity in the proposed mining lease area after 15.01.2016. then the proponent shall furnish the following details from AD/DD, mines,                                                                                                                                                             |                                                                                                                                                              |
| 13 | What was the period of the operation and stoppage of the earlier mines with last work permit issued by the AD/DD mines?                                                                                                                                                                                                                                | It is a new lease area and the condition is not applicable.                                                                                                  |
| 14 | Quantity of minerals mined out.                                                                                                                                                                                                                                                                                                                        |                                                                                                                                                              |
|    | <ul style="list-style-type: none"> <li>Highest production achieved in any one year</li> </ul>                                                                                                                                                                                                                                                          |                                                                                                                                                              |
|    | Detail of approved depth of mining.                                                                                                                                                                                                                                                                                                                    |                                                                                                                                                              |
|    | <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 lease 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 Imagery/Toposheet, topographic sheet, geomorphology, lithology and geology of the mining lease area should be provided. Such an Imagery of the proposed area should clearly show the land use and other ecological features of the study area (core and buffer zone). | All corner coordinates of the mine lease area have been superimposed on a high-resolution Google Earth Image, as shown in Figure 2.4 under Chapter II, p.13. |
| 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.                                                                                                 |

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| 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 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 colour granite were calculated based on cross-section method by plotting sections to cover the maximum lease area for the proposed project.<br>The plate used for reserve estimation has been presented in Figure 2.8 results of geological resources and reserves have been shown in Table 2.3. under Chapter II, pp.17 & 19. |
| 19 | The Project Proponent shall provide the Organization chart indicating the appointment of various statutory officials and other competent persons to be appointed as per the provisions of Mines Act, 1952 and the MMR, 1961 for carrying out the quarrying operations scientifically and systematically in order to ensure safety and to protect the environment. | Details of manpower required for this project have been given in Table 2.11 under Chapter II, p.25.                                                                                                                                                                                                                                                          |
| 20 | The Project Proponent shall conduct the hydro-geological study considering the contour map of the water table detailing the number of ground water pumping & open wells, and surface water bodies such as rivers, tanks, canals, ponds etc. within 1 km (radius) along with the collected water level data for both monsoon and non-monsoon                       | Detailed hydrogeological study was carried out. The results have been discussed Section 3.3.1 under Chapter III, pp. 40-48.                                                                                                                                                                                                                                  |

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|    | seasons from the PWD/ TWAD so as to assess the impacts on the wells due to mining activity. Based on actual monitored data, it may clearly – be shown whether working will intersect groundwater, Necessary data and documentation in this regard may be provided.                                                                                                                                                                       |                                                                                                                                                                                                                                                       |
| 21 | The proponent shall furnish the baseline data for the environmental and ecological parameters with regard to surface water/ground water quality, air quality, soil quality & flora/fauna including traffic/vehicular movement study.                                                                                                                                                                                                     | The baseline data were collected for the environmental components including land, soil, water, air, noise, biology, socio-economy, and traffic and the results have been discussed under Chapter III, pp. 27-92.                                      |
| 22 | The Proponent shall carry out the Cumulative impact study due to mining operations carried out in the quarry specifically with reference to the specific environment in terms of soil health, biodiversity, air pollution, water pollution, climate change and flood control & health impacts. Accordingly, the Environment Management plan should be prepared keeping the concerned quarry and the surrounding habitations in the mind. | Results of cumulative impact study due to mining operations are given in Section 7.4 under Chapter VII, pp.120-122.                                                                                                                                   |
| 23 | Rain water harvesting management with recharging details along with water balance (both monsoon & non-monsoon) be submitted.                                                                                                                                                                                                                                                                                                             | As part of rainwater harvesting measures, the rain water from garland drainage system will be diverted to nearby check dams after treating the water in settling tanks. The detailed rain water harvesting report Will be submitted final EIA report. |
| 24 | Land use of the study area delineating forest area, agricultural land, gazing land, wildlife sanctuary, national park, migratory routes of                                                                                                                                                                                                                                                                                               | Land use of the study area delineating forest area, agricultural land2grazing land, wildlife sanctuary, national park,                                                                                                                                |

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|    | 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.                                                                                                                 | migratory routes of fauna, water bodies, human settlements and other ecological features have been discussed in Section 3.1, under Chapter III pp.28-33. The details of surrounding sensitive ecological features have been provided in Table 3.38 under Chapter III, p.90. Land use plan of the project area showing pre- operational, operational and post- operational phases are discussed in Table 2.7 under Chapter II, p.20. |
| 25 | Details of the land for storage of Overburden/Waste Dumps (or) Rejects outside the mine lease. such as extent of land area, distance from mine lease' its land use, R&R issues. If any, should be provided.                                                                                                                                                                                                  | This condition is not applicable to this project because no dumps have been proposed outside the lease area.                                                                                                                                                                                                                                                                                                                        |
| 26 | Proximity to Areas declared as 'Critically Polluted, (or) the project areas which attracts the court restrictions for mining operations. Should also be indicated and where so required. Clearance certifications from the prescribed Authorities, such as the TNPCB (or) Dept. of Geology and Mining should be secured and furnished to the effect that the proposed mining activities could be considered. | Not Applicable.<br>Project area / Study area is not declared in 'Critically Polluted' Area and does not come under 'Aravalli Range.                                                                                                                                                                                                                                                                                                 |
| 27 | Description of water conservation measures proposed to be adopted in the Project should be given. Details of rainwater harvesting proposed in the Project, if any, should be provided.                                                                                                                                                                                                                       | As part of rainwater harvesting measures, the rain water from garland drainage system will be diverted to nearby check dams after treating the water in settling tanks. The detailed rain water harvesting report Will be submitted in final EIA report.                                                                                                                                                                            |

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| 28 | Impact on local transport infrastructure due to the project should be indicated.                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | The traffic density study is given in EIA report in Section 3.8, under Chapter III, pp.88-89.                                                                                                                   |
| 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 3.6 under Chapter III, pp.62-79.                                                                      |
| 30 | A detailed mine closure plan for the proposed project shall be included in EIA/EMP report which should be site-specific.                                                                                                                                                                                                                                                                                                                                                                                                                                      | A progressive mine closure plan has been attached with the approved mining plan report in Annexure III. The budget details for the progressive mine closure plan are shown in Table 2.8 under Chapter II, p.21. |
| 31 | As a part of the study of flora and fauna around the vicinity of the proposed site, the EIA coordinator shall strive to educate the local students on the importance of preserving local flora and fauna by involving them in the study, wherever possible.                                                                                                                                                                                                                                                                                                   | The EIA coordinator and the FAE for ecology and biodiversity visited the study area and educated the local students about the importance of protecting the biological environment.                              |
| 32 | The purpose of green belt around the project is to capture the fugitive emissions, carbon sequestration and to attenuate the noise generated, in addition to improving the aesthetics. A wide range of indigenous plant species should be planted as given in the appendix-I in consultation with the DFO, State Agriculture University and local school/college authorities. The plant species with dense/moderate canopy of native origin should be chosen. Species of small/medium/tall trees alternating with shrubs should be planted in a mixed manner. | A detailed greenbelt development plan has been provided in Section 4.6 under Chapter IV, pp.101-105.                                                                                                            |

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| 33 | Taller/one year old Saplings raised in appropriate size of bags, preferably eco-friendly bags should be planted as per the advice of local forest authorities, botanist/Horticulture with regard to site specific choices. The proponent shall earmark the greenbelt area with GPS coordinates all along the boundary of the project site with at least 3 meters wide and in between blocks in an organized manner. | The FAE of ecology and biodiversity has advised the project proponent that saplings of one year old raised in the eco- friendly bags should be purchased and planted with the spacing of 3 m between each plant around the proposed project area as per the advice of local forest authorities/botanist. |
| 34 | A Disaster management plan shall be prepared and included in the EIA/EMP Report for the complete life of the proposed quarry (or) till the end of the lease period.                                                                                                                                                                                                                                                 | A disaster management plan for the project has been provided in Section 7.3 under Chapter VII, pp.118-119.                                                                                                                                                                                               |
| 35 | A Risk Assessment and management plan shall be prepared and included in the EIA/EMP Report for the complete life of the proposed quarry (or) till the end of the lease period.                                                                                                                                                                                                                                      | A risk assessment plan for the project has been provided in Section 7.2 under Chapter VII, pp.115-118.                                                                                                                                                                                                   |
| 36 | Occupational Health impacts of the Project should be anticipated and the proposed preventive measures spelt out in detail. Details of pre-placement medical examination and periodical medical examination schedules should be incorporated in the EMP. The project specific occupational health mitigation measures with required facilities proposed in the mining area may be detailed.                          | Occupational health impacts of the project and preventive measures have been discussed in detail in Section 4.8 under Chapter IV, pp.106-107.                                                                                                                                                            |
| 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                                                                                                                                                                                                                                                 | 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                                                                                                                                                   |

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|    | measures should be detailed along with budgetary allocations.                                                                                                                                                                                                                                                                                         | Chapter VIII, pp.124-125.                                                                                                                                                                                                                             |
| 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 17 people directly as discussed in Section 8.1 under Chapter VIII, pp.123. |
| 39 | Details of litigation pending against the project, if any, with direction /order passed by any Court of Law against the Project should be given.                                                                                                                                                                                                      | No litigation is pending in any court against this project.                                                                                                                                                                                           |
| 40 | Benefits of the Project if the Project is implemented should be spelt out. The benefits of the Project shall clearly indicate environmental, social, economic, employment potential, etc.                                                                                                                                                             | Benefits of the project details have been given under Chapter VIII, pp.123-126.                                                                                                                                                                       |
| 41 | If any quarrying operation were carried out in the proposed quarrying site for which now the EC is sought, the Project Proponent shall furnish the detailed compliance to EC conditions given in the previous EC with the site photographs which shall duly be certified by MoEF & CC, Regional Office, Chennai (or) the concerned DEE/TNPCCB.        | It is a new lease area, the condition is not applicable.                                                                                                                                                                                              |
| 42 | The PP Shall prepare the EMP for the entire life/lease period of mine and also Furnish the sworn affidavit starting to Abide the EMP for the entire life of mine.                                                                                                                                                                                     | A detailed environment management plan has been prepared following the suggestion made by SEAC, as shown in Chapter X, pp.127-135. The sworn affidavit stating to abide the EMP for the                                                               |



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|    |                                                                                                                                                                                                                                                                                | 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. | The EIA report has been prepared keeping in mind the fact that concealing any factual information or submission of false/fabricated data and failure to comply with any of the conditions mentioned above may lead to withdrawal of this terms of reference besides attracting penal provisions in the Environment (Protection) Act, 1986. |

### 3. SEIAA Standard Conditions:

|   | <b>Cluster Management Committee</b>                                                                                                                                                 |                                                                                                                                                                                                                                                               |
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| 1 | Cluster Management Committee shall be framed which must include all the proponents in the cluster as members including the existing as well as proposed quarry.                     | A cluster management committee including all the proponents of the colour granite quarrying projects within the cluster of 500 m radius will be constituted for the effective implementation of green belt development plan, water sprinkling, blasting, etc. |
| 2 | The members must coordinate among themselves for the effective implementation of EMP as committed including Green Belt Development, Water sprinkling, tree plantation, blasting etc | The members of the cluster management committee will be instructed to carry out EMP in coordination.                                                                                                                                                          |
| 3 | The List of members of the committee formed shall be submitted to AD/Mines before the execution of mining lease and the same shall be updated every year to the AD/Mines.           | The list of members of the committee formed will be submitted to AD/Mines before the execution of mining lease.                                                                                                                                               |
| 4 | Detailed Operational Plan must be submitted which must include the blasting frequency                                                                                               | All the information has been discussed in Section 2.6 under Chapter II, pp.17-25.                                                                                                                                                                             |

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|   | with respect to the nearby quarry situated in the cluster, the usage of haul roads by the individual quarry in the form of route map and network.                                                                                                                             |                                                                                                                                                                                                                                                                                                      |
| 5 | The committee shall deliberate on risk management plan pertaining to the cluster in a holistic manner especially during natural calamities like intense rain and the mitigation measures considering the inundation of the cluster and evacuation plan.                       | It will be informed to the committee.                                                                                                                                                                                                                                                                |
| 6 | The Cluster Management Committee shall form Environmental Policy to practice sustainable mining in a scientific and systematic manner in accordance with the law. The role played by the committee in implementing the environmental policy devised shall be given in detail. | It will be advised to the cluster management committee to practice sustainable mining in a scientific and systematic manner in accordance with the law. The role played by the committee in implementing the environmental policy devised will be given in detail.                                   |
| 7 | The committee shall furnish action plan regarding the restoration strategy with respect to the individual quarry falling under the cluster in a holistic manner.                                                                                                              | A proper action plan regarding the restoration will be followed by the committee.                                                                                                                                                                                                                    |
| 8 | The committee shall deliberate on the health of the workers/staff involved in the mining as well as the health of the public.                                                                                                                                                 | The information on the health of the workers and the local people will be updated periodically.                                                                                                                                                                                                      |
|   | <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 under Chapter IV, pp.101-105. |

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| 10 | Impact on soil flora & vegetation around the project site.                                                                                                                                                                                        | The details on flora have been provided in Section 3.5 under Chapter III, pp.63-86. There is no schedule I species of animals observed within study area as per Wildlife Protection Act, 1972 and no species falls in vulnerable, endangered or threatened category as per IUCN. There is no endangered red list species found in the study area. |
| 11 | Details of type of vegetations including no. of trees & shrubs within the proposed mining area shall be given and if so, transplantation of such vegetations all along the boundary of the proposed mining area shall committed mentioned in EMP. | Details of vegetation in the lease area have been provided in Section 3.6 under Chapter III, pp. 62-79. Details about transplantation of plants have been provided in Section 4.6 under Chapter IV, pp.101-105.                                                                                                                                   |
| 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 details have been provided in Section 3.6 under Chapter III, pp. 62-79 and measures have been provided in Section 4.6 under Chapter IV, pp. 101-105.                                                                                                                                                                               |
| 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, pp.93-108.                                                                                                                                                     |
| 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, p.103.                                                                                                                                                                                                                                          |
|    | <b>Forests</b>                                                                                                                                                                                                                                    |                                                                                                                                                                                                                                                                                                                                                   |
| 15 | The project proponent shall study on impact of mining on Reserve forests free ranging                                                                                                                                                             | The project proponent shall do barbed wire fencing work and develop a green                                                                                                                                                                                                                                                                       |

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|    | wildlife.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | belt around the lease area to prevent wildlife from entering the 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, pp101-105.                                                                                      |
| 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, pp. 101-105.                                                                       |
| 18 | The Environmental Impact Assessment should study impact on protected areas, Reserve Forests, National parks, corridors and wildlife pathways, near project site.                                                                                                                                                                                                                                                                                                                                                   | The details of protected areas, National Parks, Corridors and Wildlife pathways near project site and the list of environmentally sensitive areas have been provided in Table 3.38 under Chapter III, p.90. |
|    | <b>Water Environment</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                                                                                                                                                                                             |
| 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. | Detailed hydrogeological study was carried out. The results have been discussed Section 3.3.1 under Chapter III, pp.40-48.                                                                                  |
| 20 | Erosion control measures.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | Garland drainage structures will be constructed around the lease area to                                                                                                                                    |

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|     |                                                                                                                                                                                                                                                                      | control the erosion, as discussed in Section 4.3 under Chapter IV, pp.94.                                                                                                |
| 21  | Detailed study shall be carried out in regard to impact of mining around the proposed mine lease area on the nearby villages, waterbodies/rivers & any ecological fragile areas.                                                                                     | The matter has been discussed under Chapter IV, pp.93-108.                                                                                                               |
| 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 has been discussed in Section 3.6 under Chapter III, pp. 62-79.                                                          |
| 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 have discussed in Chapter IV, pp. 93-108.                                                             |
| 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 sits possible land form changes visual and aesthetic impacts. | The impact of the proposed project on aquatic plants and animals in water bodies has been discussed in Section 4.6 under Chapter IV, pp. 101-105.                        |
| 25. | The Terms of Reference should specifically study impact on soil health, soil erosion, the soil physical, chemical components.                                                                                                                                        | The impact of mining on soil environment has been discussed in Section 4.2 under Chapter IV, p.94.                                                                       |
| 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, pp.94.                                                                  |
| 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 10 m below the local ground level, the temperature will increase by |

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|    |                                                                                                                                                                                                                                                                               | 0.25 <sup>0</sup> C at the depth of mining.                                                                                                                                                                                                                              |
|    | b) Bio-geochemical processes and its foot prints including Environmental stress                                                                                                                                                                                               | No, Bio-geochemical processes and its foot prints including environmental stress are anticipated and at the end of life of mine the proposed quarry shall be left as an artificial reservoir structure and allowed to collect rain water and shall enrich the ecosystem. |
|    | c) Sediment geochemistry in the surface streams                                                                                                                                                                                                                               | The details regarding sediment geochemistry is discussed in the Table 3.4 under Chapter III, p.36.                                                                                                                                                                       |
|    | <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 have been given under Chapter IV, pp.93-108.                                                                                                                                                                   |
|    | <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, pp.101-105.                                                                                                                                        |
| 30 | The Environmental Impact Assessment should study impact on climate change, temperature rise, pollution and above soil & below soil carbon stock.                                                                                                                              | The matter has been discussed in Chapter IV, pp. 93-108.                                                                                                                                                                                                                 |
| 31 | Impact of mining on pollution leading to GHGs emissions and the impact of the same on the local livelihood.                                                                                                                                                                   | The information about CO <sub>2</sub> emission has been added to Section 4.6 under Chapter IV, pp.101-105.                                                                                                                                                               |
|    | <b>Mine Closure Plan</b>                                                                                                                                                                                                                                                      |                                                                                                                                                                                                                                                                          |

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| 32 | Detailed Mine closure plan covering the entire mine lease period as per precise area communication order issued.                                                                                                                                                                                                                                                                           | A progressive mine closure plan has been attached with the approved mining plan report in Annexure III. The budget details for the progressive mine closure plan are shown in Table 2.8 under Chapter II, p.21. |
|    | <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 under Chapter X, pp.127-135.                                                                                                                              |
| 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.                                                                                                                                                                                                                     | A detailed Environment Management plan has been given in Tables 10.1 & 10.2 under Chapter X, pp.129-134.                                                                                                        |
|    | <b>Risk Assessment</b>                                                                                                                                                                                                                                                                                                                                                                     |                                                                                                                                                                                                                 |
| 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 provided in Section 7.2 under Chapter VII, pp.115-118.                                                                                        |
|    | <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/unfavorable accidents in & around the proposed mine lease area due to the proposed method of mining activity & its related activities covering the entire mine lease period as per precise area communication order issued. | The disaster management plan for this project has been provided in Section 7.3 under Chapter VII, pp.118-119.                                                                                                   |
|    | <b>Others</b>                                                                                                                                                                                                                                                                                                                                                                              |                                                                                                                                                                                                                 |

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| 37 | The project proponent shall furnish VAO certificate with reference to 300 m radius regard to approved habitations, schools, Archaeological sites, structures, railway lines, roads, water bodies such as streams, odai, vaari, canal, river, lake pond, tank etc.                                                   | The VAO certificate of 300 m radius have been attached in the attached in the Annexure IV.      |
| 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 attached in Final EIA report.        |
| 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 matter on plastic waste management has been given in Section 7.5 under Chapter VII, pp.122. |

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

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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 is not a violation category project. This proposal falls under B1 category. |
| 1.2. | A copy of the document in support of the fact that the proponent is the rightful lessee of the                                                                                                                                                                                                                                         | The proposed site for quarrying is a private land. A copy of the document                        |



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|      | mine should be given.                                                                                                                                                                                                                                                                                                          | showing that the proponent is the rightful lessee has been enclosed along with the approved mining plan in Annexure III.                                                              |
| 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 the documents are 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). | All corner coordinates of the mine lease area have been superimposed on a high-resolution Google Earth Image, as shown in Figure 2.4 under Chapter II, p.13.                          |
| 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, as shown in Chapter III.                                                  |
| 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 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                                                                                                                                                                                                                                                 | The proponent has framed Environmental Policy and the same has                                                                                                                        |

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|      | <p>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.</p> | <p>been discussed in Section 10.1 under Chapter X, pp.127-128.</p>                                                                                                                                                                                                                                                                                                                                                                                                          |
| 1.8. | <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 colour granite formation is a hard, compact and homogeneous body. The height and width of the bench will be maintained as 5m with 90° 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> |
| 1.9. | <p>The study area will comprise of 10 km zone around the mine lease from lease periphery and the data contained in the EIA such as waste generation etc., should be for the life of the mine / lease period.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | <p>The study area considered for this study is of 5 km radius for air, soil, water, and noise level sample collections, while the study area is 10 km radius for ecology and biodiversity studies and all data contained</p>                                                                                                                                                                                                                                                |

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|       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | in the EIA report such as waste generation etc., is 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.                                                                                               | Land use of the study area delineating forest area, agricultural land, grazing land, wildlife sanctuary, national park, migratory routes of fauna, water bodies, human settlements and other ecological features has been discussed in Section 3.1 under Chapter III, pp.28-33 The details of surrounding sensitive ecological features have been provided in Table 3.38 under Chapter III, p.90. Land use plan of the project area showing pre- operational, operational and post- operational phases are discussed in Table 2.7 under Chapter II, p.20. |
| 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                                                                                                                                                                                                                                                                                                                                                         | It is not applicable as no dumps have been proposed outside the lease area. The entire quarried out colour granite will be transported to the needy customers.                                                                                                                                                                                                                                                                                                                                                                                            |
| 1.12. | 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 | It is not applicable as there is no forest land involved within the proposed project area. The details have been discussed in Table 3.38 under Chapter III, p.90.                                                                                                                                                                                                                                                                                                                                                                                         |

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|       | representative of the State Forest Department to assist the 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.                                                                 | It is not applicable as the proposed project area does not involve any forest land.                                                                                                                                                                                                                                                                                  |
| 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><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). Thus, the rights of Traditional Forest Dwellers will not be compromised on account of the project. |
| 1.15. | The vegetation in the RF / PF areas in the study area, with necessary details, should be given.                                                                                                                                                                                                                                       | No Reserve Forest is found within the study area. The details of reserve forest within 10km have been discussed Table 3.38 under Chapter III, p.90. Flora and Fauna vegetation details are given in section 3.6.1 and 3.6.2 under chapter III, p.63-79.                                                                                                              |
| 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 from the periphery of the project area. Information regarding wildlife /protected area within 10km has been given in Table 3.38 under Chapter III, p.90. Flora and Fauna vegetation details are given in section 3.6.1 and 3.6.2 under chapter III, p.63-79.                                                                 |

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| 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                                                                                                                                                                                             | The details of National Parks, Biosphere Reserves, Wildlife Corridors, and Tiger/ Elephant Reserves within 10 km radius from the periphery of the project area has been given in Table 3.38 under Chapter III, p.90. |
| 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 3.6 under Chapter III, pp.63-79.                                                            |
| 1.19. | Proximity to Areas declared as 'Critically Polluted' or the Project areas likely to come under the 'Aravalli Range', (attracting court                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | Not Applicable.<br>Project area / Study area is not declared in 'Critically Polluted' Area and does not                                                                                                              |

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|       | 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.                                                                                                                                                                                                                                                                                                                                                                                                                                  | come under 'Aravalli Range.                                                                                                                                          |
| 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>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- | Not Applicable.<br>There are no approved habitations of SCs/STs and other weaker sections in the lease area. Therefore, R&R Plan / Compensation Plan for the Project |

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|       | 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. | Baseline data were collected for the period of October 2023 - December 2023 as per CPCB notification and MoEF & CC Guidelines. Primary baseline data and the results have been included in Sections 3.1-3.9 under Chapter III, pp. 27-92. |
| 1.23. | Air quality modelling should be carried out for prediction of impact of the project on the air quality of the area. It should also take into account the impact of movement of vehicles for transportation of mineral. The details of the model used and input parameters used for modelling should be provided. The air quality contours may be shown on a location map clearly indicating the location of the site, location of sensitive receptors, if any, and the habitation. The wind roses showing                                                                                                                                                                                                                                                                                                                                                         | Air quality modelling for prediction of incremental GLCs of pollutants was carried out using AERMOD view 11.2.0. The model results have been given in Section 4.4 under the Chapter IV, pp.95-99.                                         |

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|       | 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 2.9 under Chapter II, p.22.                                                                                                                                                                                                                                              |
| 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. Drinking water will be sourced from the approved 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. The mine closure plan has been prepared for converting the excavated pit into rain water harvesting structure and serve as water reservoir for the project village during draught season. |
| 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 discussed in Section 4.3 under Chapter IV, pp. 94.                                                                                                                                                                                                       |
| 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                                             | Not Applicable.<br>The ground water table is found at the depth of 60 m below ground level. The ultimate depth of quarry is 6 m BGL.                                                                                                                                                                                                                                    |



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|       | 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.                                                                                                                                                                | Therefore, the mining activity will not intersect the ground water table. Data regarding the occurrence of groundwater table have been provided in Section 3.3 under Chapter III, pp.36-48. |
| 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.                                                                                                                                                                                                                                                                                                                                                                                                          | Not Applicable.<br>There are no streams, seasonal or other water bodies passing within the project area. Therefore, no modification or diversion of water bodies is anticipated.            |
| 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.                                                                                                                                                                                                                                                                                                                                                                                                                                    | The highest elevation of the project area is 925 m AMSL. Ultimate depth of the mine is 6m BGL. Depth to the water level in the area is 60 m BGL.                                            |
| 1.31. | 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 | Greenbelt development plan has been given in Section 4.6 under Chapter IV, pp.101-105.                                                                                                      |

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|       | 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. | 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 have been provided in Section 3.8 under Chapter III, p.88-89. |
| 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 will be provided to the mine workers after the grant of quarry lease and the same has been discussed in Section 2.6 under Chapter II, p.25.                                                                                                                                      |
| 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 Table 2.8 under Section 2.6. under Chapter II, p.21.                                                                                                                                                                              |
| 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                                                                                                                                                                                                                                                                                                                                                                                    | Occupational health impacts of the project and preventive measures have been explained in detail in Section 4.8 under Chapter IV, pp.106-107.                                                                                                                                                                      |

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|       | 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.                                                         | No public health implications are anticipated due to this project. Details of CSR and CER activities have been discussed in Sections 8.6 and 8.7 under Chapter VIII, pp.124-125.                                                                     |
| 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 17 people directly as discussed in Section 8.1 under Chapter VIII, p.123. |
| 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 been prepared and provided in Tables 10.1 & 10.2 under Chapter X, pp.129-134.                                                                                                                             |
| 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 outcome of public hearing will be submitted during the final EIA report.                                                                                                                                                                         |
| 1.40. | Details of litigation pending against the                                                                                                                                                                                                                                                 | No litigation is pending in any court                                                                                                                                                                                                                |

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|       | project, if any, with direction /order passed by any Court of Law against the Project should be given.                                                                                    | 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.2,51,30,000/-<br>CER Cost is Rs. 6,00,000/-<br>In order to implement the environmental protection measures, an amount of Rs.3900810 as capital cost and recurring cost as Rs.1073410 as recurring cost/annum is proposed considering present market price considering present market scenario for the proposed project.<br>After the adjustment of 5% inflation per year, the overall EMP cost for 5 years will be Rs.9832079, as shown in Tables 10.1 & 10.2 under Chapter X, pp.129-134. |
| 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 provided in Section 7.3 under Chapter VII, pp.118-119.                                                                                                                                                                                                                                                                                                                                                                                                 |
| 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 details have been given under Chapter VIII, pp.123-125.                                                                                                                                                                                                                                                                                                                                                                                                                               |
| 1.44. | 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                                                                                                      | List of tables and source of the data collected have been mentioned.                                                                                                                                                                                                                                                                                                                                                                                                                                          |

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|    | 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.                                                                                                                                                                                                                                        | Original Baseline monitoring report will be submitted in 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 final EIA report.                                                                                       |
| g) | While preparing the EIA report, the instructions for the Proponents and instructions for the Consultants issued by MoEF & CC vide O.M. No. J-11013/41/2006-IA. II(I) dated 4th August, 2009, which are available on the website of this Ministry, should be followed.                                                                                                                                                                                                                    | Instructions issued by MoEF & CC O.M. No. J-11013/41/2006-IA. II (I) dated 4th August, 2009 have been followed while preparing the EIA report. |
| h) | Changes, if any made in the basic scope and project parameters (as submitted in Form-I and the PFR for securing the TOR) should be brought to the attention of MoEF & CC with reasons for such changes and permission should be sought, as the TOR may also have to be altered. Post Public Hearing changes in structure and content of the draft EIA/EMP (other than modifications arising out of the P.H. process) will entail conducting the PH again with the revised documentation. | No changes are made in the basic scope and the project parameters.                                                                             |

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| 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. | It is a new lease area, the condition is not applicable.                                                             |
| j) | The EIA report should also include (i) surface plan of the area indicating contours of main topographic features, drainage and mining area, (ii) geological maps and sections and (iii) sections of the mine pit and external dumps, if any, clearly showing the land features of the adjoining area.                                            | All the plans including surface & geological plans, and progressive closure plan have been included in Annexure III. |

#### **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. This is not a violation category project. This proposal falls under B1 category.                                                                                                   |
| 2. | A copy of the document in support of the fact that the proponent is the rightful lessee of the mine should be given.                                                                                                                                                                                                                   | The proposed site for quarrying is a private land. A copy of the document showing that the proponent is the rightful lessee has been enclosed along with the approved mining plan in Annexure III. |
| 3. | All documents including approved mine plan, EIA and Public Hearing should be                                                                                                                                                                                                                                                           | All the documents related to mining plan, in the name of the lease.                                                                                                                                |

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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, as shown in Figure 2.3 under Chapter II, p.13.                          |
| 5. | Information should be provided in Survey of India Toposheet in 1:50,000 scale indicating geological map of the area, geomorphology of land forms of the area, existing minerals and mining history of the area, important water bodies, streams and rivers and soil characteristics.                                           | Toposheets of Survey of India have been used for showing sampling locations of air, soil, water, and noise, as shown in Chapter III.                                                  |
| 6. | Details about the land proposed for mining activities should be given with information as to whether mining conforms to the land use policy of the State; land diversion for mining should have approval from State land use board or the concerned authority.                                                                 | The lease area was inspected by the officers of Department of Geology along with revenue officials and found that the land is fit for quarrying under the policy of State Government. |
| 7. | It should be clearly stated whether the proponent Company has a well laid down Environment Policy approved by its Board of Directors? If so, it may be spelt out in the EIA Report with description of the prescribed operating process/ procedures to bring into focus any infringement/                                      | The proponent has framed Environmental Policy and the same has been discussed in Section 10.1 under Chapter X, pp127-128.                                                             |

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|     | 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.                                                                                                                                                                                                            | It is an opencast quarrying operation proposed to operate in Manual method. The colour granite formation is a hard, compact and homogeneous body. The height and width of the bench will be maintained as 5m with 90 <sup>0</sup> bench angles. Quarrying activities will be carried out under the supervision of Competent Persons like Mines Manager, Mines Foreman and Mining Mate. Necessary permissions will be obtained from DGMS after obtaining Environmental Clearance. |
| 9.  | The study area will comprise of 10 km zone around the mine lease from lease periphery and the data contained in the EIA such as waste generation etc., should be for the life of the mine / lease period.                                                                                                                                                                                                                                                      | The study area considered for this study is of 5 km radius for air, soil, water, and noise level sample collections, while the study area is 10 km radius for ecology and biodiversity studies and all data contained in the EIA report such as waste generation etc., is for the life of the mine / Lease period.                                                                                                                                                               |
| 10. | Land use of the study area delineating forest                                                                                                                                                                                                                                                                                                                                                                                                                  | Land use of the study area delineating                                                                                                                                                                                                                                                                                                                                                                                                                                           |



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|     | <p>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>forest area, agricultural land, grazing land, wildlife sanctuary, national park, migratory routes of fauna, water bodies, human settlements and other ecological features has been discussed in Section 3.1 under Chapter III, pp.28-33. The details of surrounding sensitive ecological features have been provided in Table 3.38 under Chapter III, p.90. Land use plan of the project area showing pre-operational, operational and post-operational phases are discussed in Table 2.7 under Chapter II, p.20.</p> |
| 11. | <p>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&amp;R issues, if any, should be given</p>                                                                                                                                                                                                                                                                                                                                                                                                                                              | <p>It is not applicable as no dumps have been proposed outside the lease area. The entire quarried out colour granite will be transported to the needy customers.</p>                                                                                                                                                                                                                                                                                                                                                    |
| 12. | <p>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.</p> | <p>It is not applicable as there is no forest land involved within the proposed project area. The details have been discussed in Table 3.38 under Chapter III, p.90.</p>                                                                                                                                                                                                                                                                                                                                                 |

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| 13. | Status of forestry clearance for the broken-up area and virgin forestland involved in the Project including deposition of net present value (NPV) and compensatory afforestation (CA) should be indicated. A copy of the forestry clearance should also be furnished.                                                                 | It is not applicable as the proposed project area does not involve any forest land.                                                                                                                                                                                                                                                                                  |
| 14. | Implementation status of recognition of forest rights under the Scheduled Tribes and other Traditional Forest Dwellers (Recognition of Forest Rights) Act, 2006 should be indicated.                                                                                                                                                  | Not Applicable.<br><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). Thus, the rights of Traditional Forest Dwellers will not be compromised on account of the project. |
| 15. | The vegetation in the RF / PF areas in the study area, with necessary details, should be given.                                                                                                                                                                                                                                       | No Reserve Forest is found within the study area. The details of reserve forest within 10km have been discussed Table 3.38 under Chapter III, p.90. Flora and Fauna vegetation details are given in section 3.6.1 and 3.6.2 under chapter III, p.63-79.                                                                                                              |
| 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 from the periphery of the project area. Information regarding wildlife /protected area within 10km has been given in Table 3.38 under Chapter III, p.90. Flora and Fauna vegetation details are given in section 3.6.1 and 3.6.2 under chapter III, p.63-79.                                                                 |

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| 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                                                                                                                                                                                             | The details of National Parks, Biosphere Reserves, Wildlife Corridors, and Tiger/Elephant Reserves within 10 km radius from the periphery of the project area has been given in Table 3.38 under Chapter III, p.90. |
| 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 3.6 under Chapter III, pp.63-79.                                                           |
| 19. | Proximity to Areas declared as 'Critically Polluted' or the Project areas likely to come under the 'Aravalli Range', (attracting court                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | Not Applicable.<br>Project area / Study area is not declared in 'Critically Polluted' Area and does not                                                                                                             |

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

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|     | 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. | Baseline data were collected for the period of October 2023 - December 2023 as per CPCB notification and MoEF & CC Guidelines. Primary baseline data and the results have been included in Sections 3.1-3.9 under Chapter III, pp. 27-92. |
| 23. | Air quality modelling should be carried out for prediction of impact of the project on the air quality of the area. It should also take into account the impact of movement of vehicles for transportation of mineral. The details of the model used and input parameters used for modelling should be provided. The air quality contours may be shown on a location map clearly indicating                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | Air quality modelling for prediction of incremental GLCs of pollutants was carried out using AERMOD view 11.2.0. The model results have been given in Section 4.4 under the Chapter IV, pp.95-99.                                         |

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|     | 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. | The water requirement for the project, its availability and source have been provided in Table 2.9 under Chapter II, p.22.                                                                                                                                                                                                                                              |
| 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 water vendors.                                                    |
| 26. | Description of water conservation measures proposed to be adopted in the Project should be given. Details of rainwater harvesting proposed in the Project, if any, should be provided.                 | Part of the working pit will be allowed to collect rain water during the spell of rain. The water thus collected will be used for greenbelt development and dust suppression. The mine closure plan has been prepared for converting the excavated pit into rain water harvesting structure and serve as water reservoir for the project village during draught season. |
| 27. | Impact of the Project on the water quality, both surface and groundwater, should be assessed and necessary safeguard measures, if any required, should be provided.                                    | Impact studies and mitigation measures of water environment including surface water and ground water have been discussed in Section 4.3 under Chapter IV, pp. 94.                                                                                                                                                                                                       |

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| 28. | Based on actual monitored data, it may clearly be shown whether working will intersect groundwater. Necessary data and documentation in this regard may be provided. In case the working will intersect groundwater table, a detailed Hydro Geological Study should be undertaken and Report furnished. The Report inter-alia, shall include details of the aquifers present and impact of mining activities on these aquifers. Necessary permission from Central Ground Water Authority for working below ground water and for pumping of ground water should also be obtained and copy furnished. | Not Applicable.<br><br>The ground water table is found at the depth of 60 m below ground level. The ultimate depth of quarry is 6 m BGL. Therefore, the mining activity will not intersect the ground water table. Data regarding the occurrence of groundwater table have been provided in Section 3.3 under Chapter III, pp.37-48. |
| 29. | Details of any stream, seasonal or otherwise, passing through the lease area and modification / diversion proposed, if any, and the impact of the same on the hydrology should be brought out.                                                                                                                                                                                                                                                                                                                                                                                                      | Not Applicable.<br><br>There are no streams, seasonal or other water bodies passing within the project area. Therefore, no modification or diversion of water bodies is anticipated.                                                                                                                                                 |
| 30. | Information on site elevation, working depth, groundwater table etc. Should be provided both in AMSL and BGL. A schematic diagram may also be provided for the same.                                                                                                                                                                                                                                                                                                                                                                                                                                | The highest elevation of the project area is 925m AMSL. Ultimate depth of the mine is 6m BGL Depth to the water level in the area is 60 m BGL.                                                                                                                                                                                       |
| 31. | A time bound Progressive Greenbelt Development Plan shall be prepared in a tabular form (indicating the linear and quantitative coverage, plant species and time frame) and submitted, keeping in mind, the same will have to be executed up front on commencement of the Project. Phase-wise plan of plantation and compensatory                                                                                                                                                                                                                                                                   | Greenbelt development plan has been given in Section 4.6 under Chapter IV, pp.111-115.                                                                                                                                                                                                                                               |

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|     | <p>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>                                                                                                                                                           |                                                                                                                                                                                                                                                                                                                           |
| 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 Transportation study as per Indian Road Congress Guidelines.</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 have been provided in Section 3.8 under Chapter III, p.88-90.</p> |
| 33. | <p>Details of the onsite shelter and facilities to be provided to the mine workers should be included in the EIA Report.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                             | <p>Infrastructure &amp; other facilities will be provided to the mine workers after the grant of quarry lease and the same has been discussed in Section 2.6. under Chapter II, p.25.</p>                                                                                                                                 |
| 34. | <p>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</p>                                                                                                                                                                                                                                                                                                                                                                                                                   | <p>Progressive mine closure plan has been prepared for this project and is given in Table 2.8 under Section 2.6. under Chapter II, p.18.</p>                                                                                                                                                                              |



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|     | 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. | Occupational health impacts of the project and preventive measures have been explained in detail in Section 4.8 under Chapter IV, pp.106-107.                                                                                                        |
| 36. | Public health implications of the Project and related activities for the population in the impact zone should be systematically evaluated and the proposed remedial measures should be detailed along with budgetary allocations.                                                                                                                                                          | No public health implications are anticipated due to this project. Details of CSR and CER activities have been discussed in Sections 8.6 and 8.7 under Chapter VIII, pp.124-125.                                                                     |
| 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 17 people directly as discussed in Section 8.1 under Chapter VIII, p.123. |
| 38. | Detailed environmental management plan (EMP) to mitigate the environmental impacts which, should inter-alia include the impacts of change of land use, loss of agricultural and grazing land, if any, occupational health impacts besides other impacts specific to the proposed Project.                                                                                                  | A detailed Environment Management Plan has been prepared and provided in Tables 10.1 & 10.2 under Chapter X, pp.129-134.                                                                                                                             |
| 39. | Public Hearing points raised and commitment of the Project Proponent on the                                                                                                                                                                                                                                                                                                                | The outcome of public hearing will be submitted in final EIA report.                                                                                                                                                                                 |

|     |                                                                                                                                                                                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
|-----|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|     | 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.                                          | 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.2,51,30,000/-<br>CER Cost is Rs. 6,00,000/-<br>In order to implement the environmental protection measures, an amount of Rs.3900810 as capital cost and recurring cost as Rs.1073410 as recurring cost/annum is proposed considering present market price considering present market scenario for the proposed project.<br>After the adjustment of 5% inflation per year, the overall EMP cost for 5 years will be Rs.9832079, as shown in Tables 10.1 & 10.2 under Chapter X, pp.129-134. |
| 42  | A disaster management Plan shall be prepared and included in the EIA/EMP Report.                                                                                                          | The disaster management plan for this project has been provided in Section 7.3 under Chapter VII, pp.118-119.                                                                                                                                                                                                                                                                                                                                                                                                 |
| 43. | Benefits of the Project if the Project is implemented should be spelt out. The benefits of the Project shall clearly indicate environmental, social, economic, employment potential, etc. | Benefits of the project details have been given under Chapter VIII, pp.123-125.                                                                                                                                                                                                                                                                                                                                                                                                                               |
| 44. | <b>Besides the above, the below mentioned general points are also to be followed:</b>                                                                                                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| a)  | Executive Summary of the EIA/EMP                                                                                                                                                          | Executive summary has been enclosed as                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |

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

|    |                                                                                                                                                                                                                                                                                                                                                  |                                                                                                                      |
|----|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------|
|    | 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. | It is a new lease area, the condition is not applicable.                                                             |
| j) | The EIA report should also include (i) surface plan of the area indicating contours of main topographic features, drainage and mining area, (ii) geological maps and sections and (iii) sections of the mine pit and external dumps, if any, clearly showing the land features of the adjoining area.                                            | All the plans including surface & geological plans, and progressive closure plan have been included in Annexure III. |

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## **CHAPTER I**

### **INTRODUCTION**

#### **1.0 PREAMBLE**

Environmental Impact Assessment (EIA) study is a process used to identify the environmental, social and economic impacts of a project prior to decision-making. EIA systematically examines both beneficial and adverse consequences of the proposed project and ensure that these impacts are considered during the project designing. According to the Ministry of Environment and Forests, Govt. of India, EIA notification S.O. 1533(E) of 14<sup>th</sup> September 2006 and its subsequent amendments as per Gazette Notification S.O. 3977 (E) of 14<sup>th</sup> August 2018, all the mining projects are broadly classified into two categories, i.e., category A and category B, based on the spatial extent of the projects. The category B projects are further divided in to B1 and B2 on the basis of the guidelines issued of the Ministry of Environment and Forests. All mining projects included in category B1 require an EIA report for obtaining environmental clearance from the State Environment Impact Assessment Authority (SEIAA). As the proposed project falls within the cluster of quarries of overall extent of greater than 5 ha and less than 100 ha, the proposed project falls under the category B1 and the project requires preparation and submission of an EIA report after public consultation to SEIAA for obtaining environmental clearance.

In compliance with ToR obtained vide TOR File No.11945 and TOR Identification No. TO25B0108TN5108832N, dated.13/05/2025. This EIA report is prepared for the project proponent, M/s. Jayran Mines applied for Colour Granite quarry lease in the Govt Poramboke land falling in S.F.No.1160/1 (part) over an extent of 1.09.0ha in Irudukottai Village, Denkanikottai Taluk, Krishnagiri District and Tamil Nadu. Considering cumulative load of all the colour granite quarry project including one proposed quarries and five existing quarries falling in the cluster of 500 m radius from the periphery of the proposed project. The total extent of all the quarries in the cluster is 15.10.0ha. All the quarries in the cluster are shown in Figure 1.1.

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

The purpose of the report is to study baseline environmental conditions in and around the proposed project area for the period of **March - May 2024** according to the provisions of MoEF & CC Office Memorandum dated 29.08.2017 and MoEF & CC Notification, S.O. 996 (E) dated 10.04.2015.



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

| <b>Proposed Quarries</b>    |                           |                                                                            |                |                    |                                |
|-----------------------------|---------------------------|----------------------------------------------------------------------------|----------------|--------------------|--------------------------------|
| <b>Code</b>                 | <b>Name of the Lease</b>  | <b>S.F.No</b>                                                              | <b>Village</b> | <b>Extent (ha)</b> | <b>Lease Period</b>            |
| <b>P1</b>                   | M/s. Jayran Mines         | 1160/1 (P)                                                                 | Irudukottai    | 1.09.0             | Proposed Area                  |
| <b>Existing Quarries</b>    |                           |                                                                            |                |                    |                                |
| <b>E1</b>                   | M/s. Aryan Stones (P) Ltd | 1161/8, 1167/6                                                             | Irudukottai    | 1.40.0             | 30.07.2008<br>to<br>29.07.2028 |
| <b>E2</b>                   | M/s.Aryan Stones (P) Ltd  | 1158/3, 1158/6                                                             | Irudukottai    | 1.40.0             | 30.07.2008<br>to<br>29.07.2028 |
| <b>E3</b>                   | Tvl. Vaigai Granites      | 1155/1, 1156/3(P), 1156/5                                                  | Irudukottai    | 1.44.5             | 15.12.2013<br>to<br>14.12.2033 |
| <b>E4</b>                   | Thiru.D. Mathazhagan      | 1158/4,1158/5, 1162/1,1162/2, 1162/3,1162/4, 1162/5,1163/6, 1163/7,1165/1, | Irudukottai    | 6.55.0             | 03.03.2016<br>To<br>02.03.2025 |
| <b>E5</b>                   | Thiru.V. Jayaprakash      | 1158/8,1158/9, 1160/3A,1160/4, 1161/2(P),1161/3, 1161/4A(P) & 1166/5(P)    | Irudukottai    | 3.21.5             | 18.11.2015<br>To<br>17.11.2035 |
| <b>Total Cluster Extent</b> |                           |                                                                            |                | <b>15.10.0</b>     | ---                            |

**Source:**

DD Letter – Rc.No.986/2019/Mines dated 26.12.2023 **Note:** Cluster area is calculated as per MoEF & CC Notification – S.O. 2269 (E) Dated: 01.07.2016.

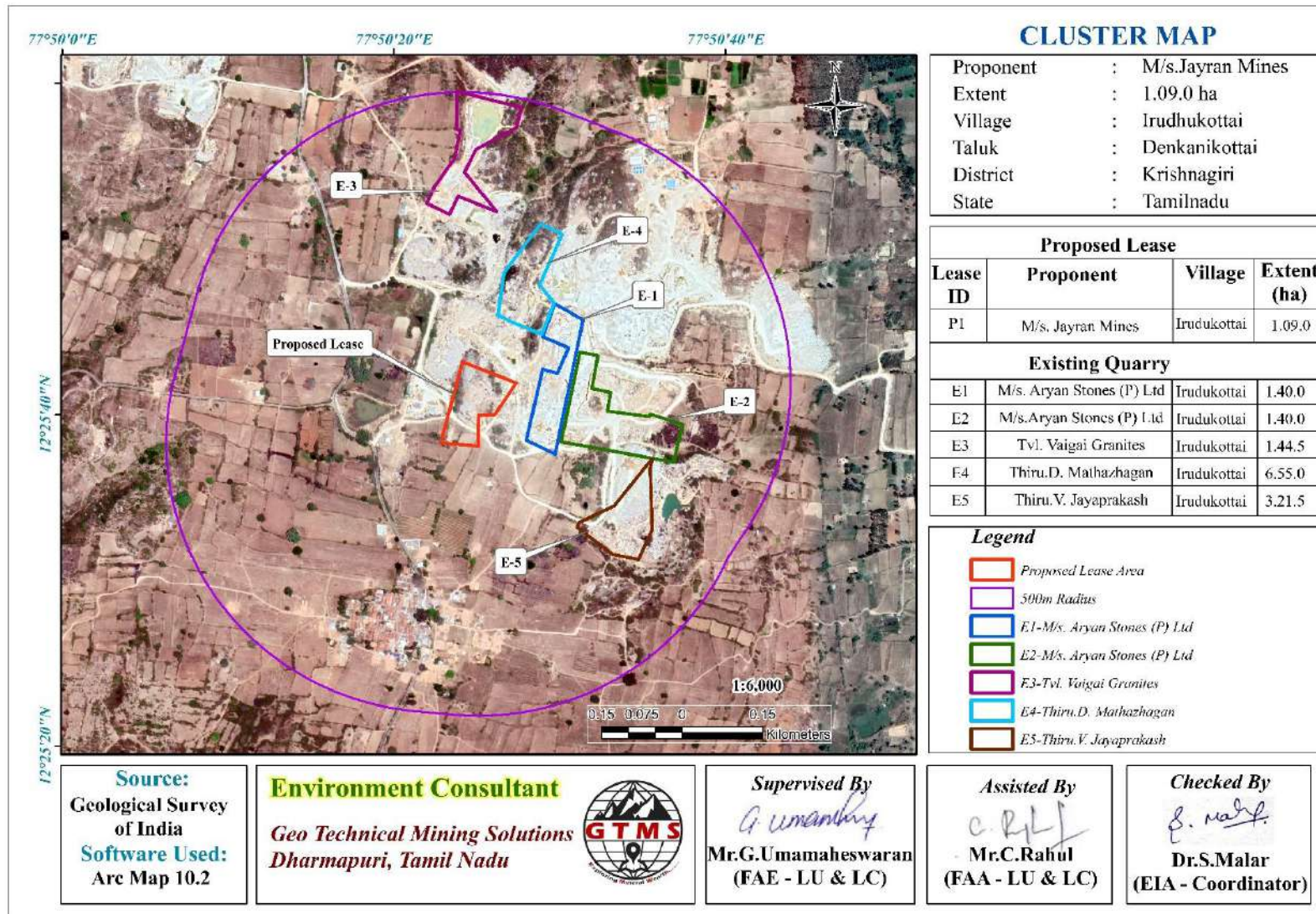


Figure 1.1 Location of Proposed and Existing Quarries in the Cluster of 500m Radius

## **1.2 ENVIRONMENTAL CLEARANCE**

The Environmental Clearance process for the project will comprise of four stages. These stages are given below:

- ❖ Screening
- ❖ Scoping
- ❖ Public consultation
- ❖ Appraisal

### ***Screening***

Screening is the first stage of the EIA process. In this stage, the State level Expert Appraisal Committee (SEAC) examined the application of EC made by the proponent in Form 1 through online (Proposal No. SIA/TN/MIN/428897/2025 dated:11.03.2025) and decided that the project requires detailed environmental studies for the preparation of EIA report. Therefore, the proponent submitted application for Terms of Reference (ToR) on 13.03.2025.

### ***Scoping***

The proposal was placed in the 542<sup>th</sup> meeting of SEAC on 26.03.2025. Based on the presentation and documents furnished by the project proponent, SEAC decided to recommend the proposal for the grant of Terms of Reference (ToR) and the recommendation for ToR is subjected to the outcome of the Honourable NGT, Principal Bench, New Delhi (O.A No.186 of 2016 (M.A.No.350/2016) and O.A. No.200/2016 and O.A.No.580/2016 (M.A.No.1182/2016) and O.A.No.102/2017 and O.A.No.404/2016 (M.A.No. 758/2016, M.A.No.920/2016, M.A.No.1122/2016, M.A.No.12/2017 & M.A. No. 843/2017) and O.A.No.405/2016 and O.A.No.520 of 2016 (M.A.No. 981/2016, M.A.No.982/2016 & M.A.No.384/2017).

### ***Public Consultation***

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

## ***Appraisal***

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

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

The SEAC framed a comprehensive Terms of Reference (ToR) based on the information provided in the Form 1 and information collected from the proposed project site visit and issued ToR to the proponent vide ToR File No.11945 and TOR Identification No. TO25B0108TN5108832N, dated.13/05/2025 for the preparation of an EIA report.

### **1.4 POST ENVIRONMENT CLEARANCE MONITORING**

For category B projects, irrespective of its clearance by MoEF/SEIAA, the project proponent shall prominently advertise in the newspapers indicating that the project has been accorded environmental clearance and the details of MoEF website where it is displayed. After obtaining EC, the project proponent will submit a half-yearly compliance report of stipulated environmental clearance terms and conditions to MOEF & CC Regional Office & SEIAA on 1<sup>st</sup> June and 1<sup>st</sup> December of every Year.

### **1.5 TRANSFERABILITY OF ENVIRONMENTAL CLEARANCE**

A prior environmental clearance granted for a specific project or activity to an applicant may be transferred during its validity to another legal person entitled to undertake the project or activity on application by the transferor or the transferee with a written “no objection” by the transferor, to, and by the regulatory authority concerned, on the same terms and conditions under which the prior environmental clearance was initially granted, and for the same validity period (EIA Guidance Manual for Mining of Minerals, 2010).

### **1.6 IDENTIFICATION OF THE PROJECT PROPONENT**

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

**Table 1.2 Details of Project Proponent**

| Name of the Project Proponent | M/s. Jayran Mines                                                                                       |
|-------------------------------|---------------------------------------------------------------------------------------------------------|
| Address                       | D.No.HIG-301,<br>New Temple Land Hudco,<br>Rajaji Road, Hosur Taluk,<br>Krishnagiri District – 635 109. |
| Status                        | Proprietor                                                                                              |

**1.7 BRIEF DESCRIPTION OF THE PROJECT**

The proposed project deals with excavation of colour granite which is primarily used in construction projects. The method adopted for colour granite excavation is open cast semi-mechanized method involving formation of benches with 5 m height and 5 m width. The proposed project site is located in Irudukottai Village, Denkanikottai Taluk, Krishnagiri District, Tamil Nadu. Some of the important features of the proposed project have been provided in Table 1.3.

**Table 1.3 Details of the Project**

| Name of the Quarry              | M/s. Jayran Mines                                                                                                               |                      |          |
|---------------------------------|---------------------------------------------------------------------------------------------------------------------------------|----------------------|----------|
| S.F. No.                        | 1160/1 (P)                                                                                                                      |                      |          |
| Land Type                       | Govt Poramboke land                                                                                                             |                      |          |
| Extent                          | 1.09.0ha                                                                                                                        |                      |          |
| Proposed Depth for 5 years      | 6m BGL                                                                                                                          |                      |          |
| Ultimate Depth 20 years         | 21m BGL                                                                                                                         |                      |          |
| Toposheet No                    | 57-H/15                                                                                                                         |                      |          |
| Latitude between                | 12°25'38.1022"N to 12°25'43.1918"N                                                                                              |                      |          |
| Longitude between               | 77°50'27.3805"E to 77°50'22.8344"E                                                                                              |                      |          |
| Highest Elevation               | 925m ASML                                                                                                                       |                      |          |
| Topography                      | Elevated Topography                                                                                                             |                      |          |
| Geological Reserves             | Colour Granite<br>30% Recovery                                                                                                  | Granite Waste<br>70% | Top Soil |
|                                 | 61122                                                                                                                           | 142618               | 10928    |
| Mineable Reserves               | 29799                                                                                                                           | 69531                | 8162     |
| Proposed production for 5 years | 7500                                                                                                                            | 17500                | 5616     |
| Method of Mining                | It is an Eco – friendly quarry operation, no blasting is proposed. Diamond wire saw cutting method is adopted by the applicant. |                      |          |
| Machinery proposed              | Jack Hammer                                                                                                                     | 3                    |          |
|                                 | Compressor                                                                                                                      | 2                    |          |
|                                 | Tippers                                                                                                                         | 1                    |          |
|                                 | Diamond Wire Saw                                                                                                                | 1                    |          |

|                              |                   |   |
|------------------------------|-------------------|---|
|                              | Gen Set           | 1 |
| Proposed manpower deployment | 17                |   |
| Project cost                 | Rs. 2,51,30,000/- |   |
| CER cost                     | Rs 10,00,000/-    |   |
| Proposed Water Requirement   | 3.0 KLD           |   |

Source: Approved mining plan book

## 1.8 SCOPE OF THE STUDY

The main scope of the EIA study is to quantify the cumulative impact of the quarries in the cluster on the study area and formulate the effective mitigation measures for each individual lease. A detailed account of the emission sources, emissions control equipment, background air quality levels, meteorological measurements, dispersion model and all other aspects of pollution like effluent discharge, and dust generation has been provided in this report. The baseline monitoring study has been carried out during the period of **March – May 2024** for various environmental components such as land, soil, air, water, noise, ecology, etc. to assess the anticipated impacts of the cluster quarry projects on the environment and suggest suitable mitigation measures for likely adverse impacts due to the proposed project. The sampling methodologies for the various environmental parameters required for the study, frequency of sampling, method of sample analysis, etc., are given in Table 3.1 in chapter III.

## 1.9 Legislation Applicable to Mining of Mineral Sector

A few important legislations are given below:

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

## **CHAPTER II**

### **PROJECT DESCRIPTION**

#### **2.0 INTRODUCTION**

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

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

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

#### **2.1 DESCRIPTION OF THE PROJECT**

The proponent M/s.Jayran Mines, Color Granite is involved in the undertaking of establishment, construction, development, and closure of open cast mines. He, through the exploration phase, identified the proposed project site as the one that has a great potential of producing an economically viable quantity of granite. Therefore, the proponent had applied for quarry lease on 07.05.2021 to extract granite and produce dimension stones. The precise area communication letter was issued by Industries (MME.2) Department, Secretariat Chennai Letter No.898/MME.2/2021-1, dated.26.02.2021. Based on the precise area communication letter, mining plan was prepared. The mining plan thus prepared was approved by Director of Geology and Mining, Chennai (Rc.No.6946/MM4/2020, dated:19.04.2023). The overall view of the project site is shown in Figure 2.1.





**Figure 2.1 Overall View of Proposed Project Site**

## **2.2 LOCATION AND ACCESSIBILITY**

The proposed project area is Irudukottai Village, Denkanikottai Taluk, Krishnagiri District as shown in Figure 2.2. The area is located between a latitude of 12°25'38.1022"N to 12°25'43.1918"N and a longitude of 77°50'27.3805"E to 77°50'22.8344"E. Accessibility details to the proposed project site have been given in Table 2.1.



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

|                          |                                         |          |    |
|--------------------------|-----------------------------------------|----------|----|
| Nearest Road             | MDR 1251 (Denkanikottai – Bettamugalam) | 1.17 km  | E  |
|                          | NH 844 (Krishnagiri – Dharmapuri)       | 21.88 km | E  |
| Nearest Railway Station  | Royakottai                              | 28.0 km  | NE |
| Nearest Medical Facility | Denkanikottai                           | 10.0 km  | NW |
| Nearest Town             | Denkanikottai                           | 10.0 km  | NW |
| Nearest Airport          | Bangalore                               | 85.0 km  | N  |
| Nearest Port             | Chennai                                 | 280.0 km | NE |
| Nearest Village          | Giriyanaipalli                          | 1.3 km   | N  |
|                          | Hanumanthapuram                         | 1.5 km   | E  |
|                          | Gullatty                                | 5.0 km   | S  |
|                          | Iruthukottai                            | 3.5 km   | W  |

**2.3 LEASEHOLD AREA**

- ❖ 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.

**Corner Coordinates**

The extent of the proposed project site is **1.09.0ha**. The boundary corner coordinates are given in Table 2.2 and the location of 6 boundary corners are shown in Figure 2.4.

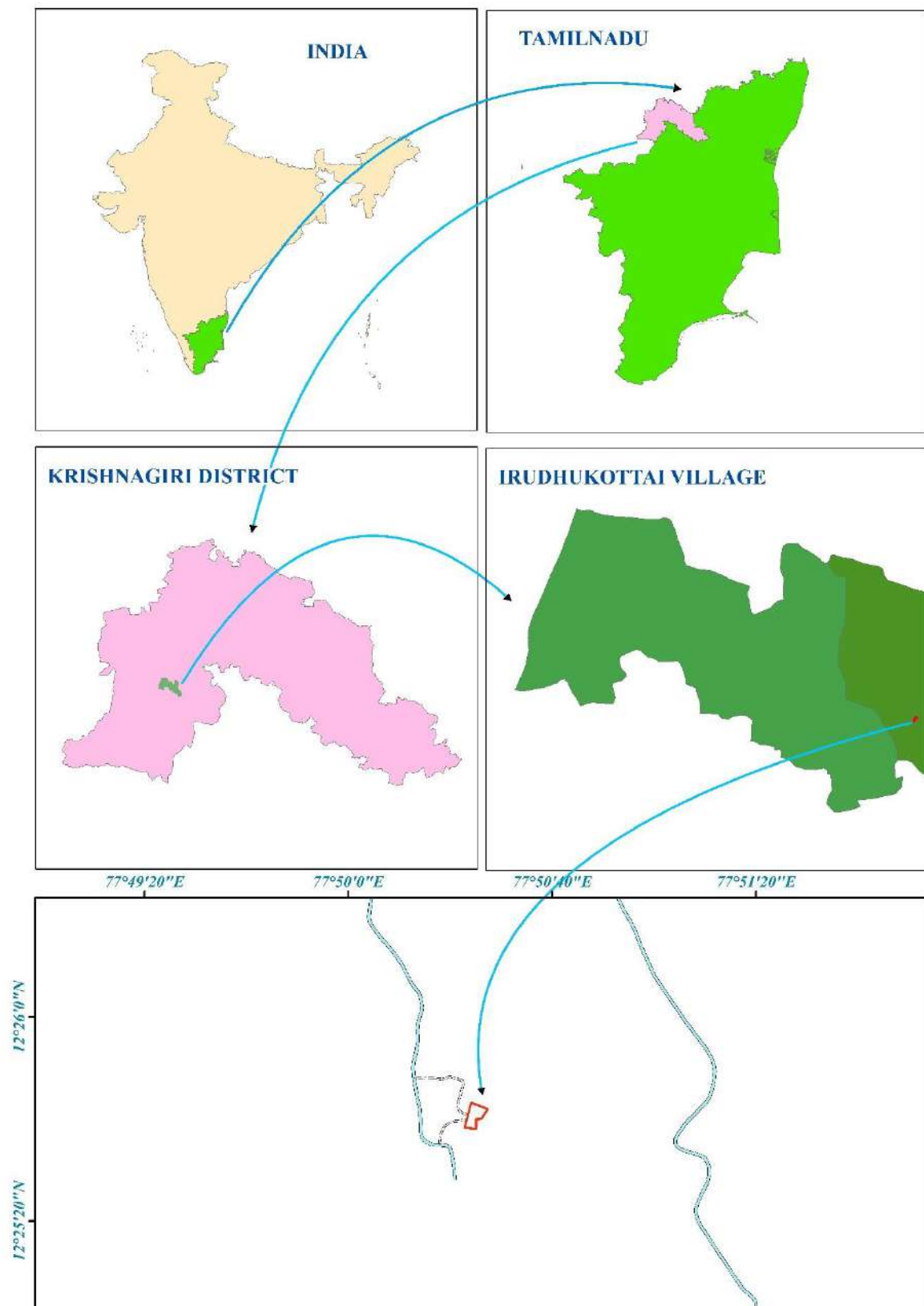
**Table 2.2 Corner Coordinates of Proposed Project**

| Pillar ID | Latitude           | Longitude          |
|-----------|--------------------|--------------------|
| 1         | 12° 25' 41.9167" N | 77° 50' 27.3805" E |
| 2         | 12° 25' 40.0070" N | 77° 50' 26.0969" E |
| 3         | 12° 25' 39.9608" N | 77° 50' 25.1119" E |
| 4         | 12° 25' 38.1022" N | 77° 50' 25.0896" E |
| 5         | 12° 25' 38.3059" N | 77° 50' 22.8344" E |
| 6         | 12° 25' 43.1918" N | 77° 50' 24.1484" E |

*Source: Approved Mining plan*

**2.4 GEOLOGY**

The lease area geologically occurs on Grey Hornblende Biotite Gneiss. Also, the lease area geomorphologically occurs Pediment Pediplain Complex



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

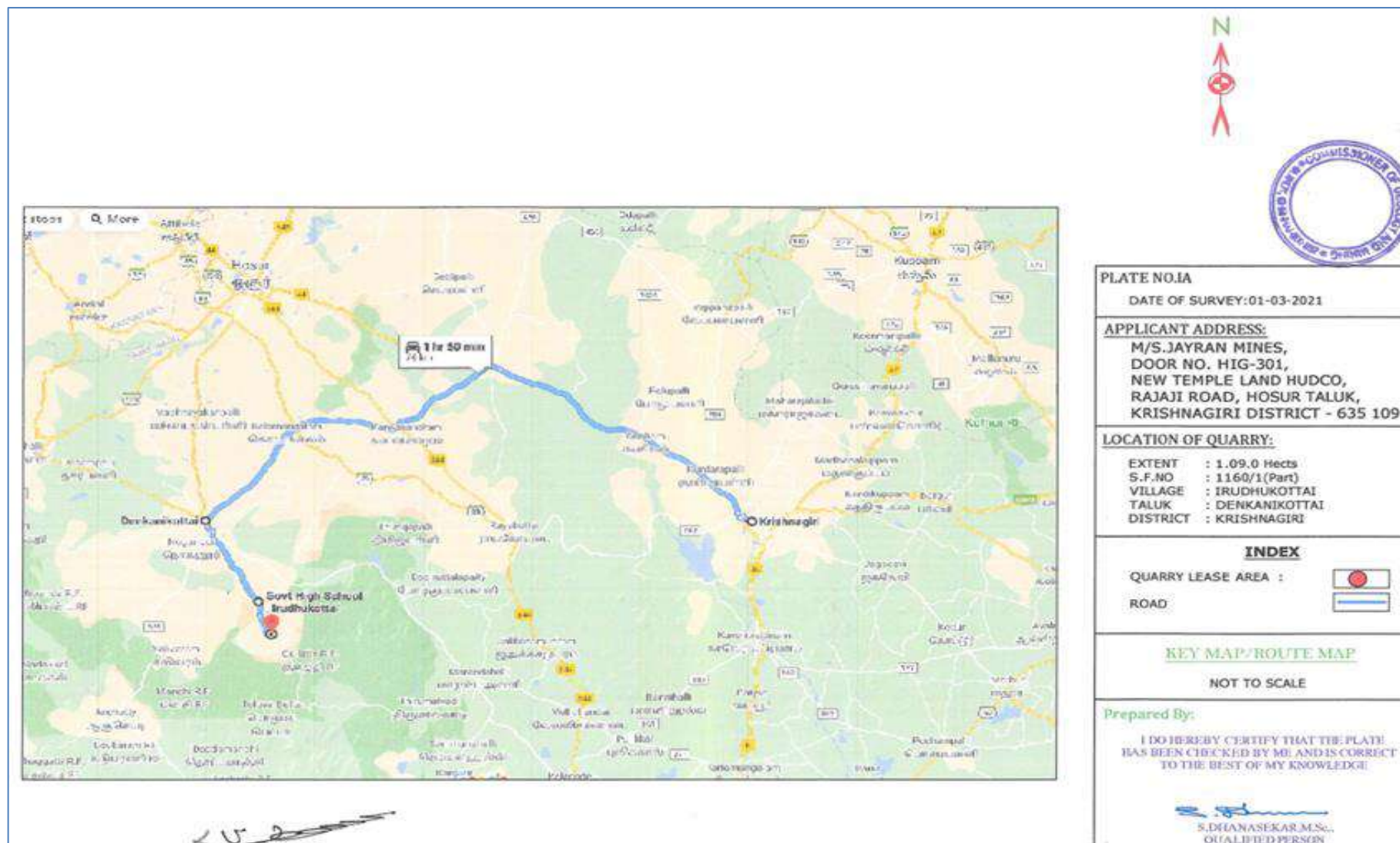


Figure 2.3 Site Connectivity of the Lease Area



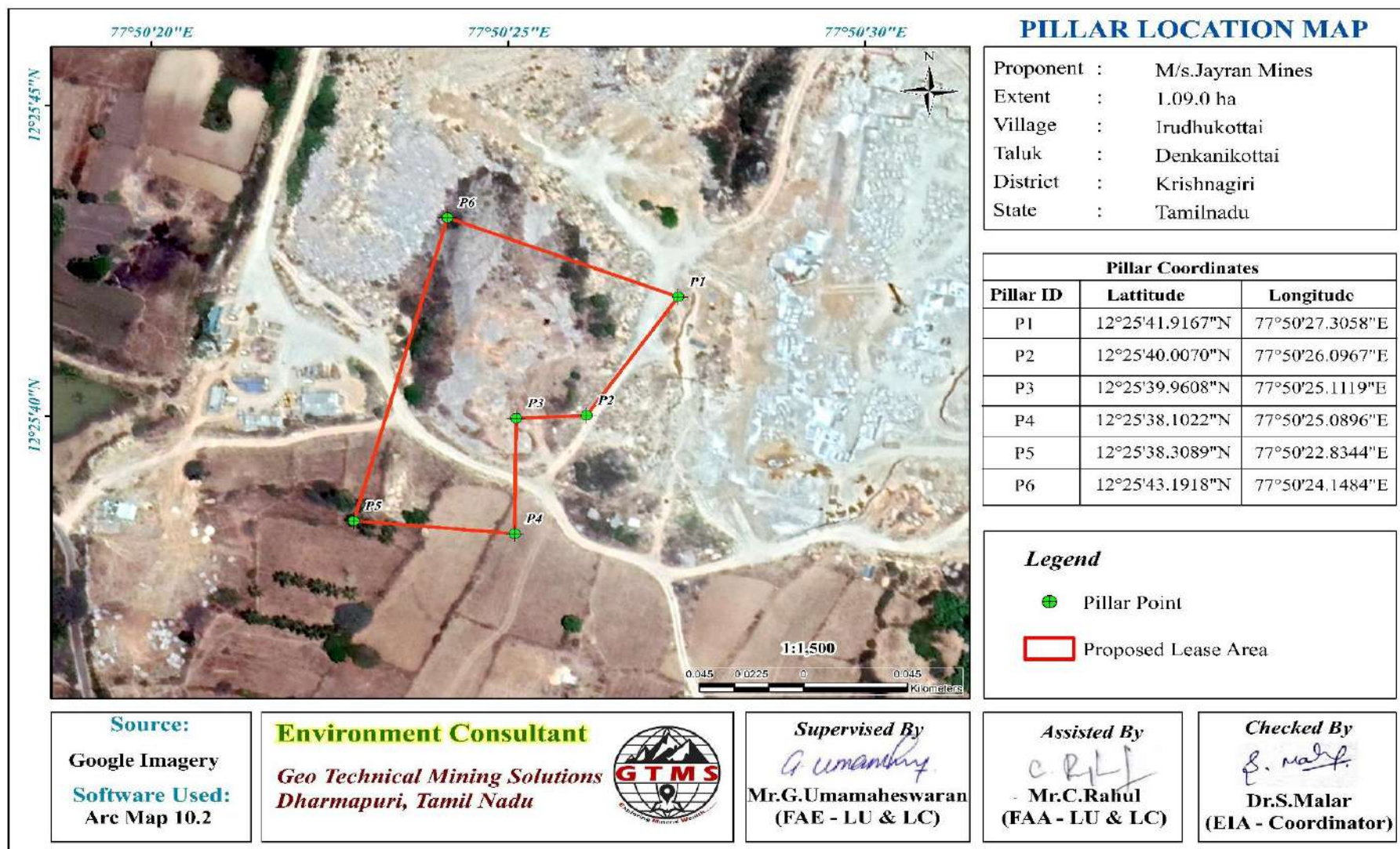


Figure 2.4 Google Earth Image Showing Lease Area with Pillar

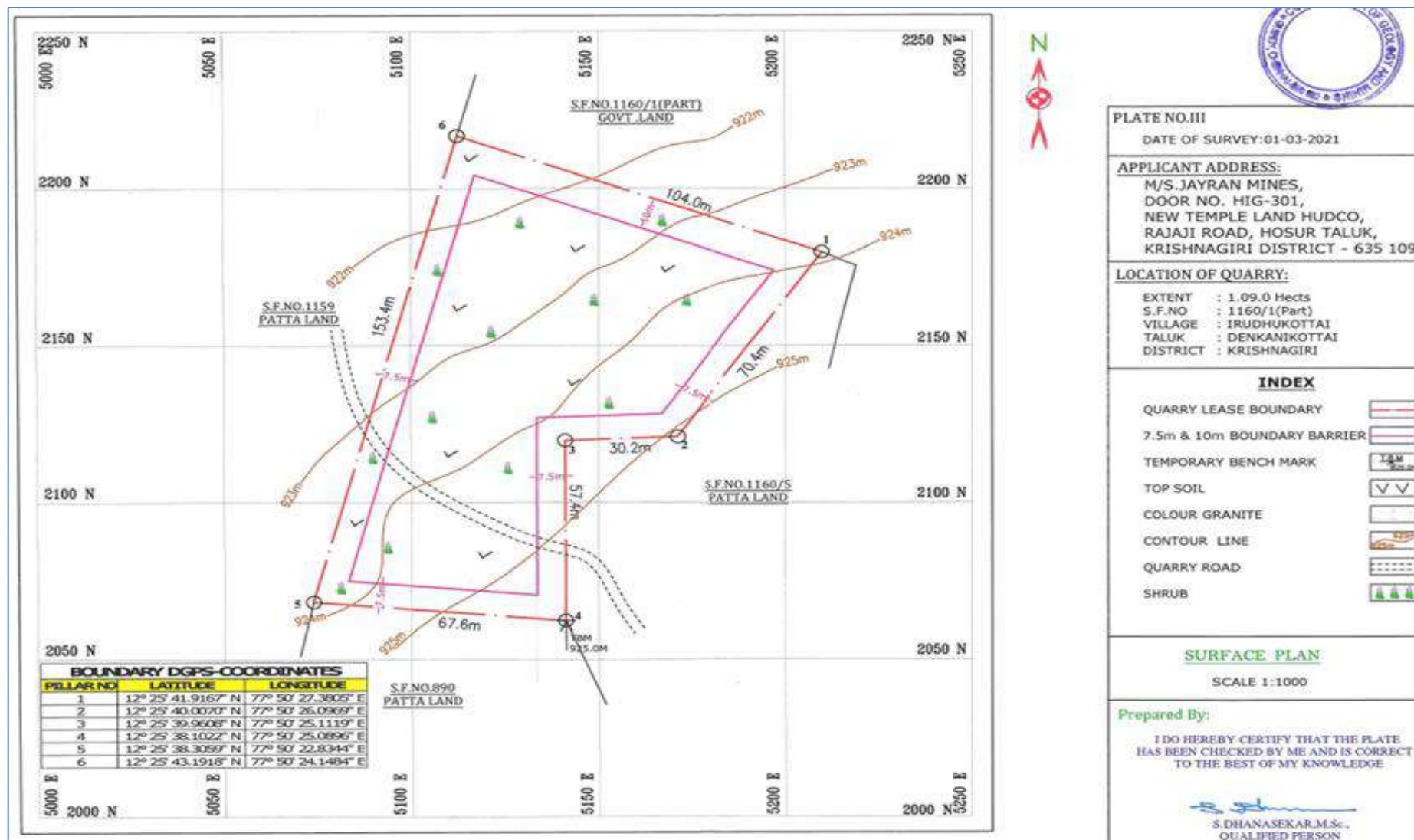


Figure 2.5 Surface Plan

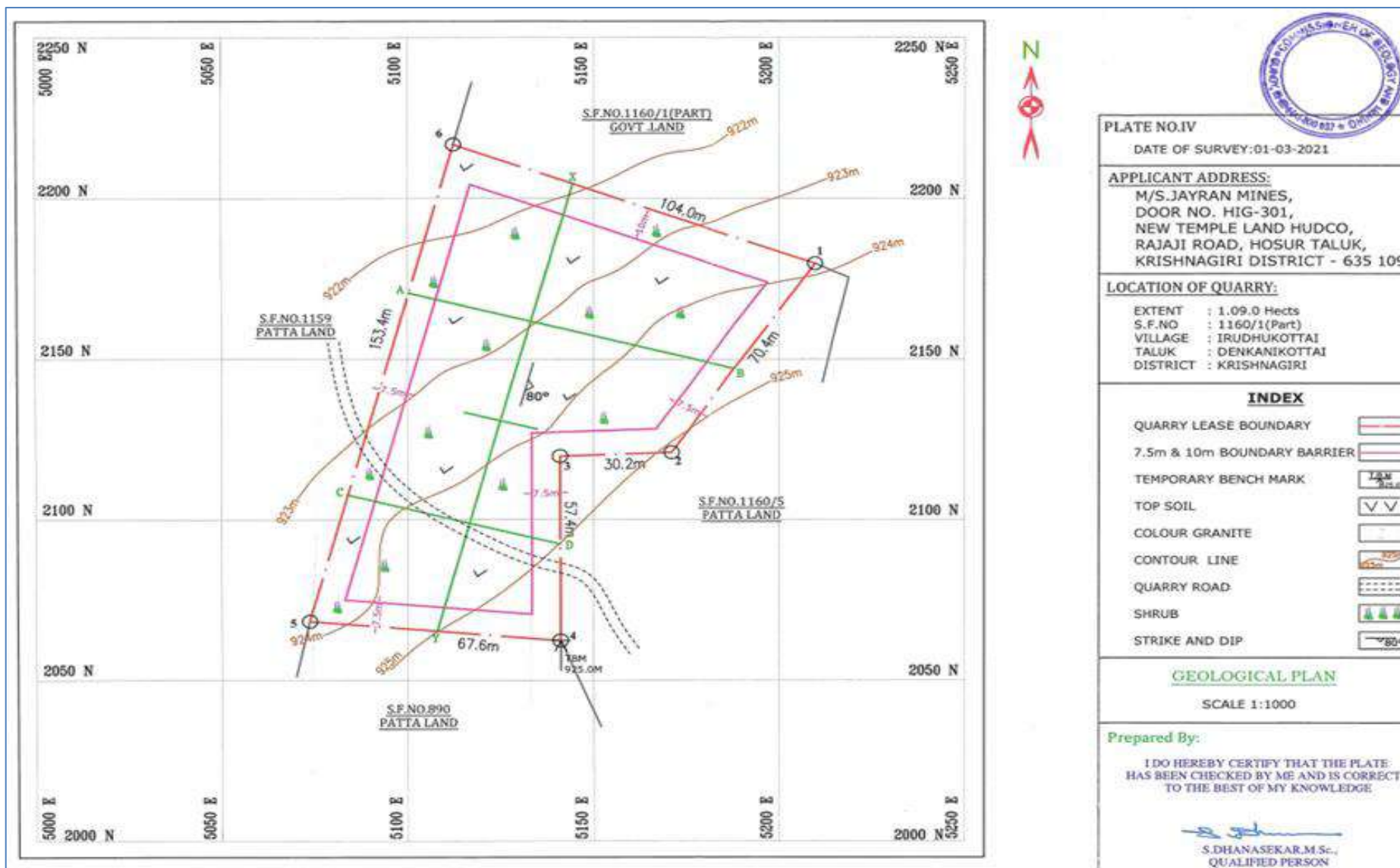


Figure 2.6 Geological Plan



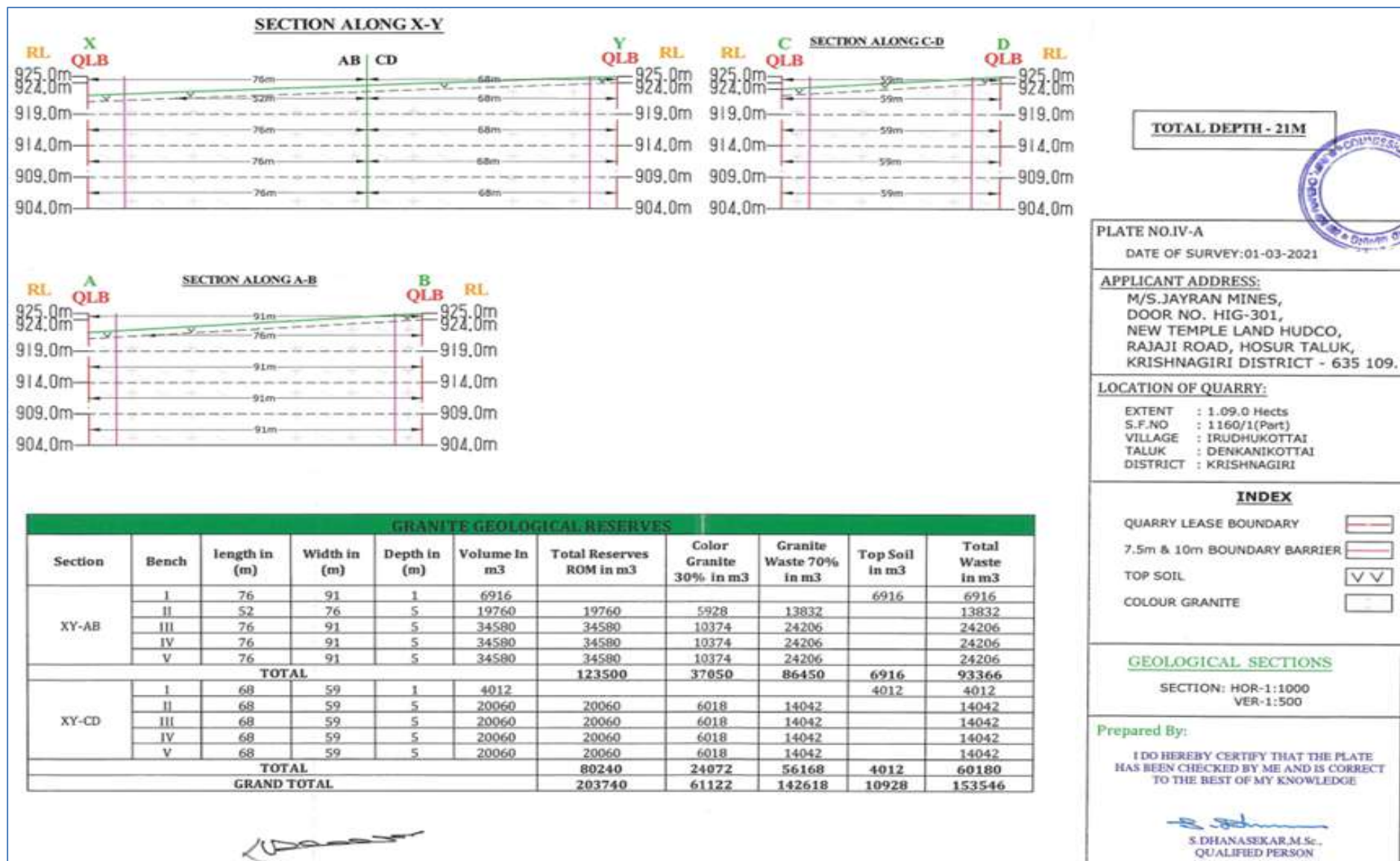


Figure 2.7 Geological Section Plan

## 2.5 RESOURCES AND RESERVES

The estimated geological resources and mineable reserves of the proposed project is provided in Table 2.3.

**Table 2.3 Estimated Resources and Reserves of the Project**

| Description           | ROM in (m <sup>3</sup> ) | color Granite @ 30% Recovery(m <sup>3</sup> ) | Granite @ 70% Waste(m <sup>3</sup> ) | Top Soil (m <sup>3</sup> ) | Total Waste (m <sup>3</sup> ) |
|-----------------------|--------------------------|-----------------------------------------------|--------------------------------------|----------------------------|-------------------------------|
| Geological Resources  | 203740                   | 61122                                         | 142618                               | 10928                      | 153546                        |
| Mineable Reserves     | 99330                    | 29799                                         | 69531                                | 8162                       | 77693                         |
| Five Years Production | 25000                    | 7500                                          | 17500                                | 5616                       | 23116                         |

### **Year -Wise Production**

On the basis of year-wise development plan and its sections, as shown in Figures 2.7 year-wise production details are given in Table 2.4.

**Table 2.4 Year wise Production Details**

| Year  | ROM in m <sup>3</sup> | Color Granite 30% Recovery(m <sup>3</sup> ) | Granite 70% Waste m <sup>3</sup> | Topsoil in m <sup>3</sup> | Total Waste in m <sup>3</sup> |
|-------|-----------------------|---------------------------------------------|----------------------------------|---------------------------|-------------------------------|
| I     | 5000                  | 1500                                        | 3500                             | 1296                      | 4796                          |
| II    | 5000                  | 1500                                        | 3500                             | 1080                      | 4580                          |
| III   | 5000                  | 1500                                        | 3500                             | 1080                      | 4580                          |
| IV    | 5000                  | 1500                                        | 3500                             | 1080                      | 4580                          |
| V     | 5000                  | 1500                                        | 3500                             | 1080                      | 4580                          |
| Total | <b>25000</b>          | <b>7500</b>                                 | <b>17500</b>                     | <b>5616</b>               | <b>23116</b>                  |

*Source: Approved Mining plans*

## 2.6 MINING METHOD

The mining operation is opencast semi-mechanized method adopted on single shift basis only. Under the regulation 106 of the Metalliferous Mines Regulations, 1961 in all open cost workings in hard rock, the benches and sides should be properly benched and sloped. The bench height should not exceed 5m and the bench width should not less than the bench height. The slope of the benches should not exceed 45°C from horizontal. The colour granite is proposed to quarry at 5m bench height & width conventional open cast method.

Drill hole is of diameter 32mm, depth and inclination of drill hole is generally drilled vertically in an alignment, however in primary cutting in the absence of sheet joints to bottom level, horizontal holes also are drilled. The spacing will be about 0.1m to 0.3m from hole to hole and burden goes up to 1.6m for the splitting of the rock. The intrusive body will be tackled with latest technology by deploying diamond wire saw cutting for obtaining the good recovery factor of sizeable blocks.



**Blasting pattern:**

It is an Eco-friendly quarry operation, no blasting is proposed, Diamond wire saw cutting method is adopted by the applicant. Nowadays, the splitting within the sheet rock is affected by diamond wire-sawing, which largely reduces the use of explosives in granite mining. Besides, chemical powder called as “Rock breaking Powder”  $[Ca(OH)_2]$  are also used for splitting. Many adverse effects of blasting are avoided and hence diamond wire cutting will substantially increase the recovery. Since primary cutting comprising splitting from the sheet rock is affected by diamond wire-sawing there will not be any drilling or blasting involved. Hence, there will not any adverse effects and vibration due to this type of mining operation

**Magnitude of Operation**

Based on the results of estimated production for the 5 years as shown in Table 2.5, details about the size of operation have been provided.

**Table 2.5 Operational Details for Proposed Project**

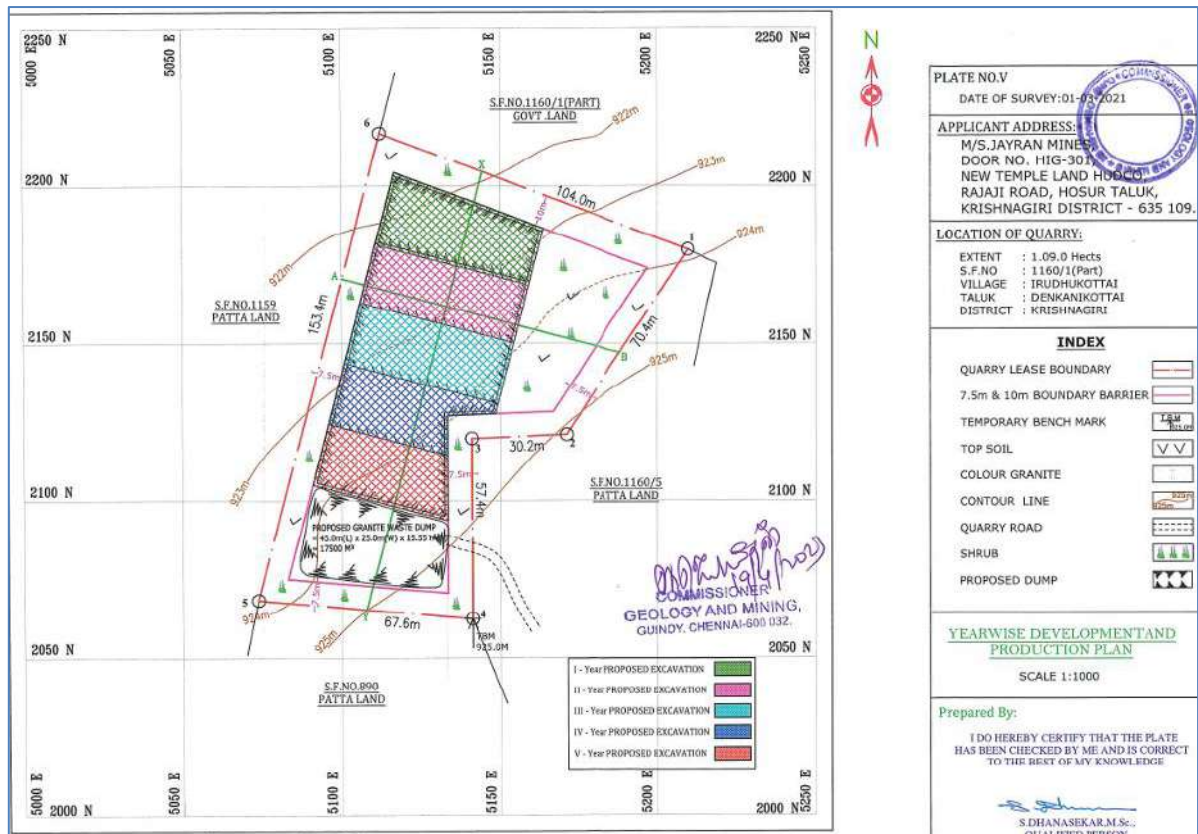
|                                                       | <b>Color Granite Recovery<br/>@ 30% in m<sup>3</sup></b> | <b>color Granite<br/>Waste<br/>@ 70% in m<sup>3</sup></b> |
|-------------------------------------------------------|----------------------------------------------------------|-----------------------------------------------------------|
| Quantity of Material to be Quarried out in five years | 7500                                                     | 17500                                                     |
| Number of working days/Annum                          | 270                                                      | 270                                                       |
| Production of /Day (m <sup>3</sup> )                  | 6                                                        | 13                                                        |
| No. of Lorry Loads                                    | 1                                                        | 2                                                         |

**Extent of Mechanization**

To achieve the above-mentioned production, various machineries are proposed for the quarrying operation, as given in Table 2.6.

**Table 2.6 Machinery Details**

| <b>Drilling Equipment</b>                |                    |                          |                       |             |                     |
|------------------------------------------|--------------------|--------------------------|-----------------------|-------------|---------------------|
| <b>Type</b>                              | <b>No. of Unit</b> | <b>Dia. of Hole (mm)</b> | <b>Size capacity</b>  | <b>Make</b> | <b>Motive Power</b> |
| Compressor                               | 2                  | -                        | 400 psi               | Atlas Copco | Diesel              |
| Jack Hammer                              | 3                  | 32                       | 1.2m – 6m             | Atlas Copco | Compressed Air      |
| Diamond Wire Saw                         | 1                  | -                        | 30m <sup>3</sup> /day | Optima      | Diesel Generator    |
| Gen Set                                  | 1                  | -                        | Powerica              | -           | CP 125 DSP (H.P)    |
| <b>Loading Equipment</b>                 |                    |                          |                       |             |                     |
| Excavator                                | 1                  | --                       | 350                   | Kobelco     | Diesel Drive        |
| <b>Haulage &amp; Transport Equipment</b> |                    |                          |                       |             |                     |
| Tipper                                   | 1                  | -                        | 10tonnes              | tata        | Diesel              |



**Figure 2.8 Year-Wise Development Production Plan & Sections**

### ***Stacking of Granite Rejects and Disposal of Waste***

The Thickness of 1m topsoil will measure about 5616m<sup>3</sup> of the quarry which will be utilized for construction of bunds, road and afforestation purpose. First five years colour granite waste forms nearly 70% of ROM and the quantity of waste in the five years will be around 23116m<sup>3</sup>. The Granite waste material will be proposed to dump in the Southern side of the lease area. The Proposed granite waste (70%) will be dumped in the Southern side of the lease applied area with dimensions 45.0m (L) X 25.0m (W) X 15.55m (H). avg Which will also accommodate the waste generated during the first five years. The topsoil is 5616m<sup>3</sup> will be removed and stacked for earth bund in the lease hold area to prevent inherent entry of cattle's and human as per rules 106, Metalliferous Mines Regulations, 1961. colour granite may be un sold it will be kept within the lease boundary.

### ***Progressive Quarry closure plan***

The progressive quarry closure plan of the proposed project showing present, and future land use statistics is provided in Table 2.7. According to data shown in the table, at the end of the quarry life, about 0.46.0ha of land would have been utilized for quarrying, 0.11.0ha of land for waste dump, 0.01.00 ha for infrastructures, 0.01.00ha for roads, 0.34.00ha for green belt development for first five years plan period.

**Table 2.7 Land use data at present, during scheme of mining and at the end of mine life**

| <b>Description</b> | <b>Present Land Use Area (ha)</b> | <b>Area to be Required at the present mining plan period (ha)</b> | <b>Land Use Area at the end of mine life (ha)</b> |
|--------------------|-----------------------------------|-------------------------------------------------------------------|---------------------------------------------------|
| Area under quarry  | Nil                               | 0.46.0                                                            | 0.73.0                                            |
| Dumps              | Nil                               | 0.11.0                                                            | Backfilling                                       |
| Stockyard          | Nil                               | Nil                                                               | Nil                                               |
| Infrastructure     | Nil                               | 0.01.0                                                            | 0.01.0                                            |
| Roads              | Nil                               | 0.01.0                                                            | 0.01.0                                            |
| Green Belt         | Nil                               | 0.34.0                                                            | 0.34.0                                            |
| Unutilized Area    | 1.09.0                            | Nil                                                               | Nil                                               |
| <b>Total</b>       | <b>1.09.0</b>                     | <b>0.93.0</b>                                                     | <b>1.09.0</b>                                     |

### ***Conceptual Mining Plan***

On the basis of conceptual plan and its sections, as shown in Figures 2.9, the ultimate pit dimension of the quarry is 126m in length, 60m in width, and 21m in depth.

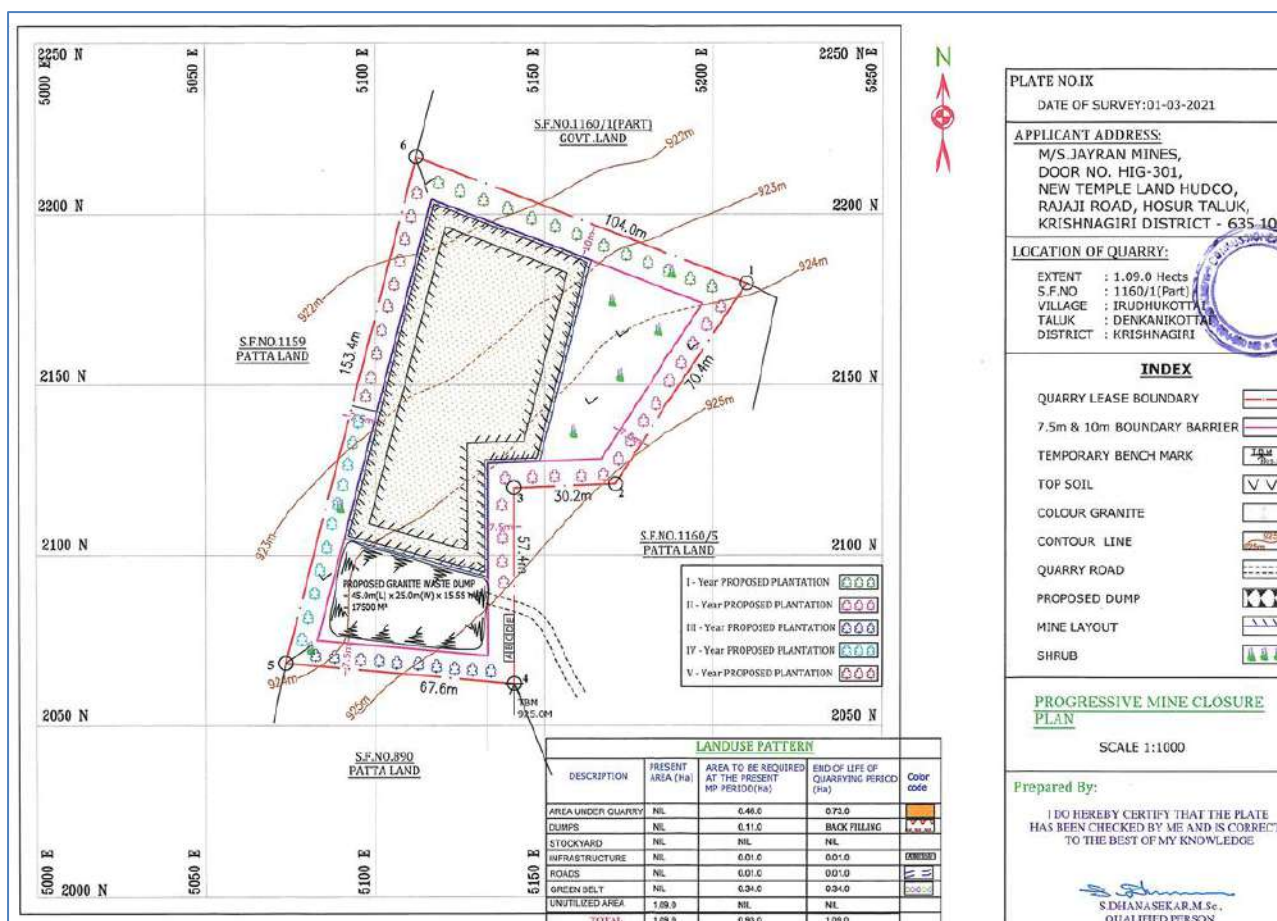
## Mine closure

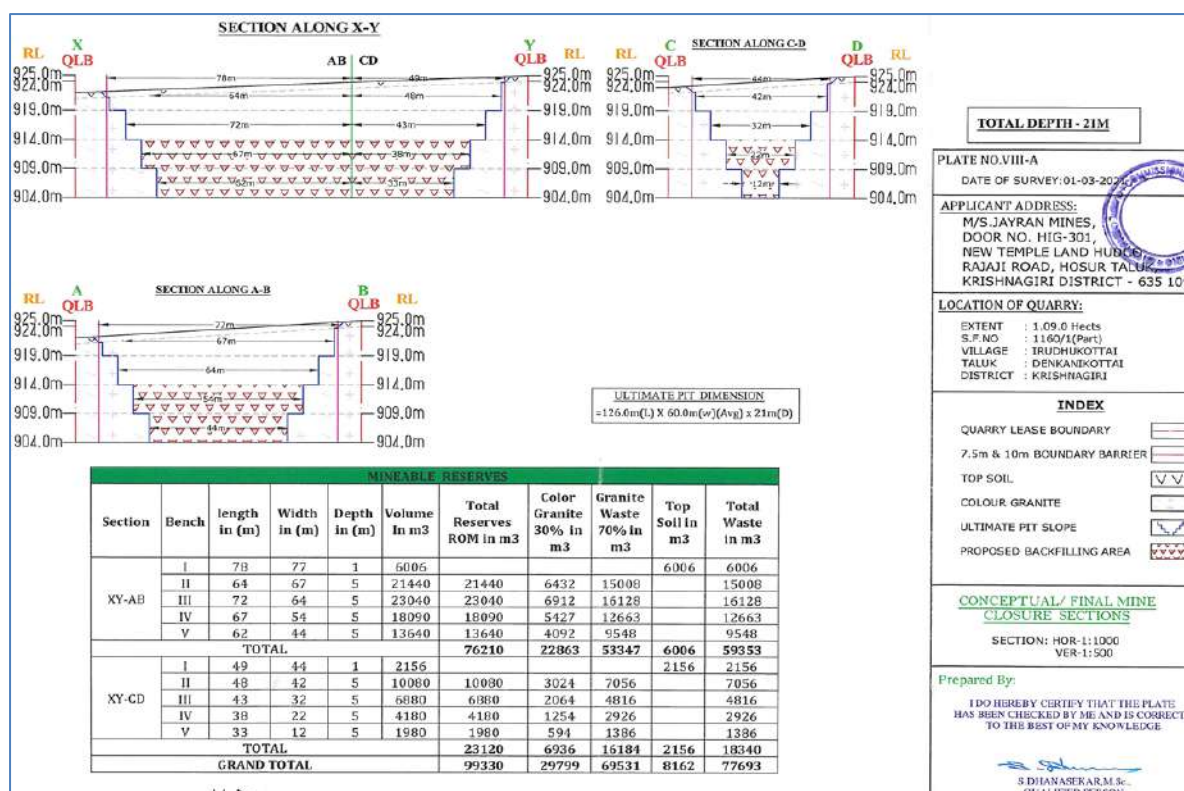
As the proposed project has the enormous potential for continuous operations even after the expiry of lease period, mine closure plan is not proposed for now. Based on the progressive mine closure plan, as shown in Figures 2.8 for the scheme period, the progressive mine closure cost is given in Table 2.8.

**Table 2.8 Progressive Mine Closure Budget**

| Activity                          | Capital Cost    |
|-----------------------------------|-----------------|
| 218 plants inside the lease area  | 43,600          |
| 327 plants outside the lease area | 98,100          |
| Wire Fencing                      | 2,18,000        |
| Garland Drain                     | 10,900          |
| <b>Total</b>                      | <b>3,70,600</b> |

Source: Environment Management Plan





**Figure 2.9 Progressive Quarry Closure Plan & Sections**

### Project Requirement

The project requires water, power, fuel, and other infrastructures as discussed below:

#### i) Water Requirement

Detail of water requirement in 3.0KLD is given in Table 2.9.

**Table 2.9 Water Requirement for the Project**

| Purpose             | Quantity Required (KLD) | Source                                                                                                                                                             |
|---------------------|-------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Domestic & Drinking | 1.0                     | Water for domestic, dust suppression, and green belt development purposes will be sourced from existing bore wells and drinking water from approved water vendors. |
| Dust Suppression    | 1.0                     |                                                                                                                                                                    |
| Green Belt          | 1.0                     |                                                                                                                                                                    |
| <b>Total</b>        | <b>3.0</b>              |                                                                                                                                                                    |

Source: Feasibility Report

#### ii) Energy Requirement

The electricity from high tension power supply is utilized for diamond wire saw cutting machine, disc double blade cutting machine, air compressor, derrick crane and pumps for de-watering and is also used for mines office and lighting purpose.

In addition to electricity, around 96,540litres of HSD are used for total diesel consumption for Excavator, Compressor and Tipper. It will be brought to the site from nearby diesel pumps. Details on the estimation of fuel requirements are provided in Table 2.10.

**Table 2.10 Fuel Requirement Details**

| <b>Fuel Requirement for Excavator</b>                               |                                                                |                                                         |                                           |                                     |
|---------------------------------------------------------------------|----------------------------------------------------------------|---------------------------------------------------------|-------------------------------------------|-------------------------------------|
| <b>Details</b>                                                      | <b>color Granite<br/>Recovery @30%<br/>(7500m<sup>3</sup>)</b> | <b>Granite Waste<br/>@70%<br/>(17500 m<sup>3</sup>)</b> | <b>Top<br/>Soil<br/>5616m<sup>3</sup></b> | <b>Total<br/>Diesel<br/>(litre)</b> |
| Average Rate of Fuel Consumption (l/hr)                             | 16                                                             | 16                                                      | 10                                        | ---                                 |
| Working Capacity (m <sup>3</sup> /hr)                               | 20                                                             | 20                                                      | 60                                        | ---                                 |
| Time Required (hours)                                               | 375                                                            | 875                                                     | 94                                        | ---                                 |
| Total Diesel Consumption for 5 years (litre)                        | 6,000                                                          | 14,000                                                  | 940                                       | <b>20,940</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                                              | 1                                                              | 2                                                       | --                                        | ---                                 |
| Number of Trips / 5 years                                           | 1,350                                                          | 2,700                                                   | --                                        | ---                                 |
| Total Diesel Consumption for 5 years (litre)                        | 21,600                                                         | 54,000                                                  | --                                        | <b>75,600</b>                       |
| <b>Total Diesel Consumption by Excavator, Compressor and Tipper</b> |                                                                |                                                         |                                           | <b>96,540</b>                       |



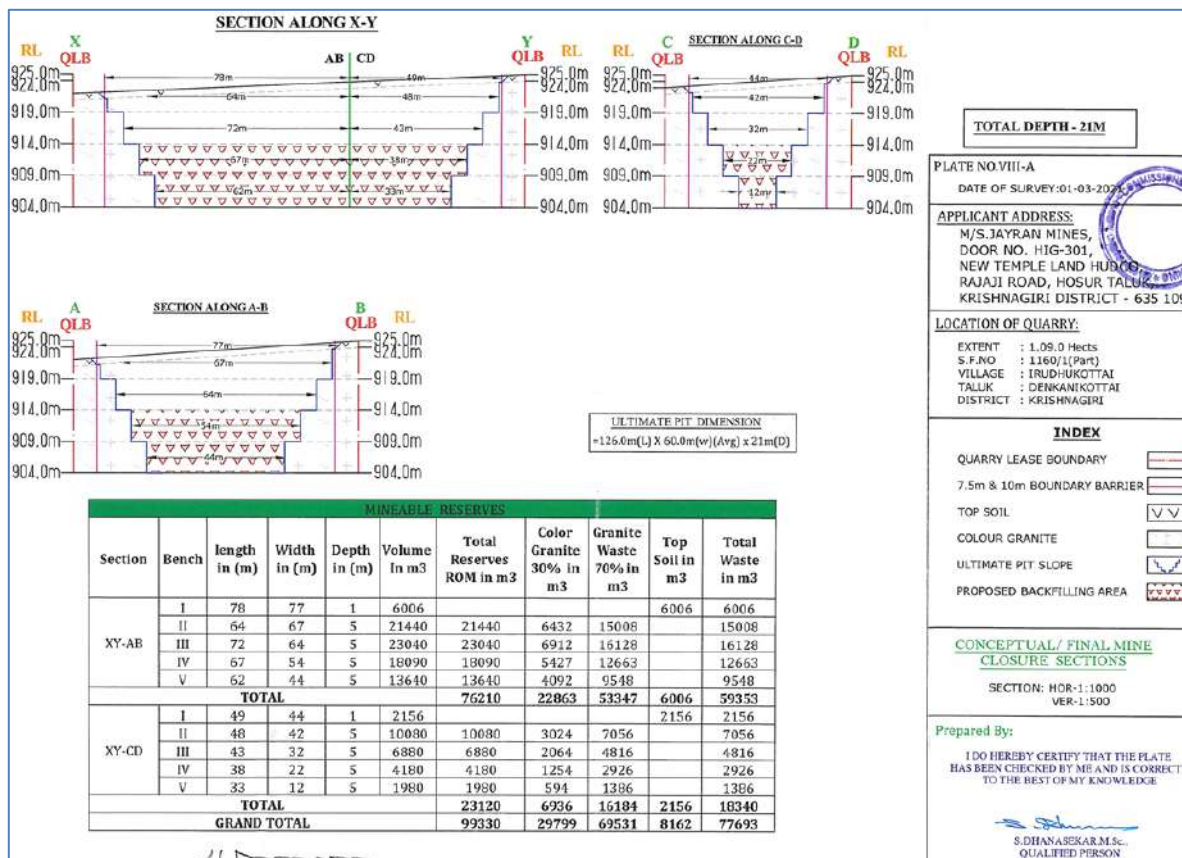
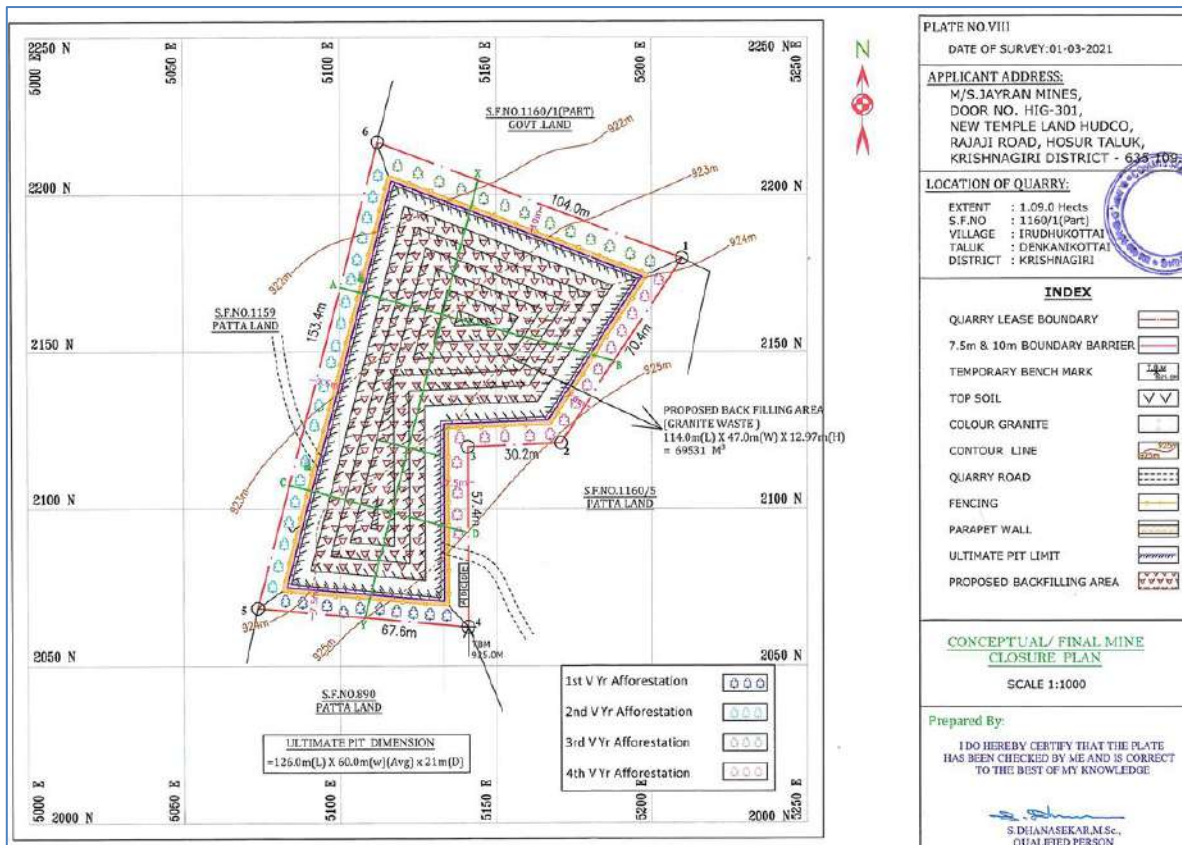


Figure 2.10 Conceptual Plan & Sections

### iii) Employment 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 2.11.

**Table 2.11 Employment Potential for the proposed project**

| S. No.       | Category       | Role                                 | Nos.      |
|--------------|----------------|--------------------------------------|-----------|
| 1            | Highly Skilled | Mines Manager                        | 1         |
|              |                | Record Clerk                         | 1         |
|              |                | Supervisor cum Blaster               | 1         |
| 2            | Skilled        | Compressor and wagon drill operators | 2         |
|              |                | Drillers / Workers                   | 4         |
|              |                | Excavator / Rock Breaker Operators   | 2         |
|              |                | Vehicle Driver                       | 2         |
| 3            | Semi - Skilled | Watchmen                             | 1         |
| 4            | Un-Skilled     | Cleaners                             | 3         |
| <b>Total</b> |                |                                      | <b>17</b> |

*Source: Approved Mining Plan*

### iv) Infrastructure Requirement

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

### v) Capital Requirement

The summary of capital required for the project is provided in Table 2.12.

**Table 2.12 Capital Requirement Details**

| S. No.                    | Description      | Cost (Rs.)           |
|---------------------------|------------------|----------------------|
| 1                         | Fixed Asset Cost | 1,40,20,000/-        |
| 2                         | Machinery Cost   | 1,08,00,000/-        |
| 3                         | Expenditure Cost | 3,10,000/-           |
| <b>Total Project Cost</b> |                  | <b>2,51,30,000/-</b> |

*Source: Mining plan 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 Table 2.13.

**Table 2.13 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    |                           |                 |                 |                 |                 |                               |
| 3                                                                                        | Consent to operate      |                           |                 |                 |                 |                 | Project establishment period. |
| 4                                                                                        |                         |                           |                 |                 |                 |                 | Production starting period.   |
| Time line may vary; subjected to rules and regulations /& other unforeseen circumstances |                         |                           |                 |                 |                 |                 |                               |

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

## CHAPTER III

### DESCRIPTION OF THE ENVIRONMENT

#### 3.0 GENERAL

This chapter presents a regional background to the baseline data at the very onset, which will help in better appreciation of micro-level field data, generated on several environmental and ecological attributes of the study area. The baseline status of the project environment is described section wise for better understanding of the broad-spectrum conditions. The baseline environment quality represents the background environmental scenario of various environmental components such as land, water, air, noise, biological and socio-economic status of the study area. Field monitoring studies to evaluate the base line status of the project site were carried out covering **March through May, 2024** with CPCB guidelines. Environmental baseline data were collected by an NABL accredited and MoEF notified **Greenlink Analytical and Research Laboratory (India) Private Ltd** for the environmental attributes including soil, water, air, and noise and by FAEs for ecology and biodiversity, traffic, and socio-economy.

#### **Study Area**

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

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

| Attribute               | Parameters                                            | Frequency of Monitoring      | No. of Locations                 | Protocol                                                                            |
|-------------------------|-------------------------------------------------------|------------------------------|----------------------------------|-------------------------------------------------------------------------------------|
| Land Use/<br>Land Cover | Land-use Pattern within 5 km radius of the study area | Once during the study period | Study Area                       | Satellite Imagery & Primary Survey                                                  |
| *Soil                   | Physico-Chemical characteristics                      | Once during the study period | 6<br>(1 core & 5 in buffer zone) | IS 2720<br>Agriculture Handbook - Indian Council of Agriculture Research, New Delhi |

|                        |                                                                                                     |                                                          |                                         |                                                                                     |
|------------------------|-----------------------------------------------------------------------------------------------------|----------------------------------------------------------|-----------------------------------------|-------------------------------------------------------------------------------------|
| *Water Quality         | Physical, Chemical and Bacteriological Parameters                                                   | Once during the study period                             | 6<br>(2 surface water & 4 ground water) | IS 10500 & CPCB Standards                                                           |
| Meteorology            | Wind speed<br>Wind direction<br>Temperature<br>Cloud cover<br>Dry bulb temperature<br>Rainfall      | 1 hourly continuous mechanical/automatic weather station | 1                                       | Site specific primary data & secondary data from IMD Station                        |
| *Ambient Air Quality   | PM <sub>10</sub> , PM <sub>2.5</sub><br>SO <sub>2</sub> , NO <sub>x</sub> , and Fugitive dust       | 24 hours, twice a week                                   | 6<br>(1 core & 5 buffer)                | IS 5182 Part 1-23 National Ambient Air Quality Standards, CPCB                      |
| *Noise Levels          | Ambient noise                                                                                       | Hourly observation for 24 hours per location             | 6<br>(1 core & 5 buffer zone)           | IS 9989 As per CPCB Guidelines                                                      |
| Ecology                | Existing flora and fauna                                                                            | Through field visit during the study period              | Study area                              | Primary Survey by Quadrant & Transect Study<br>Secondary Data – Forest Working Plan |
| Socio Economic Aspects | Socio-economic characteristics, population statistics and existing infrastructure in the study area | Site visit & Census Handbook, 2011                       | Study area                              | Primary Survey, census handbook & need based assessments.                           |

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

### **3.1 LAND ENVIRONMENT**

#### **3.1.1 Geology and Geomorphology**

Study area is mainly composed of biotite hornblende genesis and grey hornblende biotite genesis, as shown in Figure 3.1. Among the geomorphic units, shallow weathered/buried pediplain and pediment dominate the study area, as shown in Figure 3.2. The lease area occurs in shallow weathered/buried pediplain terrain.

### 3.1.2 Land Use/ Land Cover

Land Use and Land Cover (LU/LC) map, as shown in Figure 3.3 was prepared using Sentinel II image for the study area of 5 km radius. Totally, 7 LULCs were mapped. The areal extent of each LULC is provided in Table 3.2. Of the total area, mining area covers only 73.04 ha of which lease area of 1.09.0 ha contributes only about 0.012%. This small percentage of mining activities shall not have any significant impact on the land environment.

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

| S. No        | Classification         | Extent (ha)    | Area (%)     |
|--------------|------------------------|----------------|--------------|
| 1            | Water                  | 10.91          | 0.13         |
| 2            | Trees                  | 1286.92        | 15.09        |
| 3            | Crops                  | 3222.86        | 37.78        |
| 4            | Built Area             | 324.53         | 3.80         |
| 5            | Mining/Industrial area | 73.04          | 0.86         |
| 6            | Bare Ground            | 2.47           | 0.03         |
| 7            | Rangeland              | 3609.99        | 42.32        |
| <b>Total</b> |                        | <b>8530.72</b> | <b>100.0</b> |

*Source: Sentinel II Satellite Imagery*

### 3.1.3 Topography

The applied lease area exhibits an elevated topography, which is elevation difference of 15 m. The highest elevation observed in lease area is 474m AMSL, whereas the lowest elevation is 459m AMSL.

### 3.1.4 Drainage Pattern

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

### 3.1.5 Seismic Sensitivity

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

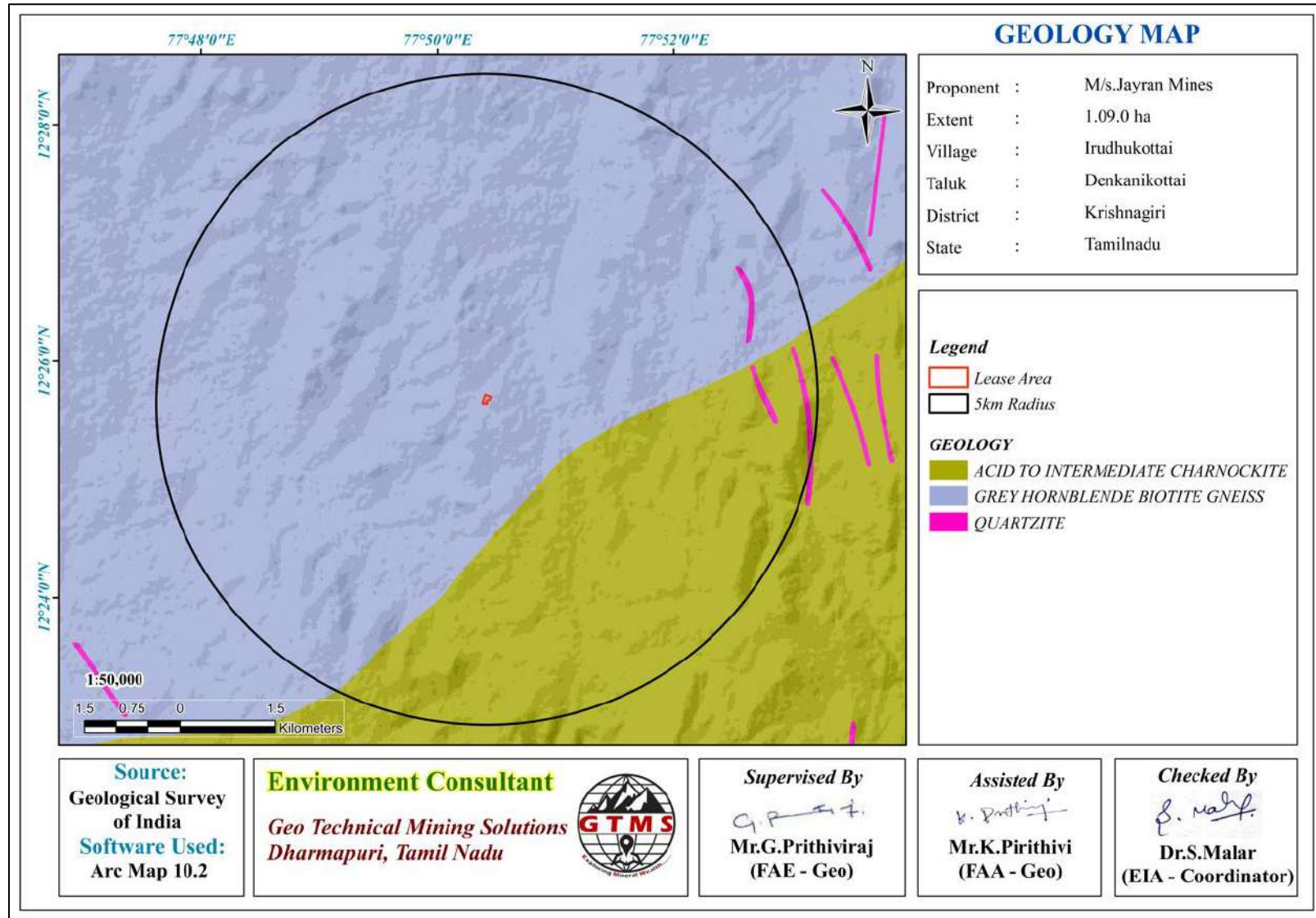


Figure 3.1 Geology Map of 5 km Radius from the Proposed Project Site

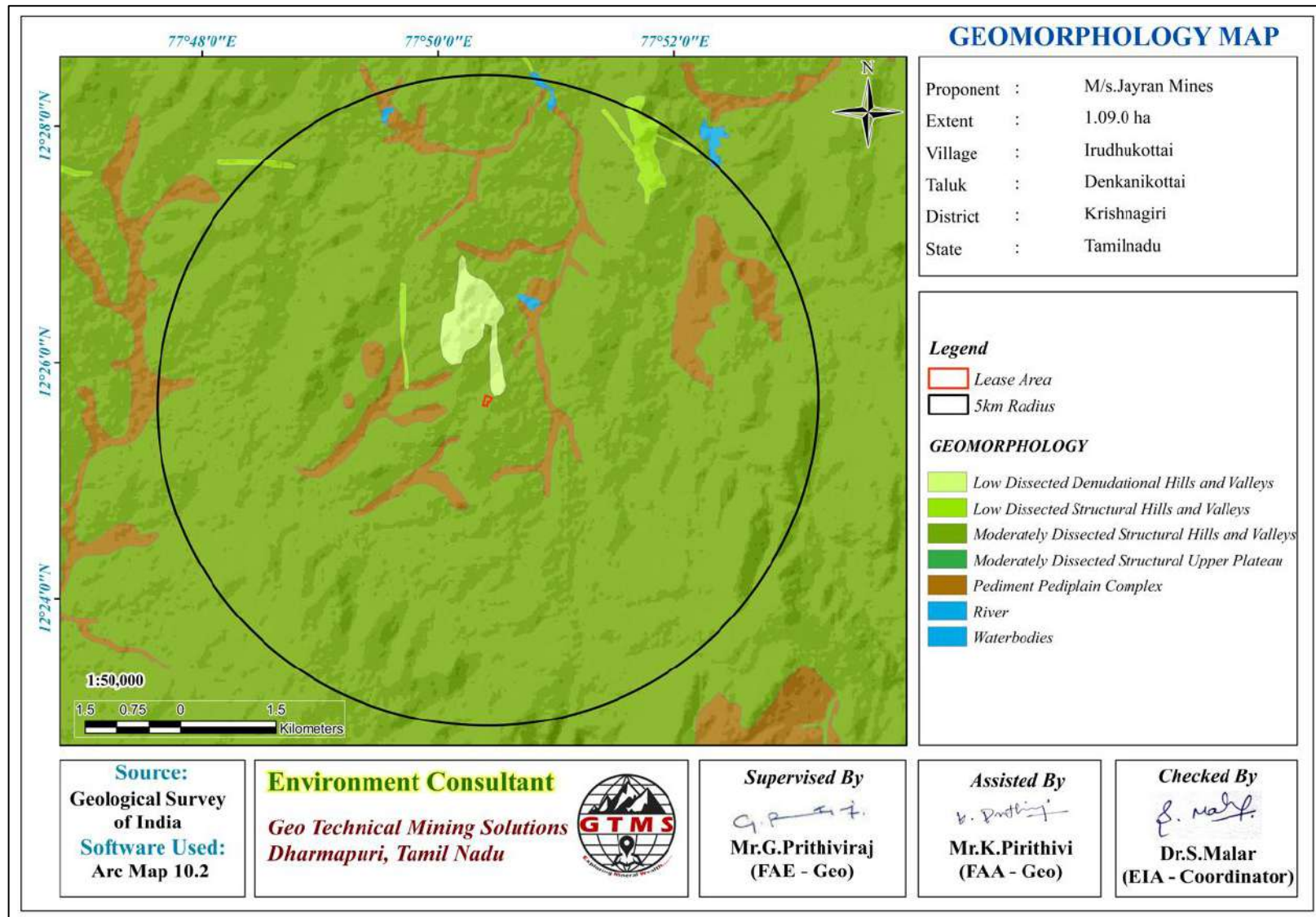
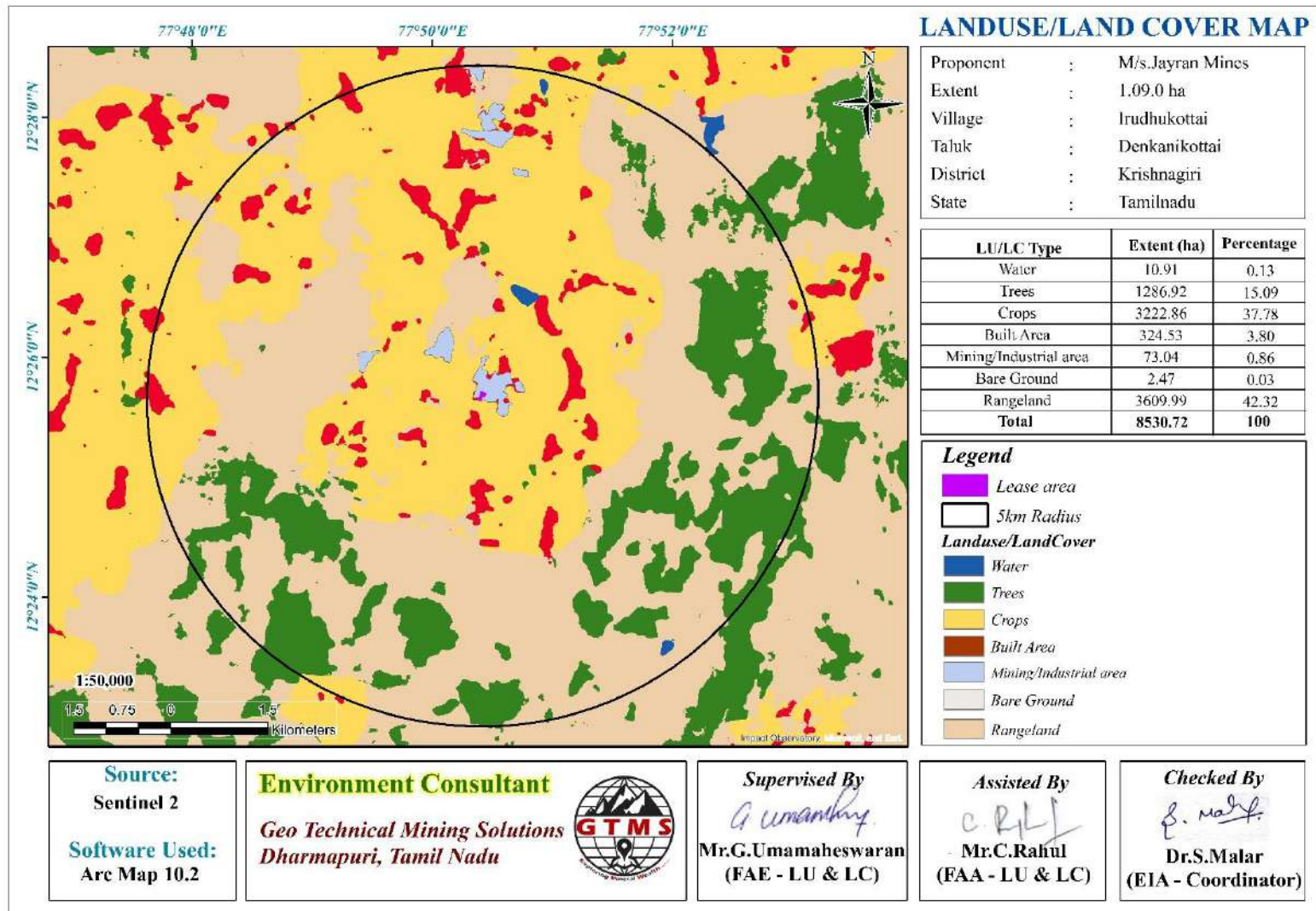
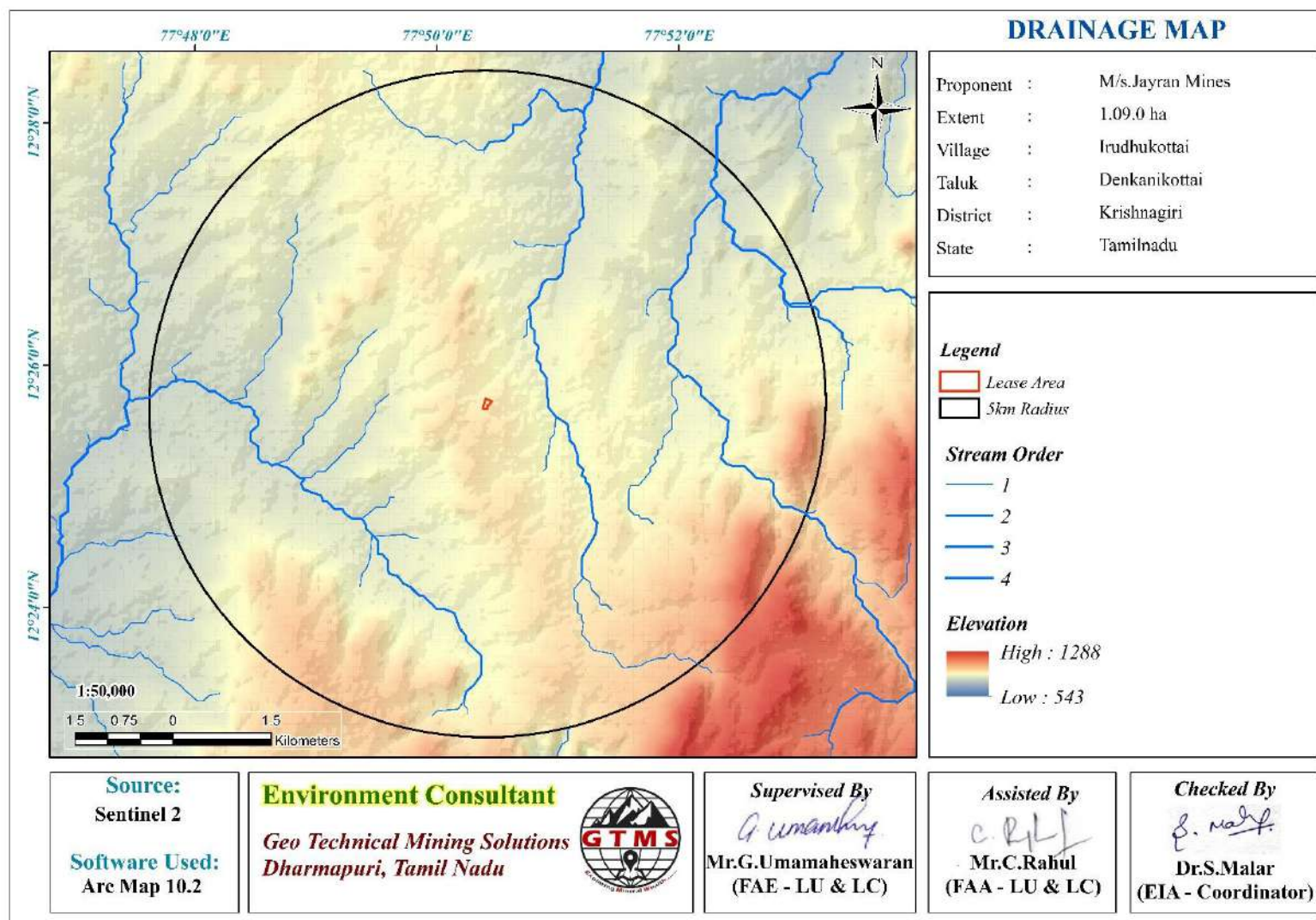


Figure 3.2 Geomorphology Map of 5 km Radius from the Proposed Project Site





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



**Figure 3.4 Drainage Map of 5 km Radius from the Proposed Project Site Showing Dendritic Pattern**



### 3.2 SOIL ENVIRONMENT

Soil is one of the important components of the land environment. Composite soil samples were collected from the study area and analysed for different parameters to determine the baseline soil characteristics of the study area.

#### 3.2.1 Methodology

Six 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 as per the standard methods prescribed in “Soil Chemical Analysis (M.L. Jackson, 1967) & Department of Agriculture, Cooperation & Farmers Welfare, Ministry of Agriculture & Farmers Welfare, Government of India”. The physical and chemical characteristic results of soil samples are provided in Table 3.4.

**Table 3.3 Soil Sampling Locations**

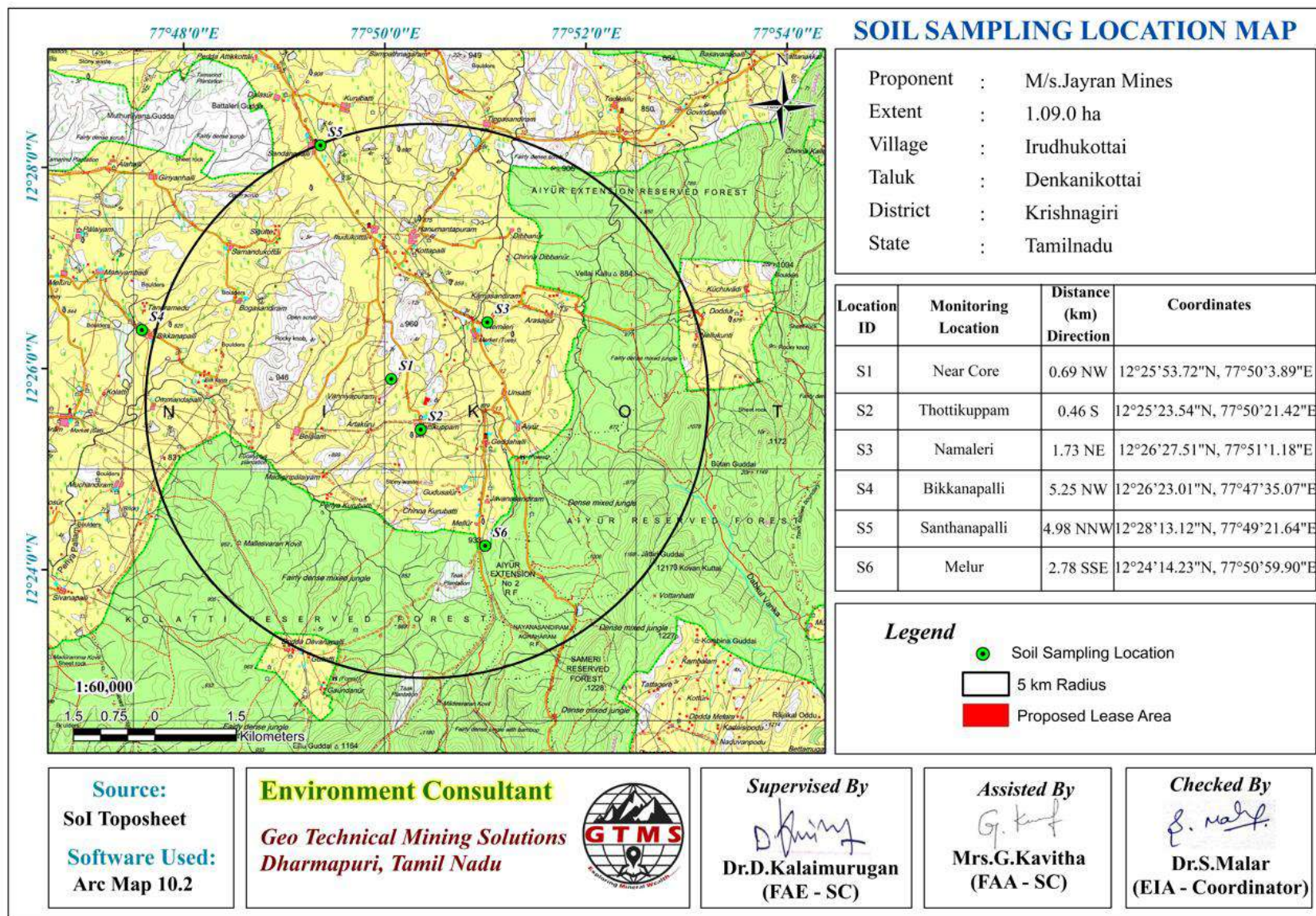
| Sampling ID | Location      | Distance | Coordinates                  |
|-------------|---------------|----------|------------------------------|
| S1          | Nearby Core   | 0.69 NW  | 12°25'53.72"N, 77°50'3.89"E  |
| S2          | Thottikuppam  | 0.46 S   | 12°25'23.54"N, 77°50'21.42"E |
| S3          | Namaleri      | 1.73 NE  | 12°26'27.51"N, 77°51'1.18"E  |
| S4          | Bikkanapalli  | 5.25 NW  | 12°26'23.01"N, 77°47'35.07"E |
| S5          | Santhanapalli | 4.98 NNW | 12°28'13.12"N, 77°49'21.64"E |
| S6          | Melur         | 2.78 SSE | 12°24'14.23"N, 77°50'59.90"E |

Source: On-site monitoring/sampling by *Greenlink Analytical and Research Laboratory (India) Private Ltd*, in association with GTMS.

#### 3.2.2 Results and Discussion

##### *Physical Characteristics*

The soil samples in the study area show loamy textures varying between silty clay loam, silty loam and sandy loam. pH of the soil varies from 6.4 to 7.9 indicating slightly acidic to slightly alkaline nature. Electrical conductivity of the soil varies from 43.85 to 133.2  $\mu\text{S}/\text{cm}$  Potassium ranges between 1077 and 3056 %, Calcium ranges between 4455 and 21085 mg/kg. Organic matter content ranges between 0.17 and 0.71%.



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

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

| S. No | Name of the Test                      | Units              | S1<br>Near Core | S2<br>Thottikuppam | S3<br>Namaleri | S4<br>Bikkanapalli | S5<br>Santhanapalli | S6<br>Melur  |
|-------|---------------------------------------|--------------------|-----------------|--------------------|----------------|--------------------|---------------------|--------------|
| 1     | pH value @ 25°C                       | ---                | 7.10            | 7.26               | 7.40           | 7.90               | 6.40                | 6.90         |
| 2     | Specific Electrical Conductivity@25°C | µS/Cm              | 72.0            | 130.0              | 120.0          | 110.0              | 43.0                | 97.0         |
| 3     | Total Organic Carbon                  | %                  | 0.41            | 0.10               | 0.06           | 0.14               | 0.07                | 0.11         |
| 4     | Available Nitrogen                    | Kg/ha              | 236             | 260                | 198            | 174                | 208                 | 148          |
| 5     | Available Potassium                   | Kg/ha              | 117             | 1077               | 1628           | 3056               | 2334                | 209          |
| 6     | Available Phosphorous                 | mg/kg              | 46.3            | 23.0               | 141.6          | 258                | 6.3                 | 66.6         |
| 7     | Available Calcium as Ca               | mg/kg              | 1130            | 2108               | 1162           | 1162               | 445                 | 1411         |
| 8     | Available Magnesium as Mg             | mg/kg              | 950             | 1022               | 951            | 951                | 479                 | 743          |
| 9     | Moisture                              | %                  | 17.36           | 16.84              | 17.52          | 19.58              | 21.54               | 18.49        |
| 10    | Total Organic Matter                  | %                  | 0.71            | 0.17               | 0.5            | 0.24               | 0.12                | 0.19         |
| 11    | Bulk Density                          | Kg/cm <sup>3</sup> | 1328            | 1122               | 1406           | 1233               | 2458                | 1135         |
| 12    | Porosity                              | %                  | 31              | 38                 | 42             | 34                 | 32                  | 38           |
| 13    | Copper as Cu                          | ppm                | 39.7            | 30.9               | 37.7           | 37.5               | 12.6                | 35           |
| 14    | Nickel as Ni                          | ppm                | BDL [DL 0.1]    | BDL [DL 0.1]       | BDL [DL 0.1]   | BDL [DL 0.1]       | BDL [DL 0.1]        | BDL [DL 0.1] |
| 15    | Zinc as Zn                            | ppm                | 23.5            | 25                 | 13.9           | 60.7               | 16                  | 19.4         |
| 16    | Total Iron as Fe                      | ppm                | 34306           | 38087              | 22816          | 26768              | 41581               | 29918        |
| 17    | Lead                                  | ppm                | 1.5             | 1.21               | 1.59           | 5.7                | 1.03                | 2.02         |
| 18    | Texture                               | -                  | Silt Loam       | Clay Loam          | Clay Loam      | Silt Loam          | Silt Clay Loam      | Silt Loam    |
| 19    | Sand                                  | %                  | 29.10           | 20.40              | 22.30          | 33.30              | 8.50                | 33.50        |
| 20    | Silt                                  | %                  | 54.40           | 44.20              | 42.10          | 51.40              | 57.30               | 52.10        |
| 21    | Clay                                  | %                  | 16.50           | 35.40              | 35.60          | 15.30              | 34.20               | 14.40        |

Source: Sampling Results by **Greenlink Analytical and Research Laboratory (India) Private Ltd**, in association with GTMS

### 3.3 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**

| Location ID | Monitoring Locations | Distance & Direction | Coordinates                  |
|-------------|----------------------|----------------------|------------------------------|
| SW1         | Namaleri Lake        | 1.65 NE              | 12°26'29.53"N, 77°50'53.10"E |
| SW2         | Thippasandiram Lake  | 4.65 NE              | 12°28'10.94"N, 77°50'55.88"E |
| BW1         | Thottikuppam         | 0.36 S               | 12°25'26.58"N, 77°50'21.59"E |
| BW2         | Melur                | 2.57 SE              | 12°24'20.56"N, 77°50'56.65"E |
| BW3         | Santhanapalli        | 4.94 NW              | 12°28'11.09"N, 77°49'19.63"E |
| OW1         | Bikkanapalli         | 5.55 NW              | 12°26'30.09"N, 77°47'26.60"E |

Source: On-site monitoring/sampling Greenlink Analytical and Research Laboratory (India) Private Ltd, in association with GTMS.

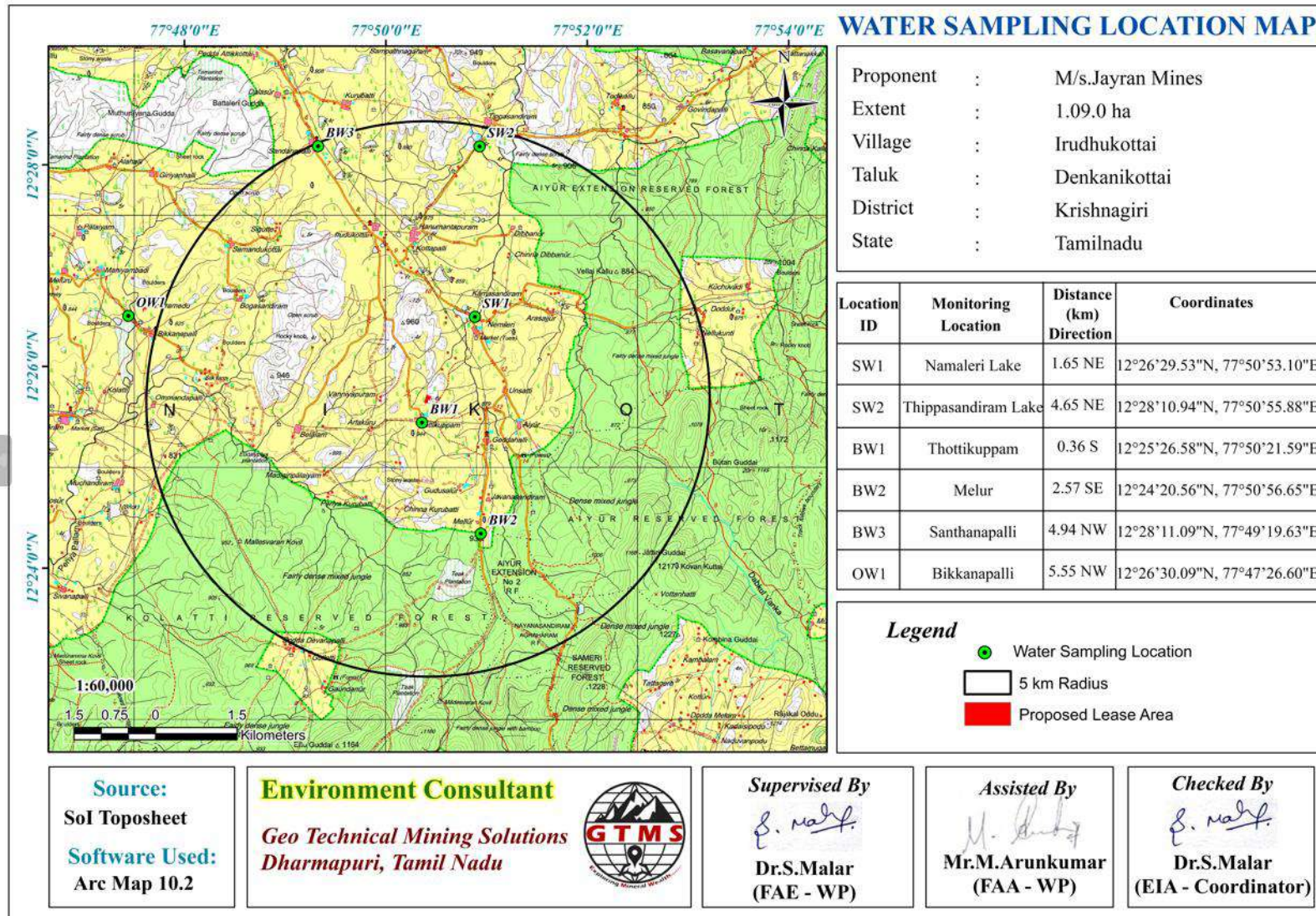
#### **Surface Water Resources and Quality**

Namaleri Lake and Thippasandiram Lake are the two prominent surface water resources present in the study area. These are ephemeral in nature, which convey water only after rainfall events. Three surface water samples, known as SW1 and SW2 were collected from the three surface water bodies to assess the baseline water quality. Table 3.6 summarizes surface water quality data of the three samples. Results for surface water samples in the Table 3.6 indicate that the physical, chemical and biological parameters, and heavy metals are within permissible limits in comparison with standards of IS10500:2012.

#### **Ground Water Resources and Quality**

Groundwater in the study area occurs in the Peninsular Gneiss and Charnockite Gneiss. The movement of the groundwater is controlled by the intensity of weathering and fracturing of crystalline rocks. Dug wells and bore wells are the most common ground water abstraction structures in the area. However, in dry season, people in the study area heavily rely on bore wells for their domestic and agriculture purpose. Four groundwater samples, known as BW1, BW2, BW3 and OW1 were collected from open well and bore well and analysed for physico-chemical conditions, heavy metals and bacteriological contents in order to assess baseline quality of ground water. Ground water sampling locations and their distance and direction from the lease area are provided in Table 3.5 and the spatial occurrence of water sampling locations is shown in Figure 3.6. Table 3.6 summarizes ground water quality data of the four samples Results for ground water samples in the Table 3.6 indicate that the physical, chemical and biological parameters, and heavy metals are within permissible limits in comparison with standards of IS10500:2012.





**Figure 3.6 Map showing water sampling locations within 5 km radius around the proposed project site**

**Table 3.6 Water Quality Result**

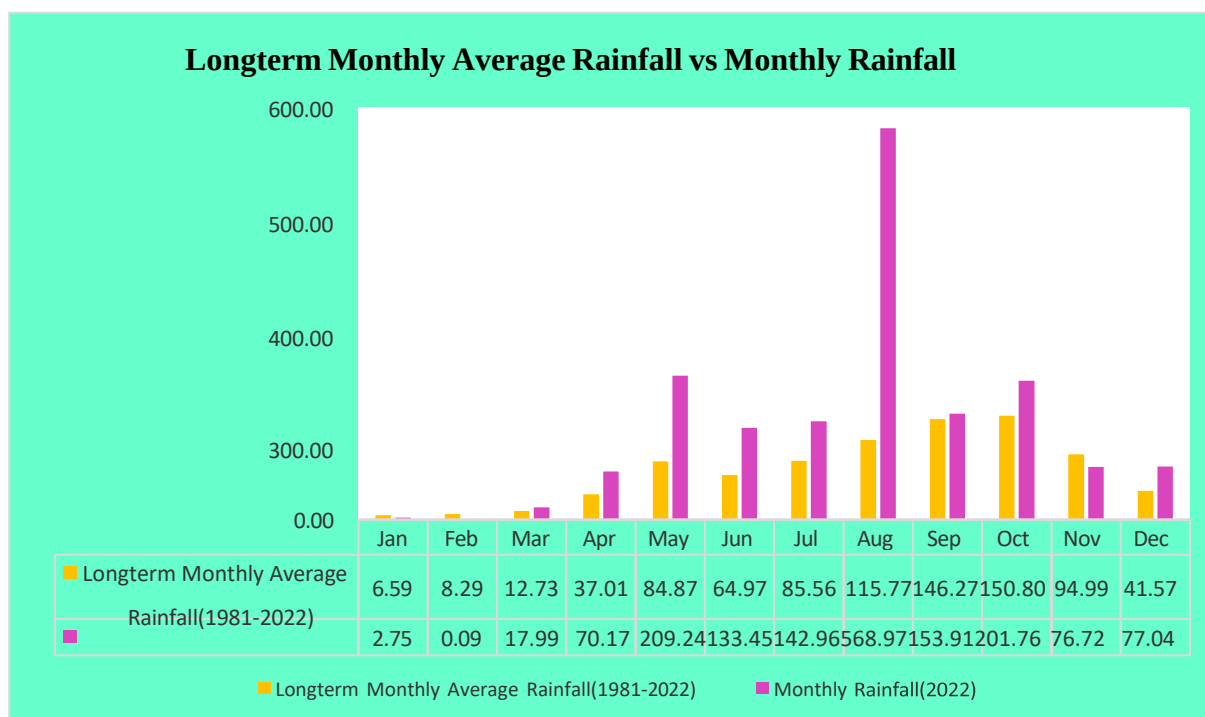
| S. No. | Parameters                            | Units  | Results     |             |             |             |             |             |
|--------|---------------------------------------|--------|-------------|-------------|-------------|-------------|-------------|-------------|
|        |                                       |        | SW1         | SW2         | BW1         | BW2         | BW3         | OW1         |
| 1      | pH value @ 25°C                       | --     | 6.9         | 7.0         | 7.3         | 7.1         | 7.8         | 7.2         |
| 2      | TDS                                   | mg/l   | 189.0       | 476.0       | 1144.0      | 896.0       | 1023.0      | 652.0       |
| 3      | EC @ 25°C                             | µS/cm  | 304.0       | 740.0       | 1455.0      | 1756.0      | 1278.0      | 987.0       |
| 4      | Turbidity                             | NTU    | 0.6         | 0.5         | <0.1        | <0.1        | <0.1        | <0.1        |
| 5      | Colour                                | Hazen  | <1.0        | 5.0         | <1.0        | <1.0        | <1.0        | <1.0        |
| 6      | Calcium (Ca)                          | mg /l  | 135.0       | 68.0        | 176.0       | 132.0       | 174.0       | 110.0       |
| 7      | Magnesium (Mg)                        | mg/l   | 78.0        | 21.0        | 24.0        | 17.0        | 43.0        | 21.0        |
| 8      | Chlorides (Cl)                        | mg /l  | 63.0        | 134.0       | 178.0       | 179.0       | 201.0       | 95.0        |
| 9      | Sulphates (SO <sub>4</sub> )          | mg/l   | 29.0        | 64.0        | 76.0        | 79.0        | 92.0        | 38.0        |
| 10     | Silica (as SiO <sub>2</sub> )         | mg/l   | 4.18        | 6.12        | 15.90       | 8.42        | 1.33        | 4.47        |
| 11     | Total Residual Chlorine               | mg/l   | BDL(DL-0.1) | BDL(DL-0.1) | BDL(DL-0.1) | BDL(DL-0.1) | BDL(DL-0.1) | BDL(DL-0.1) |
| 12     | Sodium (Na)                           | mg/l   | 12.48       | 30.88       | 37.12       | 41.2        | 36.9        | 19.7        |
| 13     | Total Hardness (CaCO <sub>3</sub> )   | mg/l   | 98.0        | 188.0       | 429.0       | 533.0       | 426.0       | 189.0       |
| 14     | Total Alkalinity (CaCO <sub>3</sub> ) | mg/l   | 145.0       | 176.0       | 215.0       | 316.0       | 319.0       | 278.0       |
| 15     | Fluoride (F)                          | mg/l   | <0.1        | <0.1        | 0.9         | 1.2         | 1.1         | 0.85        |
| 16     | Odour                                 | -      | Agreeable   | Agreeable   | Agreeable   | Agreeable   | Agreeable   | Agreeable   |
| 17     | Taste                                 | -      | Agreeable   | Agreeable   | Agreeable   | Agreeable   | Agreeable   | Agreeable   |
| 18     | Total Solids                          | mg/l   | 320.0       | 504.0       | 1188.0      | 906.0       | 1056.0      | 684.0       |
| 19     | Dissolved Oxygen                      | mg/l   | 2.2         | 2.6         | 1.6         | 2.90        | 1.72        | 3.60        |
| 20     | Phosphorous                           | mg/l   | 10.8        | 13.3        | 2.21        | 1.88        | 1.52        | 15.8        |
| 21     | Potassium (K)                         | mg/l   | 6.5         | 4.8         | 5.7         | 2.5         | 19.4        | 7.8         |
| 22     | Nitrite (NO <sub>2</sub> )            | mg/l   | BDL(DL-0.1) | BDL(DL-0.1) | BDL(DL-0.1) | BDL(DL-0.1) | 0.03        | 0.039       |
| 23     | Phenolphthalein Alkalinity            | mg/l   | 08.0        | 10.0        | 06.0        | 02.0        | BDL(DL-0.1) | 20.0        |
| 24     | Total Coliform                        | CFU/ml | Present     | Present     | Present     | Absent      | Absent      | Absent      |
| 25     | Escherichia Coli                      | CFU/ml | Present     | Present     | Present     | Absent      | Absent      | Absent      |

Source: Sampling Results by **Greenlink Analytical and Research Laboratory (India) Private Ltd**, in association with GTMS

### 3.3.1 Hydrogeological Studies

#### Rainfall

Rainfall data for the study area were collected for the period of 1981-2022 (POWER | Data Access Viewer (nasa.gov)). Long term monthly average rainfall was estimated from the data of 1981-2022 and compared with the monthly rainfall for the year 2022, shown in Figure 3.7. The Figure 3.7 shows that monthly rainfall in 2022 is generally high in the months of May, August and October, when compared to the long term monthly average rainfall.



**Figure 3.7 Long-term monthly average rainfall vs monthly rainfall**

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

#### 3.3.2 Groundwater Levels and Flow Direction

Data regarding depth to groundwater levels are essential to infer the direction of groundwater movement within the study area. Knowledge of groundwater flow direction is must in choosing location for background groundwater quality monitoring well and in locating recharge and discharge areas. Therefore, data regarding groundwater elevations were collected from 9 open wells and 9 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, 2024 (Post Monsoon Season).

The open well water level data thus collected onsite are provided in Tables 3.7 and 3.8. According to the data, average depths to the static water table in open wells range from 21.77 to 24.57

m BGL in pre monsoon and 17.97 to 18.93 m BGL in post monsoon. The bore well data thus collected onsite are provided in Tables 3.9 and 3.10. The average depths to static potentiometric surface in bore wells for the period of October through December 2024 (Post- Monsoon Season) vary from 79.10 to 77.80 m and from 83.07 to 80.43 m for the period of March through May, 2025 (Pre-Monsoon Season). Data on the depths to static water table and potentiometric surface were used to draw contour lines connecting groundwater elevation (also known as equipotential hydraulic head) to determine the groundwater flow direction perpendicular to the contour lines.

From the maps of open well groundwater flow direction shown in Figures 3.8- 3.9, it is understood that most of the open well groundwater for the post- and pre-monsoon seasons flows towards the open well number 9 located in SE direction of the proposed project site. The groundwater flow maps in Figure 3.10-3.11 show that most of the bore well groundwater for the post- and pre-monsoon seasons flow towards the bore well number 8. It is located in East direction of the proposed project site. On the basis of the groundwater flow information, both open wells and bore wells mentioned above can be chosen for water quality monitoring purpose as the wells may get easily affected by the contaminants resulting from the mining activities of the sites in future.

**Table 3.7 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       | 20.7                                | 21.5     | 23.4      | 21.87   | 12°25'43.04"N | 77°50'15.39"E |
| OW02       | 21.3                                | 22.2     | 23.2      | 22.23   | 12°25'47.71"N | 77°49'50.51"E |
| OW03       | 20.8                                | 21.4     | 23.1      | 21.77   | 12°25'18.23"N | 77°50'1.16"E  |
| OW04       | 21.3                                | 22.1     | 22.5      | 21.97   | 12°25'59.74"N | 77°49'39.62"E |
| OW05       | 20.5                                | 21.9     | 23.1      | 21.83   | 12°26'16.77"N | 77°49'33.01"E |
| OW06       | 21.2                                | 21.8     | 23.4      | 22.13   | 12°26'34.68"N | 77°50'33.01"E |
| OW07       | 20.5                                | 26.1     | 27.1      | 24.57   | 12°26'18.65"N | 77°50'46.22"E |
| OW08       | 20.9                                | 25.2     | 27.3      | 24.47   | 12°25'37.69"N | 77°51'5.54"E  |
| OW09       | 21.4                                | 24.8     | 27.5      | 24.57   | 12°24'56.08"N | 77°50'56.97"E |

Source: Onsite monitoring data

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

| Station ID | Depth to Static Water Table BGL (m) |          |          |         | Latitude      | Longitude     |
|------------|-------------------------------------|----------|----------|---------|---------------|---------------|
|            | Oct-2023                            | Nov-2023 | Dec-2023 | Average |               |               |
| OW01       | 19.6                                | 17.8     | 16.5     | 17.97   | 12°25'43.04"N | 77°50'15.39"E |
| OW02       | 19.7                                | 17.4     | 16.8     | 17.97   | 12°25'47.71"N | 77°49'50.51"E |



|      |      |      |      |       |               |               |
|------|------|------|------|-------|---------------|---------------|
| OW03 | 20.2 | 19.2 | 17.1 | 18.83 | 12°25'18.23"N | 77°50'1.16"E  |
| OW04 | 19.9 | 18.5 | 16.8 | 18.40 | 12°25'59.74"N | 77°49'39.62"E |
| OW05 | 20.2 | 19.4 | 17.2 | 18.93 | 12°26'16.77"N | 77°49'33.01"E |
| OW06 | 20.2 | 19.2 | 16.5 | 18.63 | 12°26'34.68"N | 77°50'33.01"E |
| OW07 | 19.6 | 19.6 | 16.8 | 18.67 | 12°26'18.65"N | 77°50'46.22"E |
| OW08 | 20.4 | 19.4 | 16.4 | 18.73 | 12°25'37.69"N | 77°51'5.54"E  |
| OW09 | 20.6 | 18.8 | 17.2 | 18.87 | 12°24'56.08"N | 77°50'56.97"E |

Source: Onsite monitoring data

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

| Station ID | Depth to Static Potentiometric Surface BGL(m) |          |           |         | Latitude      | Longitude     |
|------------|-----------------------------------------------|----------|-----------|---------|---------------|---------------|
|            | Mar-2024                                      | Apr-2024 | May- 2024 | Average |               |               |
| BW01       | 84.3                                          | 81.7     | 78.2      | 81.33   | 12°25'26.53"N | 77°50'21.57"E |
| BW02       | 85.2                                          | 82.3     | 78.3      | 81.8    | 12°25'23.10"N | 77°49'55.27"E |
| BW03       | 84.3                                          | 81.4     | 77.1      | 80.83   | 12°25'39.54"N | 77°49'56.21"E |
| BW04       | 82.9                                          | 88.8     | 77.5      | 83.07   | 12°25'50.45"N | 77°49'25.84"E |
| BW05       | 84.5                                          | 81.6     | 77.2      | 81.2    | 12°26'18.53"N | 77°49'49.39"E |
| BW06       | 85.2                                          | 81.5     | 77.5      | 81.37   | 12°26'11.98"N | 77°50'59.63"E |
| BW07       | 83.6                                          | 81.4     | 77.9      | 81.03   | 12°25'57.44"N | 77°50'35.68"E |
| BW08       | 84.5                                          | 81.8     | 78.1      | 81.47   | 12°25'42.10"N | 77°51'12.89"E |
| BW09       | 84.3                                          | 79.6     | 77.5      | 80.43   | 12°24'48.94"N | 77°50'37.73"E |

Source: Onsite monitoring data

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

| Station ID | Depth to Static Potentiometric Surface BGL(m) |          |          |         | Latitude      | Longitude     |
|------------|-----------------------------------------------|----------|----------|---------|---------------|---------------|
|            | Oct-2023                                      | Nov-2023 | Dec-2023 | Average |               |               |
| BW01       | 75.3                                          | 77.9     | 80.8     | 78.00   | 12°25'26.53"N | 77°50'21.57"E |
| BW02       | 75.2                                          | 78.1     | 81.3     | 78.20   | 12°25'23.10"N | 77°49'55.27"E |
| BW03       | 74.4                                          | 77.2     | 82.5     | 78.03   | 12°25'39.54"N | 77°49'56.21"E |
| BW04       | 74.5                                          | 77.2     | 83.5     | 78.40   | 12°25'50.45"N | 77°49'25.84"E |
| BW05       | 74.7                                          | 77.6     | 82.3     | 78.20   | 12°26'18.53"N | 77°49'49.39"E |
| BW06       | 74.5                                          | 77.3     | 81.6     | 77.80   | 12°26'11.98"N | 77°50'59.63"E |
| BW07       | 75.3                                          | 78.4     | 82.5     | 78.73   | 12°25'57.44"N | 77°50'35.68"E |
| BW08       | 75.4                                          | 78.6     | 83.3     | 79.10   | 12°25'42.10"N | 77°51'12.89"E |
| BW09       | 74.4                                          | 78.4     | 80.8     | 77.87   | 12°24'48.94"N | 77°50'37.73"E |

Source: Onsite monitoring data

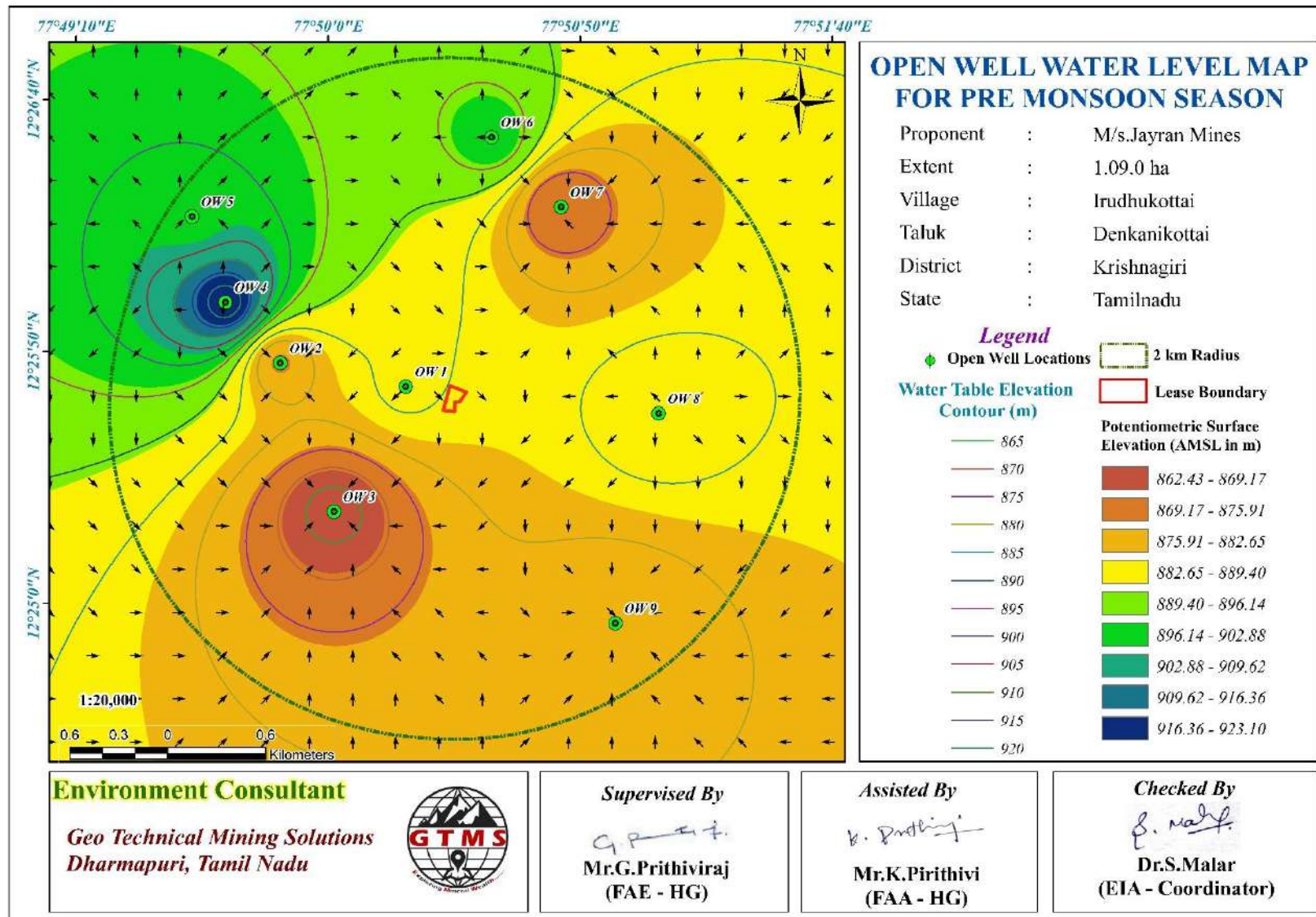
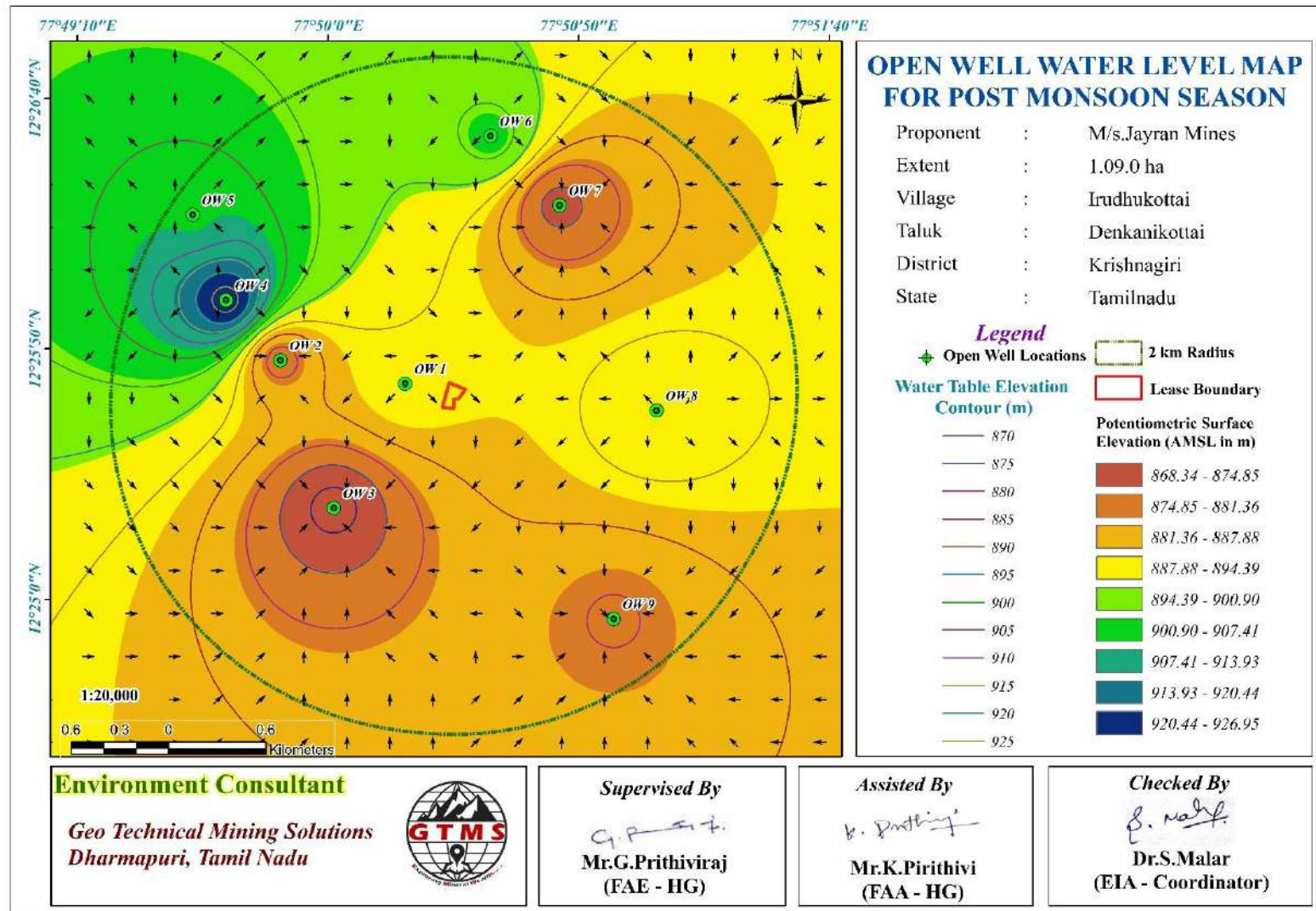


Figure 3.8 Open well Static Groundwater Elevation Map Showing Direction of Groundwater Flow during Pre-Monsoon Season



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



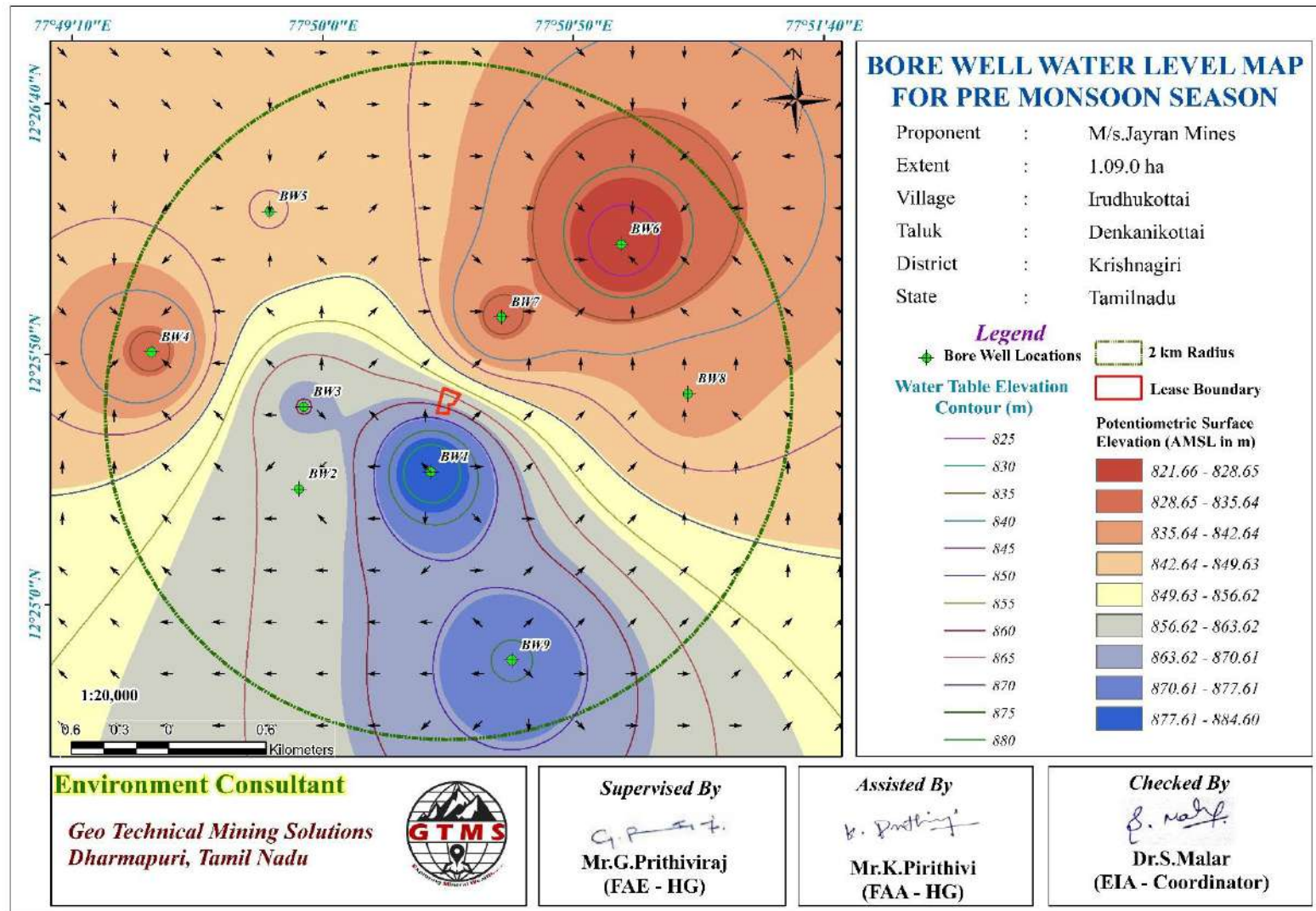


Figure 3.10 Borewell Static Groundwater Elevation Map Showing Direction of Groundwater Flow during Pre-Monsoon Season

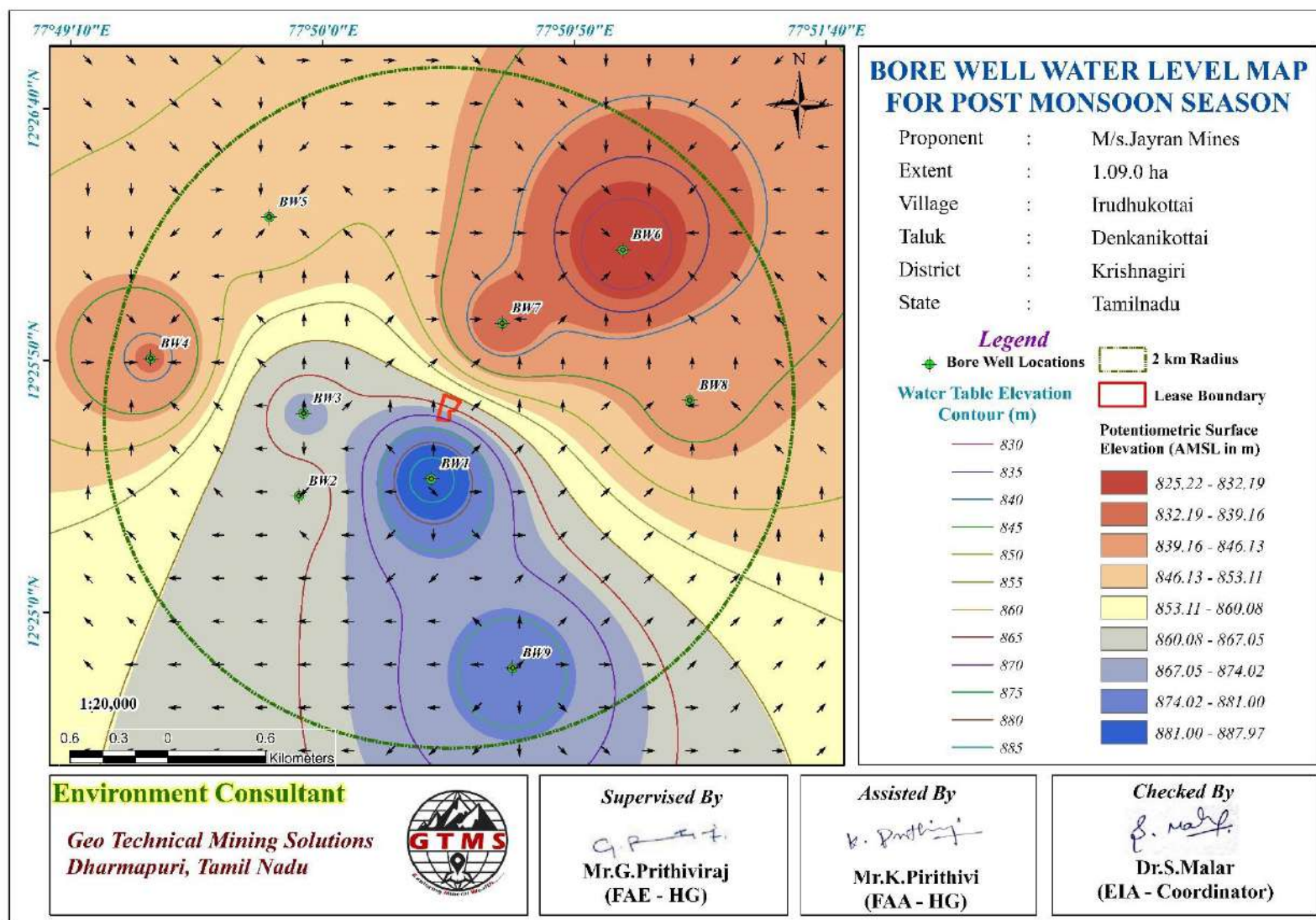


Figure 3.11 Borewell Static Groundwater Elevation Map Showing Direction of Groundwater Flow during Post-Monsoon Season

### 3.3.3 Electrical Resistivity Investigation

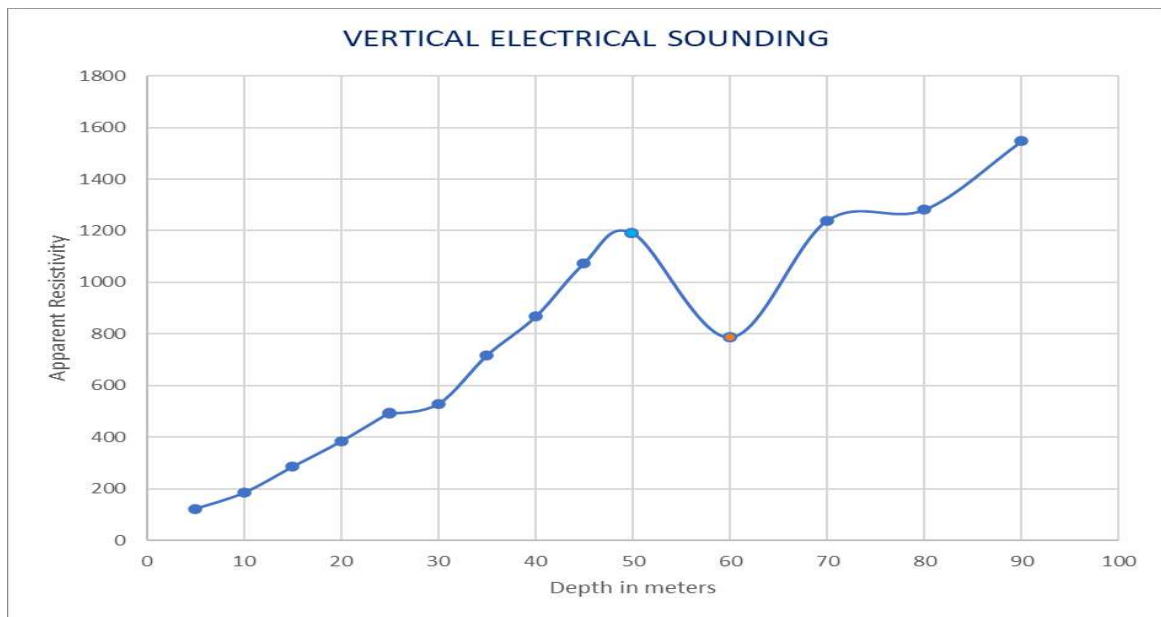
Electrical resistivity investigation is especially useful in the areas where there are no adequate exploratory well data about the aquifer conditions. The present study makes use of vertical electric sounding (VES) to delineate earth's subsurface layers. The electrical resistivity investigation uses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

#### **Result**

The Geophysical VES data obtained from the project site have been shown in Table 3.11. The field data obtained from a detailed geophysical investigation were plotted using excel spreadsheet for interpretation. The plot for the purpose of interpretation has been shown in Figure 3.12.

**Table 3.11 Vertical Electrical Sounding Data**

| Location Coordinates - 12°25'53.72"N, 77°50'3.89"E |             |             |                           |                           |                                       |
|----------------------------------------------------|-------------|-------------|---------------------------|---------------------------|---------------------------------------|
| S. No.                                             | AB/2<br>(m) | MN/2<br>(m) | Geometrical<br>Factor (G) | Resistance in<br>$\Omega$ | Apparent<br>Resistivity in $\Omega m$ |
| 1                                                  | 5           | 2           | 16.5                      | 8.016                     | 132.26                                |
| 2                                                  | 10          | 2           | 75.43                     | 2.578                     | 194.48                                |
| 3                                                  | 15          | 5           | 62.86                     | 4.699                     | 295.38                                |
| 4                                                  | 20          | 5           | 117.86                    | 3.345                     | 394.22                                |
| 5                                                  | 25          | 5           | 188.58                    | 2.683                     | 505.96                                |
| 6                                                  | 25          | 10          | 82.5                      | 6.061                     | 500.05                                |
| 7                                                  | 30          | 10          | 125.72                    | 4.288                     | 539.12                                |
| 8                                                  | 35          | 10          | 176.79                    | 4.117                     | 727.76                                |
| 9                                                  | 40          | 10          | 235.73                    | 3.722                     | 877.48                                |
| 10                                                 | 45          | 10          | 302.51                    | 3.583                     | 1083.91                               |
| 11                                                 | 50          | 20          | 165.01                    | 7.270                     | 1199.65                               |
| 12                                                 | 60          | 20          | 251.44                    | 3.167                     | 796.42                                |
| 13                                                 | 70          | 20          | 353.59                    | 3.535                     | 1249.9                                |
| 14                                                 | 80          | 20          | 471.45                    | 2.739                     | 1291.12                               |
| 15                                                 | 90          | 20          | 605.03                    | 2.573                     | 1556.68                               |
| 16                                                 | 100         | 20          | 754.32                    | 2.380                     | 1795.32                               |



**Figure 3.12 Graph Showing Occurrence of Water Bearing Fracture Zones at the Depth of 60m Below Ground Level in the Proposed Project Area**

The rock formation of low resistivity values indicates occurrence of water at the depth of about 60m below ground level. The maximum depth proposed for the proposed project is 21m below ground level. Therefore, the mining operation will not affect the aquifer throughout the entire mine life period.

### 3.4 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.

#### 3.4.1 Meteorology

##### *Climatic Variables*

A temporary meteorological station was installed at the project sites by covering cluster quarries. The station was installed at a height of 3 m above the ground level as there are no obstructions facilitating flow of wind, wind speed, wind direction, humidity and temperature. Meteorological data obtained from the onsite monitoring station are provided in Table 3.12. According to the onsite data, the temperature in March, 2024 varied from 17.78 to 38.79<sup>0</sup>C with the average of 28.07<sup>0</sup>C; in April, 2024 from 20.38 to 41.62<sup>0</sup>C with the average of 30.79<sup>0</sup>C; and in May, 2024 from 21.20 to 42.51<sup>0</sup>C with the average of 28.77<sup>0</sup>C. In March, 2024, relative humidity ranged from 12.38 to 100 % with the average of 43.93%; in April, 2024, from 12.19 to 98.06 % with the average of 43.11%; and in May, 2024, from 19.44 to 96.38 % with the average of 64.25%. The wind speed in March, 2024 varied from 0.06 to 6.83 m/s with the average of 3.33 m/s; in April, 2024 from

0.12 to 7.49m/s with the average of 3.67 m/s; and in May,2024 from 0.12 to 9.15 m/s with the average of 3.10m/s. In March,2024, wind direction varied from 2.33 to 312.14 with the average of 126.79<sup>0</sup>; in April, 2024, from 67.26 to 320.19<sup>0</sup> with the average of 131.42<sup>0</sup>; and in May,2024, from 9.27to 358.03<sup>0</sup> with the average of 184.68<sup>0</sup>. In March,2024, surface pressure varied from 93.60 to 94.69kPa with the average of 94.13kPa; in April, 2024, from 93.33 to 94.33kPa with the average of 93.84 kPa; and in May, 2024, from 93.01 to 94.19 kPa with the average of 93.62 kPa

**Table 3.12 Onsite Meteorological Data**

| S. No. | Parameters              |     | MARCH 2024 | APRIL 2024 | MAY 2024 |
|--------|-------------------------|-----|------------|------------|----------|
| 1      | Temperature (°C)        | Min | 17.48      | 20.38      | 21.20    |
|        |                         | Max | 38.79      | 41.62      | 42.51    |
|        |                         | Avg | 28.07      | 30.79      | 28.77    |
| 2      | Relative Humidity (%)   | Min | 12.38      | 12.19      | 19.44    |
|        |                         | Max | 100.00     | 98.06      | 96.38    |
|        |                         | Avg | 43.93      | 43.11      | 64.25    |
| 3      | Wind Speed (m/s)        | Min | 0.06       | 0.12       | 0.12     |
|        |                         | Max | 6.83       | 7.49       | 9.15     |
|        |                         | Avg | 3.33       | 3.67       | 3.10     |
| 4      | Wind Direction (degree) | Min | 2.33       | 67.26      | 9.27     |
|        |                         | Max | 312.14     | 320.19     | 358.03   |
|        |                         | Avg | 126.79     | 131.42     | 184.68   |
| 5      | Surface Pressure(kPa)   | Min | 93.60      | 93.33      | 93.01    |
|        |                         | Max | 94.69      | 94.33      | 94.19    |
|        |                         | Avg | 94.13      | 93.84      | 93.62    |

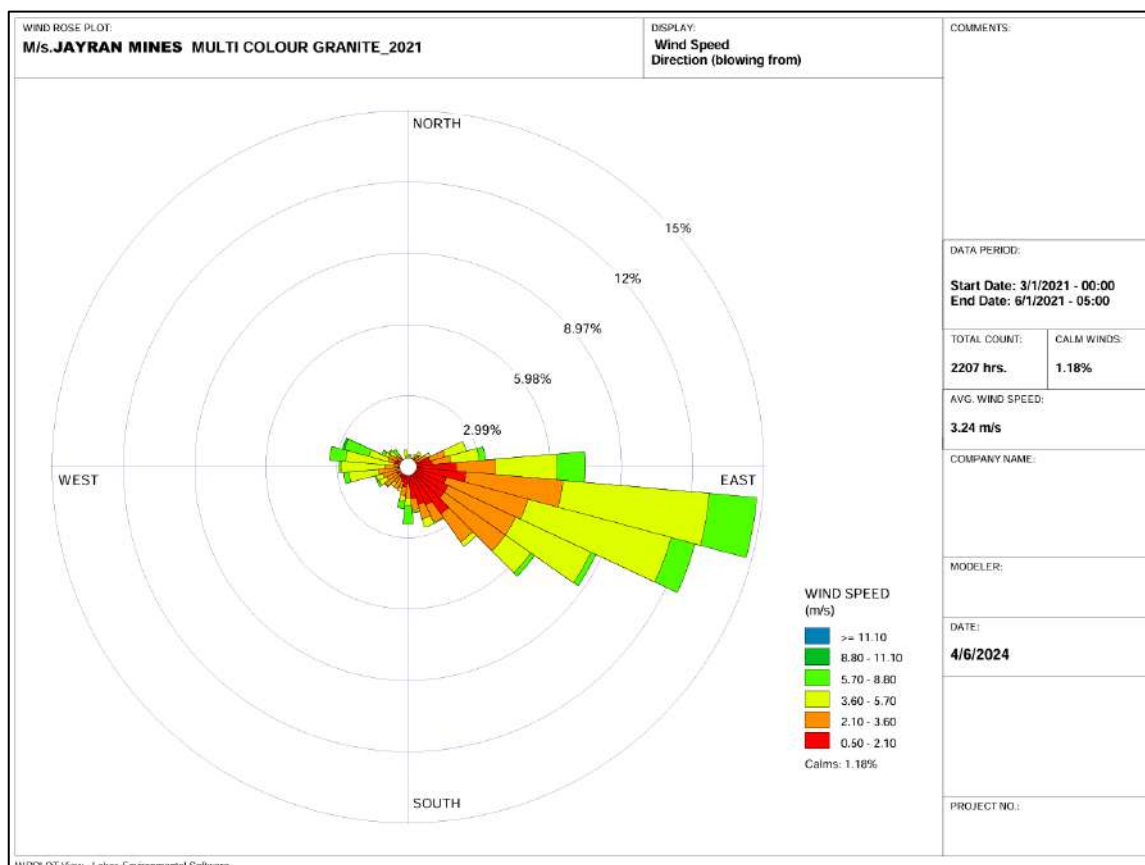
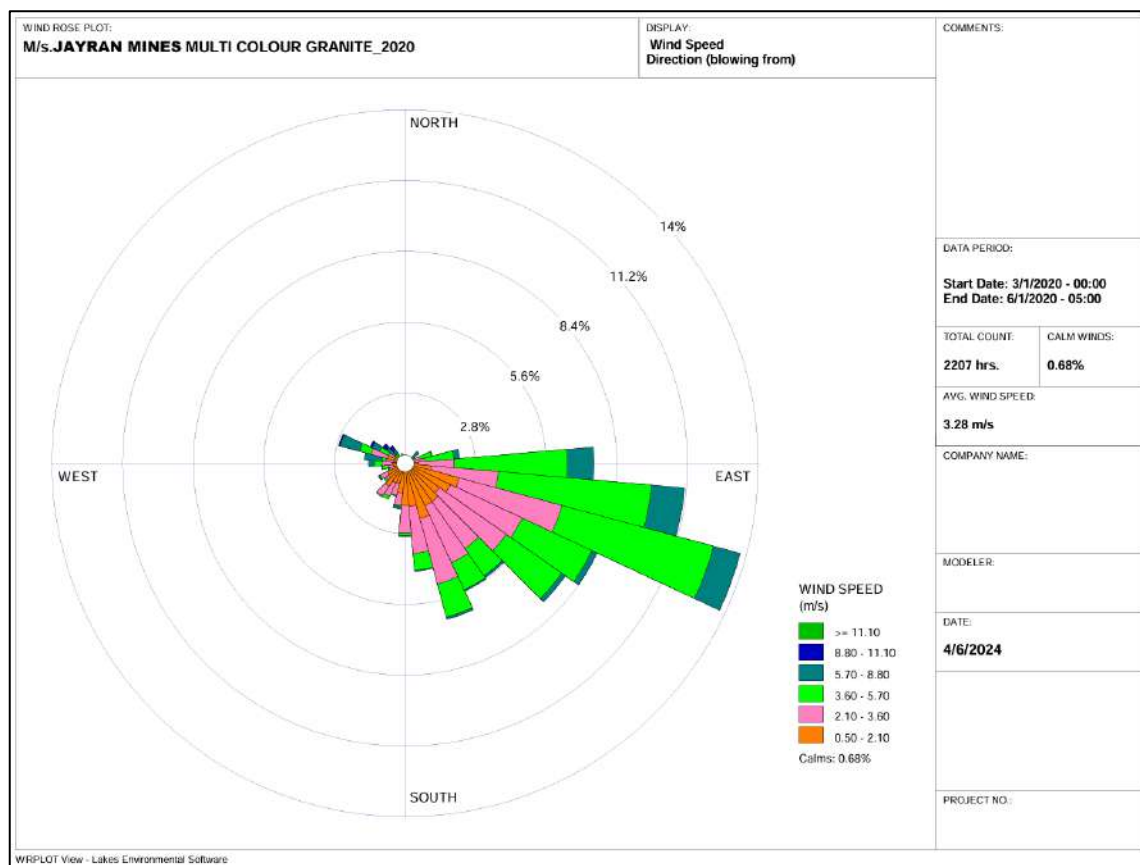
Source: Sampling Results by *Greenlink Analytical and Research Laboratory (India) Private Ltd*, in association with GTMS

### 3.4.2 Wind Pattern

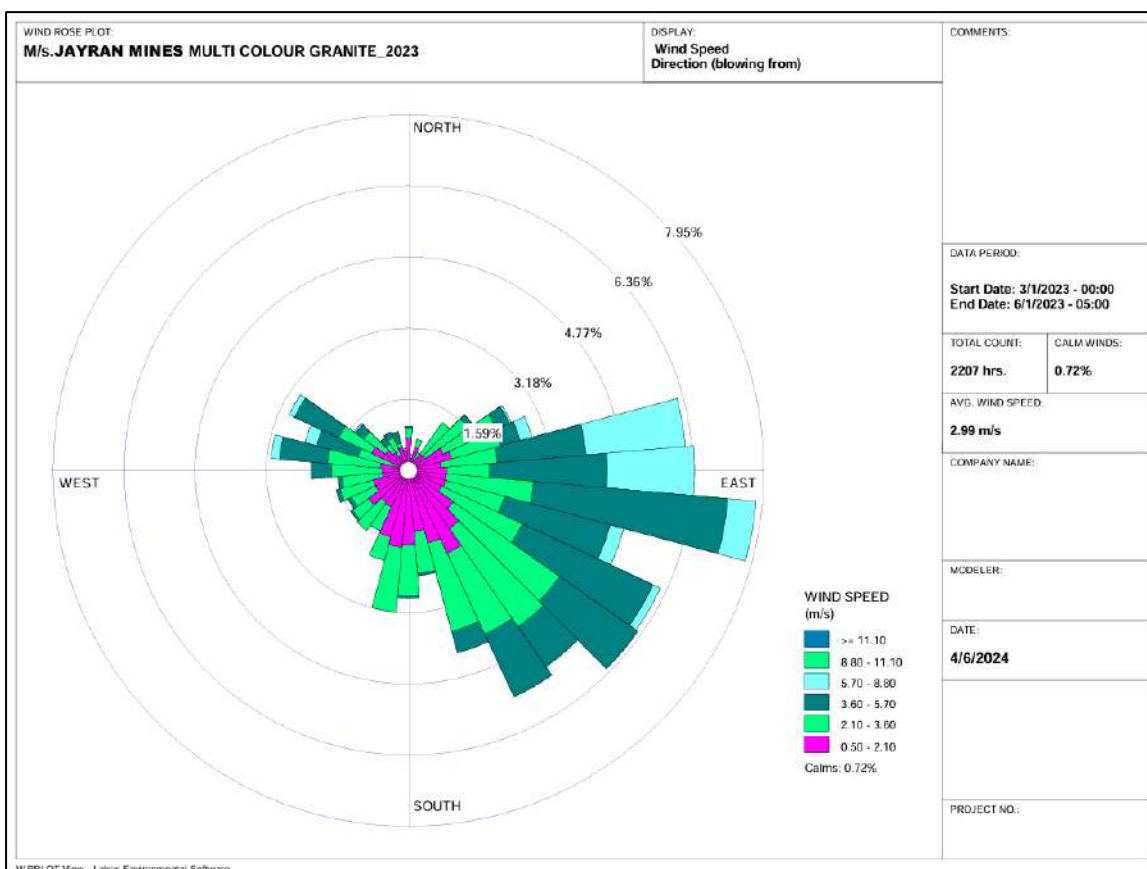
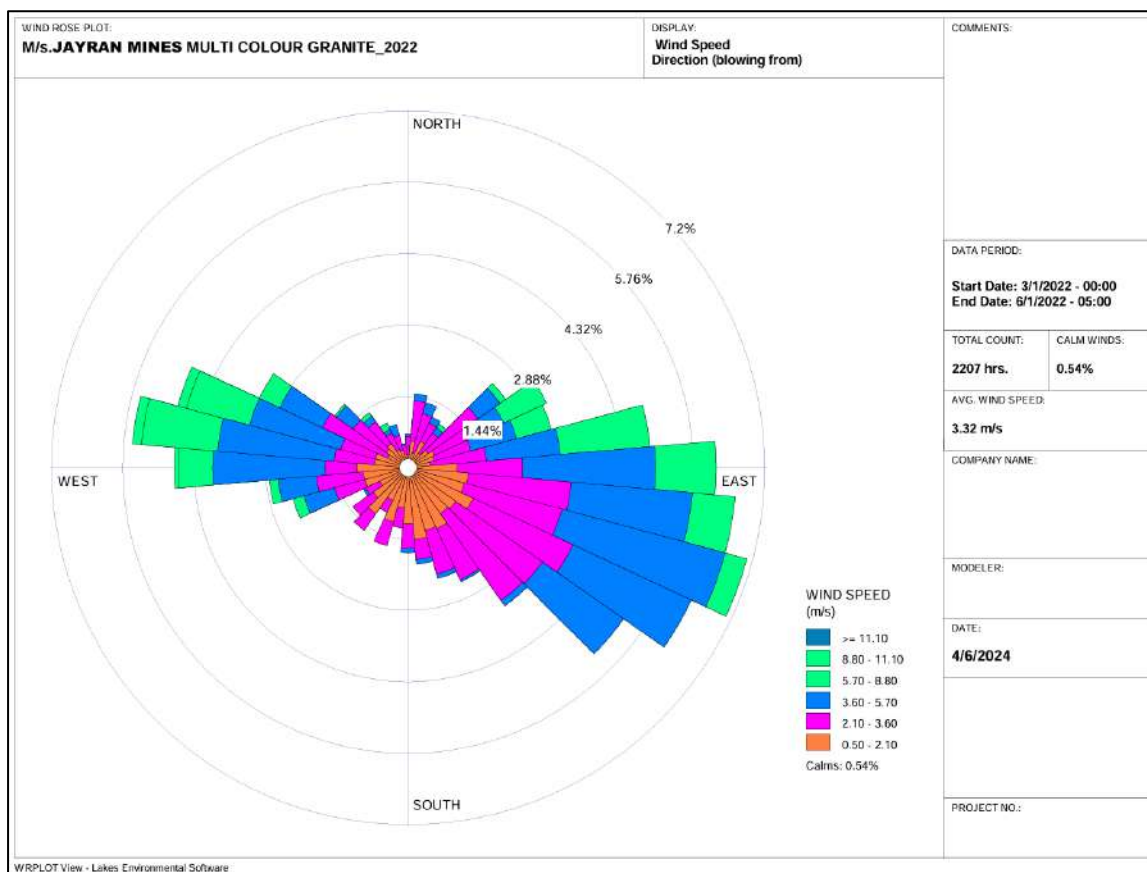
Wind pattern will largely influence the dispersion pattern of air pollutants and noise from the proposed project site. Analysis of wind pattern requires hourly site-specific data of wind speed and direction. Two types of wind rose were generated: historical seasonal wind rose for the period of March through May of the years from 2020 to 2023 and the seasonal wind rose for the study period of March through May 2024. The wind rose diagrams thus produced are shown in Figures 3.13-3.13a. Figure 3.14 reveals that:

- ❖ The measured average wind velocity during the study period is 3.36m/s.
- ❖ Predominant wind was dominant in the directions ranging from Southeast to Northwest.

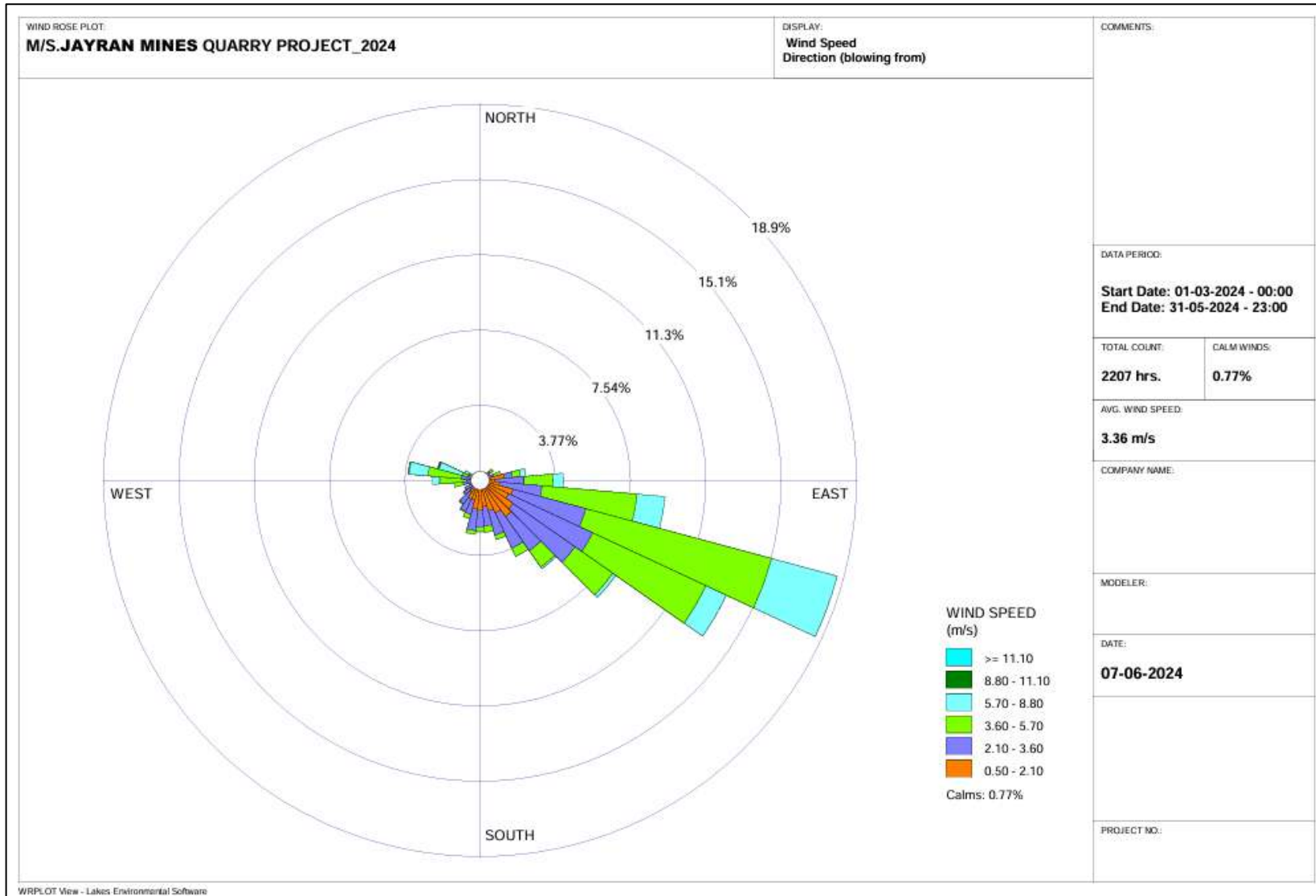




**Figure 3.13 Windrose Diagram for 2020 and 2021 (March to May)**



**Figure 3.13(a) Windrose Diagram for 2022 and 2023 (March to May)**



**Figure 3.14 Onsite Windrose Diagram**

### 3.4.3 Ambient Air Quality Study

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

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

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

| Parameter         | Method                                                   | Instrument                                        |
|-------------------|----------------------------------------------------------|---------------------------------------------------|
| PM <sub>2.5</sub> | Gravimetric method                                       | Fine Particulate Sampler                          |
|                   | Beta attenuation method                                  | Make – Thermo Environmental Instruments – TEI 121 |
| PM <sub>10</sub>  | Gravimetric method                                       | Respirable Dust Sampler                           |
|                   | Beta attenuation method                                  | Make –Thermo Environmental Instruments – TEI 108  |
| 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   |
| Free Silica       | NIOSH – 7601                                             | Visible Spectrophotometry                         |

Source: Sampling Results by *Greenlink Analytical and Research Laboratory (India) Private Ltd*, in association with GTMS

**Table 3.14 National Ambient Air Quality Standards**

| S. No. | Pollutant                              | Time Weighted Average      | Concentration in ambient air                 |                                                         |
|--------|----------------------------------------|----------------------------|----------------------------------------------|---------------------------------------------------------|
|        |                                        |                            | Industrial, Residential, Rural & other areas | Ecologically Sensitive area (Notified by Central Govt.) |
| 1      | SO <sub>2</sub> (µg/m <sup>3</sup> )   | Annual Avg.*<br>24 hours** | 50.0<br>80.0                                 | 20.0<br>80.0                                            |
| 2      | NO <sub>2</sub> (µg/m <sup>3</sup> )   | Annual Avg.<br>24 hours    | 40.0<br>80.0                                 | 30.0<br>80.0                                            |
| 3      | PM <sub>10</sub> (µg/m <sup>3</sup> )  | Annual Avg.<br>24 hours    | 60.0<br>100.0                                | 60.0<br>100.0                                           |
| 4      | 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                                            |

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

## Methodology

Ambient air quality monitoring was carried out with a frequency of two samples per week at Six (6) locations, adopting a continuous 24 hourly (3 shift of 8-hour) schedule for the period March-May, 2024 as per the CPCB, MoEF guidelines and notifications.

It was ensured that the equipment was placed preferably at a height of at least  $3 \pm 0.5$  m above the ground level at each monitoring station for negating the effects of wind-blown ground dust. The equipment was placed at space free from trees and vegetation which otherwise act as a sink of pollutants resulting in lower levels in monitoring results. The baseline data of ambient air were generated for PM<sub>10</sub>, PM<sub>2.5</sub>, sulphur dioxide (SO<sub>2</sub>) and nitrogen dioxide (NO<sub>x</sub>). The sampling locations are shown in Figure 3.15 & Table 3.15 average concentrations of air pollutants are summarized in Tables 3.16.

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

| S. No | Location Code | Monitoring Locations | Distance (km) | Direction | Coordinates   |               |
|-------|---------------|----------------------|---------------|-----------|---------------|---------------|
|       |               |                      |               |           | Lat           | Long          |
| 1     | AAQ1          | Near Core            | 0.90          | NW        | 12°25'56.08"N | 77°49'57.56"E |
| 2     | AAQ2          | Thottikuppam         | 0.33          | SW        | 12°25'28.31"N | 77°50'19.03"E |
| 3     | AAQ3          | Javanachandram       | 2.05          | SE        | 12°24'40.28"N | 77°50'59.21"E |
| 4     | AAQ4          | Bikkanapally         | 5.08          | NW        | 12°26'20.72"N | 77°47'40.32"E |
| 5     | AAQ5          | Giriyapalli          | 4.16          | N         | 12°27'58.50"N | 77°47'44.77"E |
| 6     | AAQ6          | Santhanapalli        | 5.51          | NNW       | 12°28'37.19"N | 77°49'40.32"E |

Source: Sampling Results by **Greenlink Analytical and Research Laboratory (India) Private Ltd**, in association with GTMS

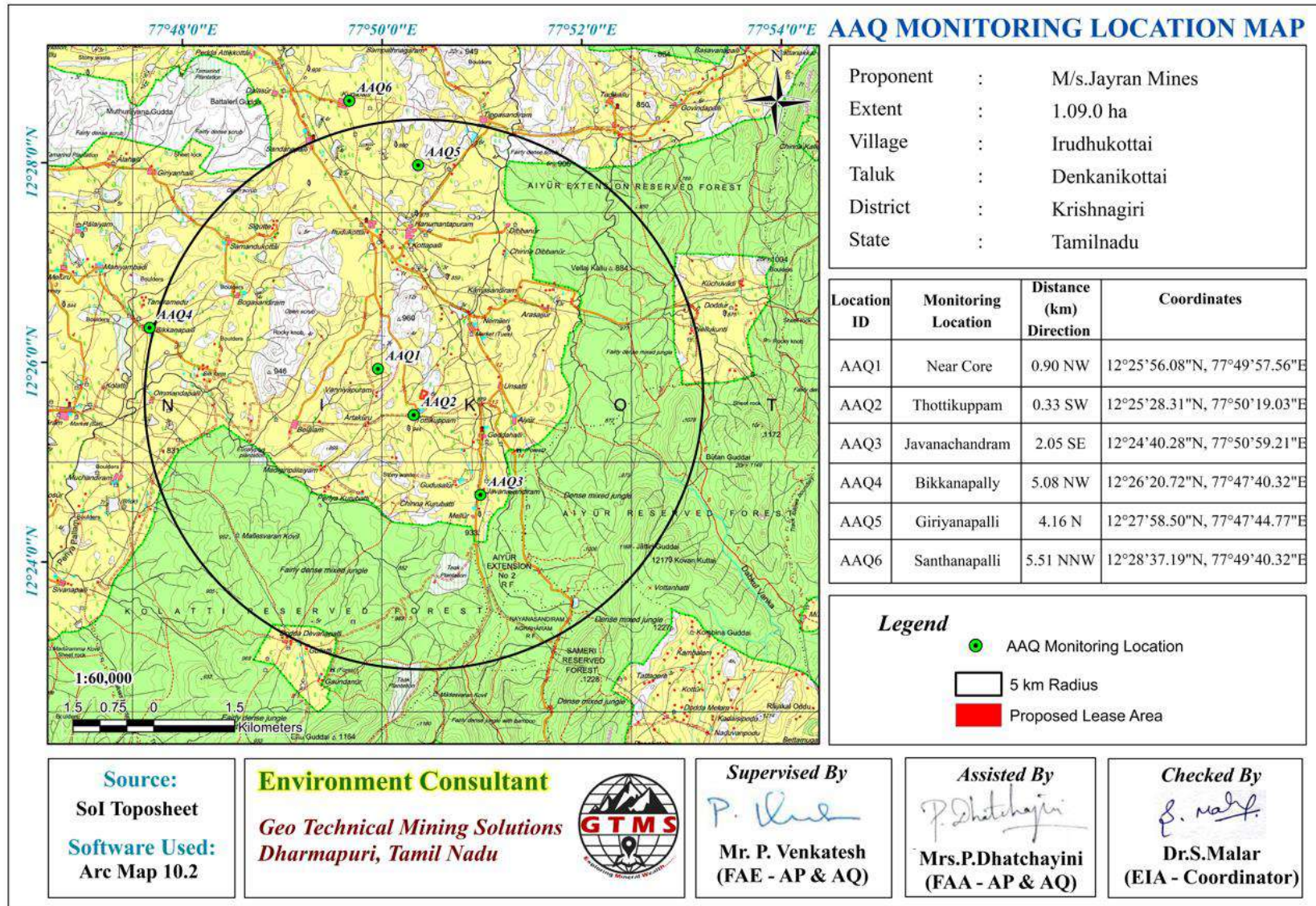
## Results

As per the monitoring data, PM<sub>2.5</sub> ranges from 13.4 µg/m<sup>3</sup> to 15.8 µg/m<sup>3</sup>; PM<sub>10</sub> from 35.7 µg/m<sup>3</sup> to 42.2µg/m<sup>3</sup>; SO<sub>2</sub> from 2.4 µg/m<sup>3</sup> to 4.2 µg/m<sup>3</sup>; NO<sub>x</sub> from 6.7 µg/m<sup>3</sup> to 11.5 g/m<sup>3</sup>. The concentration levels of the pollutants fall within the acceptable limits of NAAQS prescribed by CPCB.

## Air quality Index (AQI)

The AQI shows that the air quality of the study area falls within good category 39 causing minimal impact to human health.





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

**Table 3.16 Summary of AAQ Result**

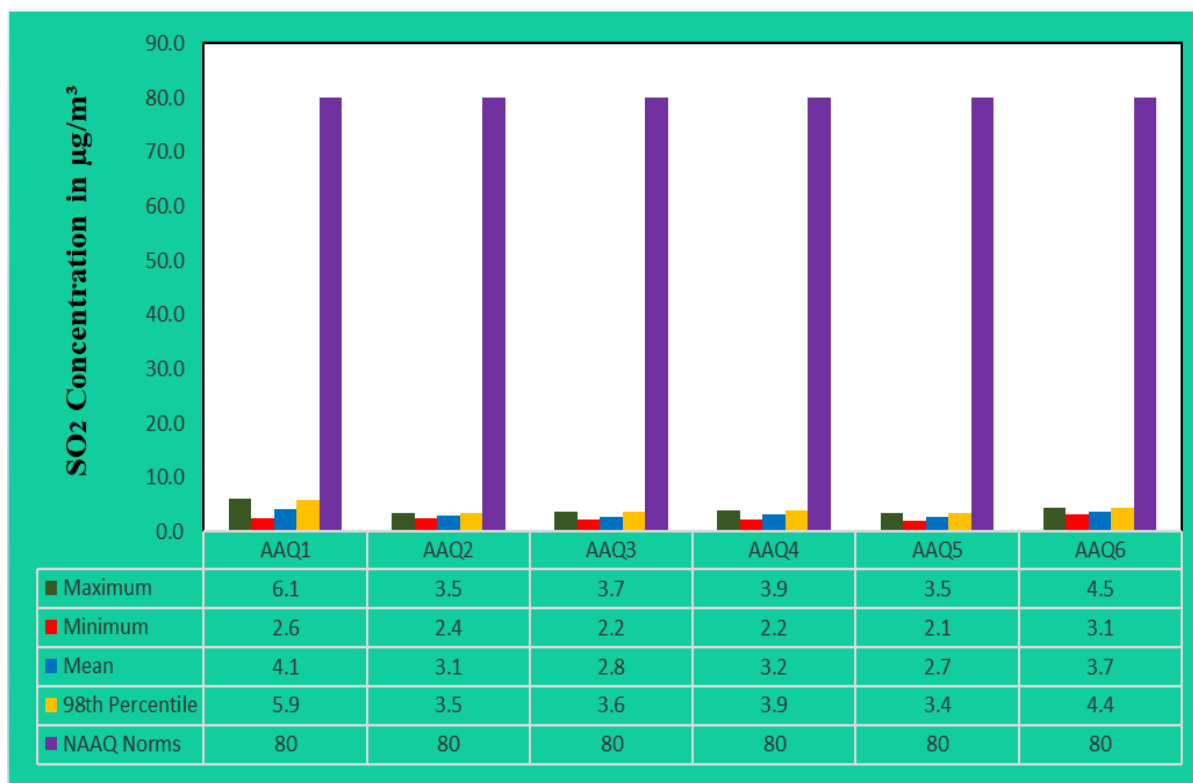
| PM <sub>2.5</sub> |      |      |      |                             | PM <sub>10</sub> |      |      |                             |
|-------------------|------|------|------|-----------------------------|------------------|------|------|-----------------------------|
| Station ID        | Max  | Min  | Mean | 98 <sup>th</sup> Percentile | Max              | Min  | Mean | 98 <sup>th</sup> Percentile |
| AAQ1              | 16.5 | 12.4 | 15.5 | 16.5                        | 47.1             | 35.3 | 44.3 | 47.1                        |
| AAQ2              | 15.0 | 13.7 | 14.4 | 15.0                        | 42.9             | 39.1 | 41.0 | 42.9                        |
| AAQ3              | 14.4 | 11.8 | 13.3 | 14.0                        | 35.9             | 29.4 | 33.2 | 35.9                        |
| AAQ4              | 16.2 | 14.1 | 15.1 | 16.2                        | 40.6             | 35.3 | 37.7 | 40.5                        |
| AAQ5              | 17.5 | 14.4 | 15.7 | 17.5                        | 43.8             | 36.0 | 39.3 | 43.8                        |
| AAQ6              | 15.2 | 13.9 | 14.6 | 15.2                        | 42.9             | 39.1 | 41.0 | 42.9                        |
| SO <sub>2</sub>   |      |      |      |                             | NO <sub>2</sub>  |      |      |                             |
| AAQ1              | 6.1  | 2.6  | 4.1  | 5.9                         | 15.3             | 6.5  | 9.5  | 14.7                        |
| AAQ2              | 3.5  | 2.4  | 3.1  | 3.5                         | 8.8              | 6.0  | 7.1  | 8.8                         |
| AAQ3              | 3.7  | 2.2  | 2.8  | 3.6                         | 11.8             | 7.0  | 8.2  | 11.5                        |
| AAQ4              | 3.9  | 2.2  | 3.2  | 3.9                         | 10.9             | 6.2  | 8.1  | 10.9                        |
| AAQ5              | 3.5  | 2.1  | 2.7  | 3.4                         | 10.9             | 6.5  | 7.6  | 10.6                        |
| AAQ6              | 4.5  | 3.1  | 3.7  | 4.4                         | 11.3             | 7.8  | 8.5  | 11.0                        |



**Figure 3.16 Bar Chart Showing Maximum, Minimum, and Average Concentrations of PM<sub>2.5</sub> Measured from 6 Air Quality Monitoring Stations within 5 km Radius**



**Figure 3.17 Bar Chart Showing Maximum, Minimum, and Average Concentrations of PM<sub>10</sub> Measured from 6 Air Quality Monitoring Stations within 5 km Radius**

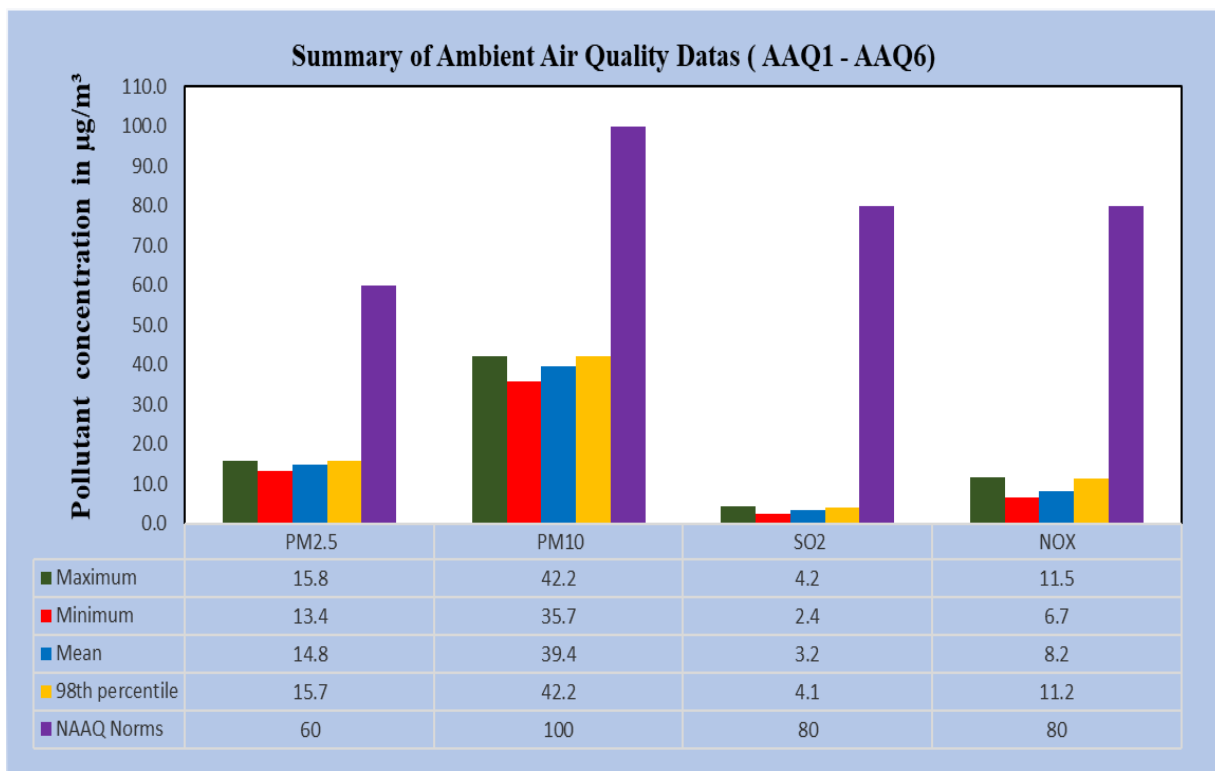


**Figure 3.18 Bar Chart Showing Maximum, Minimum, and Average Concentrations of SO<sub>2</sub> Measured from 6 Air Quality Monitoring Stations within 5 km Radius**





**Figure 3. 19 Bar Chart Showing Maximum, Minimum, And Average Concentrations of NO<sub>x</sub> Measured from 6 Air Quality Monitoring Stations within 5 km Radius**



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

### 3.5 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 six (6) locations covering commercial, residential, rural areas within the radius of 5 km. Details of noise monitoring locations are provided in Table 3.17 and spatial occurrence of the locations are shown in Figure 3.23.

**Table 3.17 Noise Monitoring Locations**

| Location Code | Monitoring Locations | Distance in km | Direction | Coordinates   |               |
|---------------|----------------------|----------------|-----------|---------------|---------------|
|               |                      |                |           | Lat           | Long          |
| N1            | Near Core            | 0.86           | NW        | 12°25'55.12"N | 77°49'58.55"E |
| N2            | Thottikuppam         | 0.26           | SSW       | 12°25'30.18"N | 77°50'20.67"E |
| N3            | Jayanachandram       | 2.03           | SE        | 12°24'40.65"N | 77°50'58.35"E |
| N4            | Bikkanapally         | 5.03           | NW        | 12°26'19.60"N | 77°47'41.83"E |
| N5            | Giriyanaipalli       | 6.29           | NW        | 12°27'55.53"N | 77°47'45.33"E |
| N6            | Santhanapalli        | 5.52           | NNW       | 12°28'36.79"N | 77°49'38.36"E |

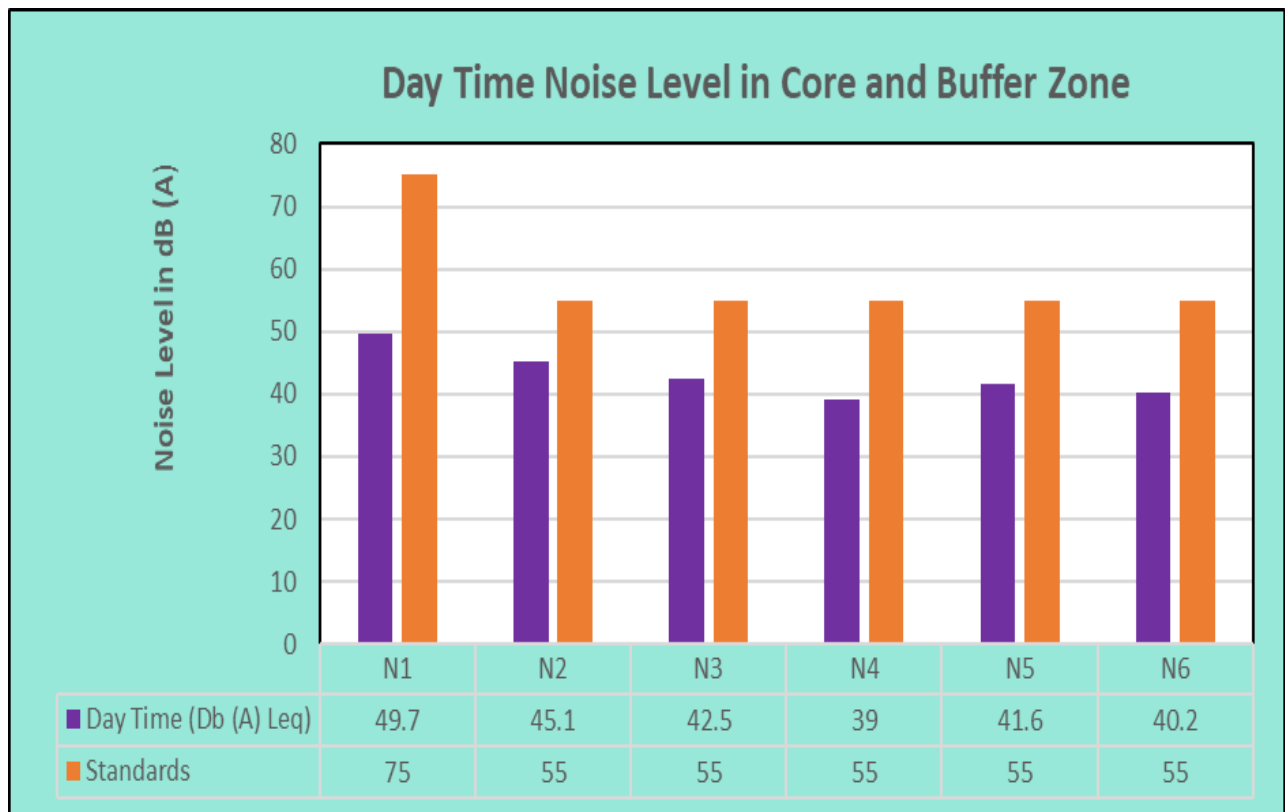
Source: Sampling Results by **Greenlink Analytical and Research Laboratory (India) Private Ltd**, in association with GTMS

**Table 3.18 Ambient Noise Quality Result**

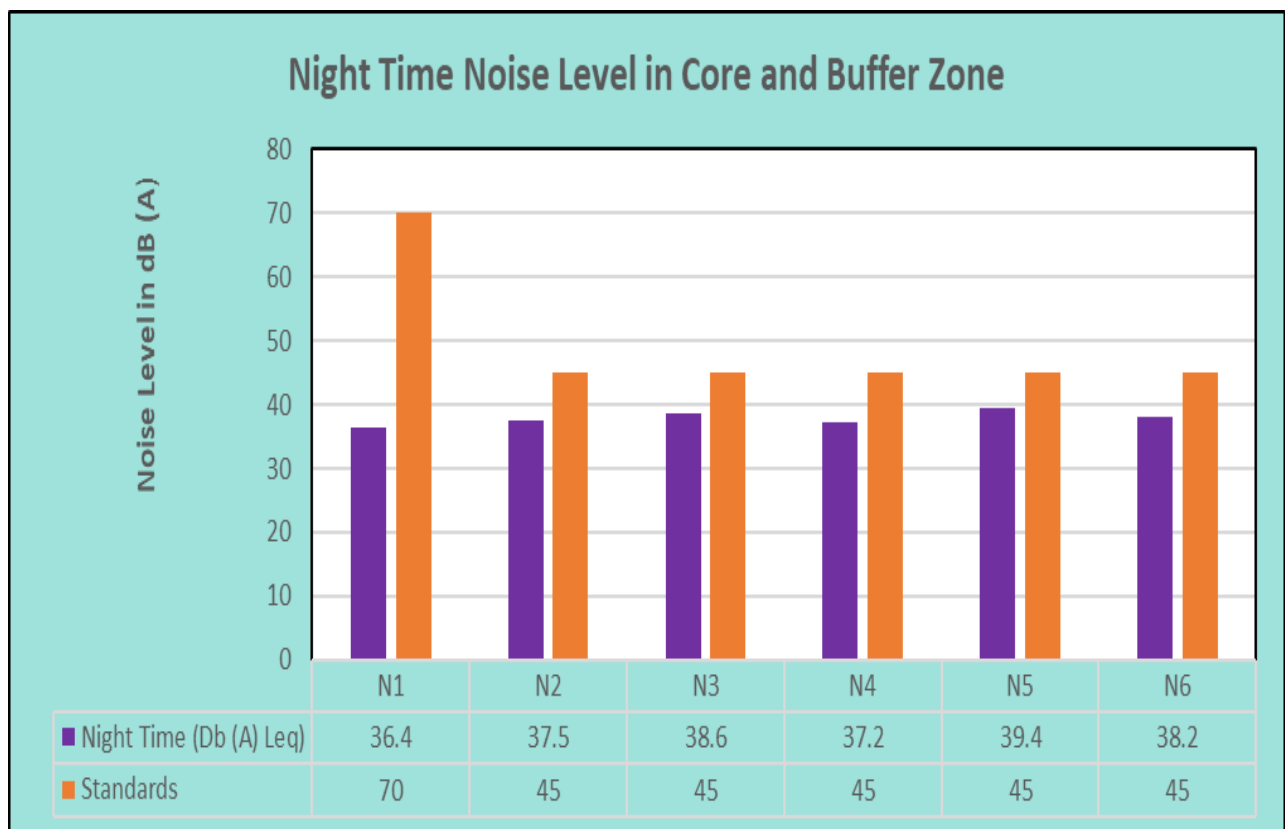
| Location       | Environmental setting | Average day noise level(dB(A)) | Average night noise level (dB(A)) | Day time (6.00 AM – 10.00 PM) | Night time (10.00 PM – 6.00 AM) |
|----------------|-----------------------|--------------------------------|-----------------------------------|-------------------------------|---------------------------------|
|                |                       |                                |                                   | Standard (Leq in dB(A))       |                                 |
| Near Core      | Industrial area       | 49.7                           | 36.4                              | 75                            | 70                              |
| Thottikuppam   | Residential area      | 45.1                           | 37.5                              | 55                            | 45                              |
| Jayanachandram |                       | 42.5                           | 38.6                              | 55                            | 45                              |
| Bikkanapally   |                       | 39.0                           | 37.2                              | 55                            | 45                              |
| Giriyanaipalli |                       | 41.6                           | 39.4                              | 55                            | 45                              |
| Santhanapalli  |                       | 40.2                           | 38.2                              | 55                            | 45                              |

Source: Sampling Results by **Greenlink Analytical and Research Laboratory (India) Private Ltd**, in association with GTMS

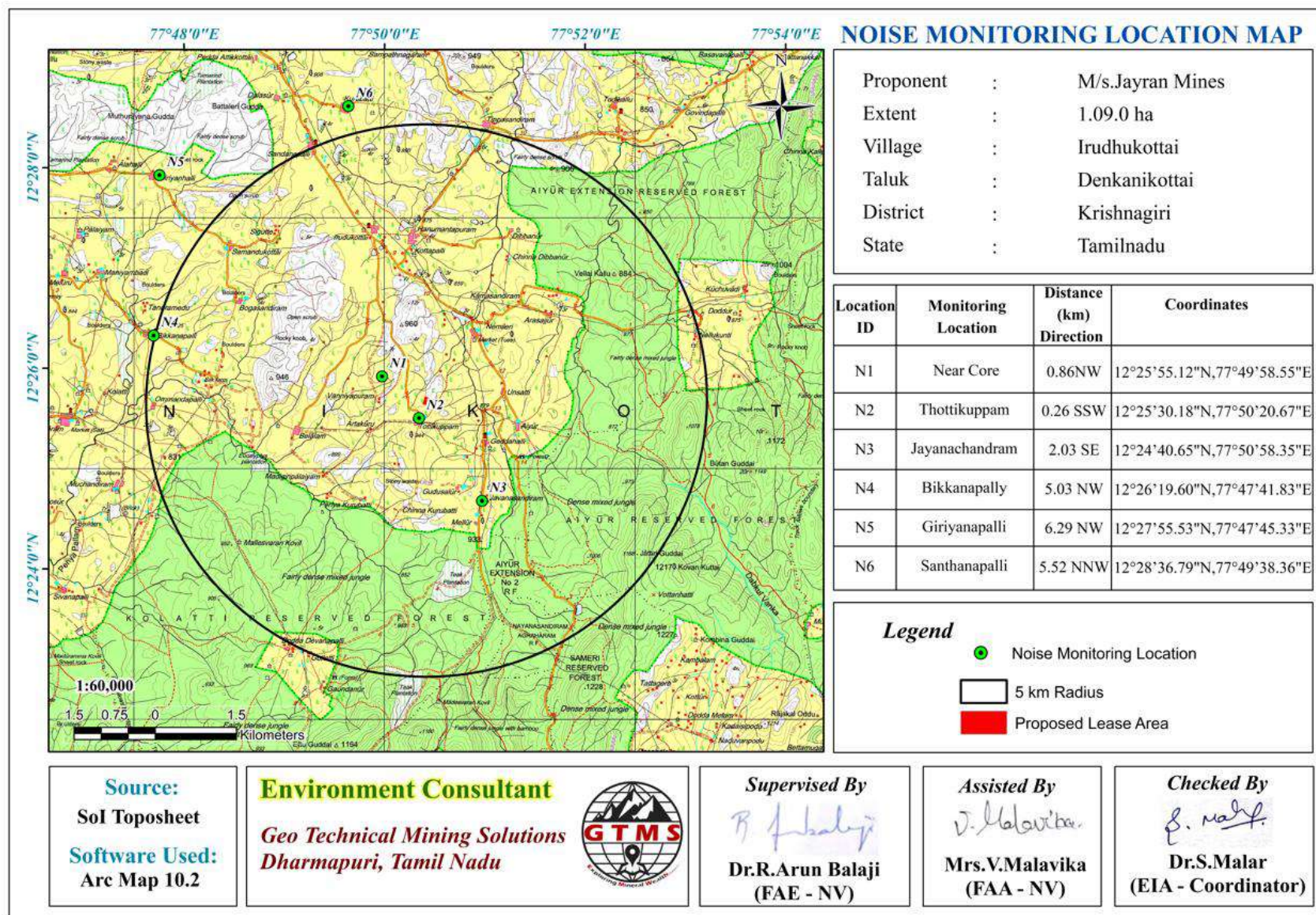
The Table 3.18 shows that noise level in core zone was 49.7dB (A) Leq during day time and 36.4dB (A) Leq during night time. Noise levels recorded in buffer zone during day time varied from 39.0 to 45.1 dB (A) Leq and during night time from 37.5 to 39.4 dB (A) Leq. Thus, the noise level for industrial and residential area meets the requirements of CPCB. The results are also depicted below in Figures 3.21 and 3.22.



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



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



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

### **3.6 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.

#### **3.6.1 Flora**

##### **3.6.1.1 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.

##### **3.6.1.2 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).



**Figure 3.24 Quadrates Sampling Methods of Flora**

#### **3.6.1.3 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.

#### **3.6.1.4 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

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

**Relative Value Index (RVI) = Relative Density +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.

### 3.6.1.5 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 the quarry lease area, only shrubs, herbs and grasses. Taxonomically total of 28 species belonging to 16 families were recorded. Among them are herbs (23) and shrubs (5). Majority of the species belongs to the family of Fabaceae and Poaceae. The species richness (Margalef index) and plant details are given in Table 3.19- 3.21. There are no endangered or threatened plant species in the quarry lease area.

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

The vegetation habit analysis indicates that the flora of the 300m radius of the study area consists of 60 species belonging to 31 families. Among the 60 species, 22 herbs, 24 shrubs and 14 trees. the highest number of species were from the Poaceae family (7), followed by Fabaceae (6), Malvaceae (4), and Mimosaceae (4). Three species were recorded from the Amaranthaceae, Apocynaceae, and Asteraceae families, while two species each were recorded from the Arecaceae, Boraginaceae, Convolvulaceae, Cucurbitaceae, Euphorbiaceae, and Lamiaceae families. The endangered or threatened and Species Richness (margalef Index) in the study area it mentioned in Table 3.19 - 3.21. The Velamundi Reserve Forest is located 172 meters north of the quarry lease area. The reserve forest is predominantly populated with *Albizia amara*, *Vachellia leucophloea*, *Vachellia karroo*, *Chloroxylon swietenia*, and *Ziziphus mauritiana*.

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

The 10km radius A total of 107 species of invasive alien species belonging to 82 genera and 39 families were recorded in 10km radius Table 3.22. Herbs (73.83%) formed the predominant life form followed by shrubs (10.28%), climbers (8.41%), trees (4.67%) and grasses (2.80%).



Table 3.19 Flora in 300meter 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                                  | Velikathan maram | <i>Prosopis juliflora</i>      | Fabaceae      | 3                    | 2                               | 5                      | 0.6     | 40.0          | 1.5       | 7.5              | 6.7                | 14.2 | Not Listed               |
| 2                                  | Pongam oiltree   | <i>Pongamia pin nata</i>       | Fabaceae      | 4                    | 3                               | 5                      | 0.8     | 60.0          | 1.3       | 10.0             | 10.0               | 20.0 | Not Listed               |
| 3                                  | Panai maram      | <i>Borassus flabellifer</i>    | Arecaceae     | 5                    | 4                               | 5                      | 1.0     | 80.0          | 1.3       | 12.5             | 13.3               | 25.8 | Not Listed               |
| 4                                  | Nochi            | <i>Vitex negundo</i>           | Lamiaceae     | 3                    | 2                               | 5                      | 0.6     | 40.0          | 1.5       | 7.5              | 6.7                | 14.2 | Not Listed               |
| 5                                  | Nuna maram       | <i>Morinda citrifolia</i>      | Rubiaceae     | 4                    | 3                               | 5                      | 0.8     | 60.0          | 1.3       | 10.0             | 10.0               | 20.0 | Not Listed               |
| 6                                  | Vembu            | <i>Azadirachta indica</i>      | Meliaceae     | 5                    | 4                               | 5                      | 1.0     | 80.0          | 1.3       | 12.5             | 13.3               | 25.8 | Not Listed               |
| 7                                  | Manga maram      | <i>Mangifera indica</i>        | Anacardiaceae | 4                    | 3                               | 5                      | 0.8     | 60.0          | 1.3       | 10.0             | 10.0               | 20.0 | Not Listed               |
| 8                                  | Thennai maram    | <i>Cocos nucifera</i>          | Arecaceae     | 3                    | 2                               | 5                      | 0.6     | 40.0          | 1.5       | 7.5              | 6.7                | 14.2 | Not Listed               |
| 9                                  | Wetpalai maram   | <i>Wrightia tinctoria</i>      | Apocynaceae   | 4                    | 3                               | 5                      | 0.8     | 60.0          | 1.3       | 10.0             | 10.0               | 20.0 | Not Listed               |
| 10                                 | Unjai maram      | <i>Albizia amara</i>           | Fabaceae      | 5                    | 4                               | 5                      | 1.0     | 80.0          | 1.3       | 12.5             | 13.3               | 25.8 | Not Listed               |
| <b>Shrubs</b>                      |                  |                                |               |                      |                                 |                        |         |               |           |                  |                    |      |                          |
| 1                                  | Unichedi         | <i>Lantana camara</i>          | Verbenaceae   | 7                    | 6                               | 10                     | 0.7     | 60.0          | 1.2       | 12.7             | 12.5               | 25.2 | Not Listed               |
| 2                                  | Sundaika         | <i>Solanum torvum</i>          | Solanaceae    | 9                    | 8                               | 10                     | 0.9     | 80.0          | 1.1       | 16.4             | 16.7               | 33.0 | Not Listed               |
| 3                                  | Erukku           | <i>Calotropis gigantea</i>     | apocynaceae   | 8                    | 7                               | 10                     | 0.8     | 70.0          | 1.1       | 14.5             | 14.6               | 29.1 | Not Listed               |
| 4                                  | Avarai           | <i>Senna auriculata</i>        | Fabaceae      | 10                   | 9                               | 10                     | 1.0     | 90.0          | 1.1       | 18.2             | 18.8               | 36.9 | Not Listed               |
| 5                                  | Sappathikalli    | <i>Cereus pterogonus</i>       | Cactus        | 6                    | 5                               | 10                     | 0.6     | 50.0          | 1.2       | 10.9             | 10.4               | 21.3 | Not Listed               |
| 6                                  | Kattamanaku      | <i>Jatropha gossypifolia L</i> | Euphorbiaceae | 7                    | 6                               | 10                     | 0.7     | 60.0          | 1.2       | 12.7             | 12.5               | 25.2 | Not Listed               |
| 7                                  | Karunochi        | <i>Vitex negundo</i>           | Lamiaceae     | 8                    | 7                               | 10                     | 0.8     | 70.0          | 1.1       | 14.5             | 14.6               | 29.1 | Not Listed               |
| <b>Herbs, Climbers &amp; Grass</b> |                  |                                |               |                      |                                 |                        |         |               |           |                  |                    |      |                          |

|    |                  |                                           |                |    |    |    |     |      |     |     |     |      |            |
|----|------------------|-------------------------------------------|----------------|----|----|----|-----|------|-----|-----|-----|------|------------|
| 1  | Thumbai          | <i>Leucas aspera</i>                      | Lamiaceae      | 9  | 8  | 15 | 0.6 | 53.3 | 1.1 | 5.6 | 5.7 | 11.2 | Not Listed |
| 2  | Katang kathrikai | <i>Solanum virginianum</i>                | Solanaceae     | 7  | 6  | 15 | 0.5 | 40.0 | 1.2 | 4.3 | 4.3 | 8.6  | Not Listed |
| 3  | Arugampul        | <i>Cynodon dactylon</i>                   | Poaceae        | 11 | 10 | 15 | 0.7 | 66.7 | 1.1 | 6.8 | 7.1 | 13.9 | Not Listed |
| 4  | Poolai poondu    | <i>Aerva lanata</i>                       | Amaranthaceae  | 8  | 7  | 15 | 0.5 | 46.7 | 1.1 | 4.9 | 5.0 | 9.9  | Not Listed |
| 5  | Korai            | <i>Cyperus rotundus</i>                   | Cyperaceae     | 6  | 5  | 15 | 0.4 | 33.3 | 1.2 | 3.7 | 3.5 | 7.2  | Not Listed |
| 6  | Nerunji          | <i>Tribulus terrestris</i>                | Zygophyllales  | 7  | 6  | 15 | 0.5 | 40.0 | 1.2 | 4.3 | 4.3 | 8.6  | Not Listed |
| 7  | Nayuruvi         | <i>Achyranthes aspera</i>                 | Amaranthaceae  | 8  | 7  | 15 | 0.5 | 46.7 | 1.1 | 4.9 | 5.0 | 9.9  | Not Listed |
| 8  | Thottalchinungi  | <i>Mimosa pudica</i>                      | Mimosaceae     | 9  | 8  | 15 | 0.6 | 53.3 | 1.1 | 5.6 | 5.7 | 11.2 | Not Listed |
| 9  | Anachundaikai    | <i>Solanum violaceum</i><br><i>Ortega</i> | Solanaceae     | 6  | 5  | 15 | 0.4 | 33.3 | 1.2 | 3.7 | 3.5 | 7.2  | Not Listed |
| 10 | Kombumul         | <i>Acanthospermum</i><br><i>hispidum</i>  | Asteraceae     | 7  | 6  | 15 | 0.5 | 40.0 | 1.2 | 4.3 | 4.3 | 8.6  | Not Listed |
| 11 | Ponnangani       | <i>Alternanthera pungens</i>              | Amaranthaceae  | 8  | 7  | 15 | 0.5 | 46.7 | 1.1 | 4.9 | 5.0 | 9.9  | Not Listed |
| 12 | wild thulasi     | <i>Hyptis suaveolens (L.)</i>             | Lamiaceae      | 10 | 9  | 15 | 0.7 | 60.0 | 1.1 | 6.2 | 6.4 | 12.6 | Not Listed |
| 13 | Gopuram Tangi    | <i>Andrographis echiioides</i>            | Acanthaceae    | 7  | 6  | 15 | 0.5 | 40.0 | 1.2 | 4.3 | 4.3 | 8.6  | Not Listed |
| 14 | Amman Paccharisi | <i>Euphorbia hirta</i>                    | Euphorbiaceae  | 8  | 7  | 15 | 0.5 | 46.7 | 1.1 | 4.9 | 5.0 | 9.9  | Not Listed |
| 15 | Paca poondu      | <i>Pavonia gallaensis</i>                 | Malvaceae      | 6  | 5  | 15 | 0.4 | 33.3 | 1.2 | 3.7 | 3.5 | 7.2  | Not Listed |
| 16 | Perandai         | <i>Cissus quadrangularis</i>              | Vitaceae       | 9  | 8  | 15 | 0.6 | 53.3 | 1.1 | 5.6 | 5.7 | 11.2 | Not Listed |
| 17 | Vishnukrandai    | <i>Evolvulus alsinoides</i>               | Convolvulaceae | 7  | 6  | 15 | 0.5 | 40.0 | 1.2 | 4.3 | 4.3 | 8.6  | Not Listed |
| 18 | Musumusukkai     | <i>Mukia maderaspatana</i>                | Cucurbitaceae  | 8  | 7  | 15 | 0.5 | 46.7 | 1.1 | 4.9 | 5.0 | 9.9  | Not Listed |
| 19 | Sirupunaikkali   | <i>Passiflora foetida</i>                 | Passifloraceae | 6  | 5  | 15 | 0.4 | 33.3 | 1.2 | 3.7 | 3.5 | 7.2  | Not Listed |
| 20 | Nagathali        | <i>Opuntia dillenii</i>                   | Cactaceae      | 7  | 6  | 15 | 0.5 | 40.0 | 1.2 | 4.3 | 4.3 | 8.6  | Not Listed |
| 21 | Agave            | <i>Agave sisalana</i>                     | Asparagaceae   | 8  | 7  | 15 | 0.5 | 46.7 | 1.1 | 4.9 | 5.0 | 9.9  | Not Listed |

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

| S. No                                    | Common name      | Scientific name                 | No. of Species | Pi   | In (Pi) | Pi x in (Pi) |
|------------------------------------------|------------------|---------------------------------|----------------|------|---------|--------------|
| <b>Trees</b>                             |                  |                                 |                |      |         |              |
| 1                                        | Velikathan maram | <i>Prosopis juliflora</i>       | 3              | 0.08 | -2.59   | -0.19        |
| 2                                        | Pongam oiltree   | <i>Pongamia pin nata</i>        | 4              | 0.10 | -2.30   | -0.23        |
| 3                                        | Panai maram      | <i>Borassus flabellifer</i>     | 5              | 0.13 | -2.08   | -0.26        |
| 4                                        | Nochi            | <i>Vitex negundo</i>            | 3              | 0.08 | -2.59   | -0.19        |
| 5                                        | Nuna maram       | <i>Morinda citrifolia</i>       | 4              | 0.10 | -2.30   | -0.23        |
| 6                                        | Vembu            | <i>Azadirachta indica</i>       | 5              | 0.13 | -2.08   | -0.26        |
| 7                                        | Manga maram      | <i>Mangifera indica</i>         | 4              | 0.10 | -2.30   | -0.23        |
| 8                                        | Thennai maram    | <i>Cocos nucifera</i>           | 3              | 0.08 | -2.59   | -0.19        |
| 9                                        | Wetpalai maram   | <i>Wrightia tinctoria</i>       | 4              | 0.10 | -2.30   | -0.23        |
| 10                                       | Unjai maram      | <i>Albizia amara</i>            | 5              | 0.13 | -2.08   | -0.26        |
| <b>H (Shannon Diversity Index) =2.28</b> |                  |                                 |                |      |         |              |
| <b>Shrubs</b>                            |                  |                                 |                |      |         |              |
| 1                                        | Unichedi         | <i>Lantana camara</i>           | 7              | 0.13 | -2.06   | -0.26        |
| 2                                        | Sundaika         | <i>Solanum torvum</i>           | 9              | 0.16 | -1.81   | -0.30        |
| 3                                        | Erukku           | <i>Calotropis gigantea</i>      | 8              | 0.15 | -1.93   | -0.28        |
| 4                                        | Avarai           | <i>Senna auriculata</i>         | 10             | 0.18 | -1.70   | -0.31        |
| 5                                        | Sappathikalli    | <i>Cereus pterogonus</i>        | 6              | 0.11 | -2.22   | -0.24        |
| 6                                        | Kattamanaku      | <i>Jatropha gossypifolia L</i>  | 7              | 0.13 | -2.06   | -0.26        |
| 7                                        | Karunochi        | <i>Vitex negundo</i>            | 8              | 0.15 | -1.93   | -0.28        |
| <b>H (Shannon Diversity Index) =1.93</b> |                  |                                 |                |      |         |              |
| <b>Herbs</b>                             |                  |                                 |                |      |         |              |
| 1                                        | Thumbai          | <i>Leucas aspera</i>            | 9              | 0.06 | -2.89   | -0.16        |
| 2                                        | Katang kathrikai | <i>Solanum virginianum</i>      | 7              | 0.04 | -3.14   | -0.14        |
| 3                                        | Arugampul        | <i>Cynodon dactylon</i>         | 11             | 0.07 | -2.69   | -0.18        |
| 4                                        | Poolai poondu    | <i>Aerva lanata</i>             | 8              | 0.05 | -3.01   | -0.15        |
| 5                                        | Korai            | <i>Cyperus rotundus</i>         | 6              | 0.04 | -3.30   | -0.12        |
| 6                                        | Nerunji          | <i>Tribulus terrestris</i>      | 7              | 0.04 | -3.14   | -0.14        |
| 7                                        | Nayuruvi         | <i>Achyranthes aspera</i>       | 8              | 0.05 | -3.01   | -0.15        |
| 8                                        | Thottalchinungi  | <i>Mimosa pudica</i>            | 9              | 0.06 | -2.89   | -0.16        |
| 9                                        | Anachundaikai    | <i>Solanum violaceum Ortega</i> | 6              | 0.04 | -3.30   | -0.12        |
| 10                                       | Kombumul         | <i>Acanthospermum hispidum</i>  | 7              | 0.04 | -3.14   | -0.14        |
| 11                                       | Ponnangani       | <i>Alternanthera pungens</i>    | 8              | 0.05 | -3.01   | -0.15        |
| 12                                       | Wild thulasi     | <i>Hyptis suaveolens (L.)</i>   | 10             | 0.06 | -2.79   | -0.17        |
| 13                                       | Gopuram Tangi    | <i>Andrographis echinoides</i>  | 7              | 0.04 | -3.14   | -0.14        |
| 14                                       | Amman Paccharisi | <i>Euphorbia hirta</i>          | 8              | 0.05 | -3.01   | -0.15        |
| 15                                       | Paca poondu      | <i>Pavonia gallaensis</i>       | 6              | 0.04 | -3.30   | -0.12        |
| 16                                       | Perandai         | <i>Cissus quadrangularis</i>    | 9              | 0.06 | -2.89   | -0.16        |
| 17                                       | Vishnukrandai    | <i>Evolvulus alsinoides</i>     | 7              | 0.04 | -3.14   | -0.14        |
| 18                                       | Musumusukkai     | <i>Mukia maderaspatana</i>      | 8              | 0.05 | -3.01   | -0.15        |

|                                          |                |                           |   |      |       |       |
|------------------------------------------|----------------|---------------------------|---|------|-------|-------|
| 19                                       | Sirupunaikkali | <i>Passiflora foetida</i> | 6 | 0.04 | -3.30 | -0.12 |
| 20                                       | Nagathali      | <i>Opuntia dillenii</i>   | 7 | 0.04 | -3.14 | -0.14 |
| 21                                       | Agave          | <i>Agave sisalana</i>     | 8 | 0.05 | -3.01 | -0.15 |
| <b>H (Shannon Diversity Index) =3.03</b> |                |                           |   |      |       |       |

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

| Details | H    | H max | Evenness | Species Richness |
|---------|------|-------|----------|------------------|
| Trees   | 2.28 | 2.30  | 0.99     | 2.44             |
| Shrubs  | 1.93 | 1.95  | 0.99     | 1.50             |
| Herbs   | 3.03 | 3.04  | 1.00     | 3.93             |

**Table 3.22 Flora in Buffer Zone**

| S. No        | Local Name       | Scientific name                 | Family name    |
|--------------|------------------|---------------------------------|----------------|
| <b>Trees</b> |                  |                                 |                |
| 1            | Vembu            | <i>Azadirachta indica</i>       | Meliaceae      |
| 2            | Pongam oiltree   | <i>Pongamia pinnata</i>         | Fabaceae       |
| 3            | Karuvelam        | <i>Acacia nilotica</i>          | Mimosaceae     |
| 4            | Thennai maram    | <i>Cocos nucifera</i>           | Arecaceae      |
| 5            | Arasanmaram      | <i>Ficus religiosa</i>          | Moraceae       |
| 6            | Puliyamaram      | <i>Tamarindus indica</i>        | Legumes        |
| 7            | Punnai           | <i>Calophyllum inophyllum</i>   | Calophyllaceae |
| 8            | Athi             | <i>Ficus recemosa</i>           | Moraceae       |
| 9            | Vazhaimaram      | <i>Musa</i>                     | Musaceae       |
| 10           | Kadukka puli     | <i>Terminalia chebula</i>       | Combretaceae   |
| 11           | Nettilinkam      | <i>Polylathia longifolia</i>    | Annonaceae     |
| 12           | Perumungil       | <i>Bambusa bambos</i>           | Poaceae        |
| 13           | Sapota           | <i>Manilkara zapota</i>         | Sapotaceae     |
| 14           | Eucalyptus       | <i>Eucalyptus globules</i>      | Myrtaceae      |
| 15           | Navalmaram       | <i>Sygygium cumini</i>          | Myrtaceae      |
| 16           | Ezhumuchai maram | <i>Citrus lemon</i>             | Rutaceae       |
| 17           | Alamaram         | <i>Ficus benghalensis</i>       | Moraceae       |
| 18           | Panai maram      | <i>Borassus flabellifer</i>     | Arecaceae      |
| 19           | Manga            | <i>Mangifera indica</i>         | Anacardiaceae  |
| 20           | Thekku           | <i>Tectona grandis</i>          | Verbenaceae    |
| 21           | Nelli            | <i>Emblia officinalis</i>       | Phyllanthaceae |
| 22           | Nettilinkam      | <i>Polylathia longifolia</i>    | Annonaceae     |
| 23           | Vellai Karuvelam | <i>Vachellia nilotica</i>       | Fabaceae       |
| 24           | Palamaram        | <i>Artocarpus heterophyllus</i> | Moraceae       |
| 25           | Vadanarayani     | <i>Delonix elata</i>            | Fabaceae       |
| 26           | Marudaani        | <i>Lawsonia inermis</i>         | Lythraceae     |
| 27           | Pappali maram    | <i>Carica papaya L</i>          | Caricaceae     |
| 28           | Nuna maram       | <i>Morinda citrifolia</i>       | Rubiaceae      |
| 29           | Koyya            | <i>Psidium guajava</i>          | Myrtaceae      |

|                                                    |                 |                                  |                |
|----------------------------------------------------|-----------------|----------------------------------|----------------|
| 30                                                 | Seethapazham    | <i>Annona reticulata</i>         | Annonaceae     |
| 31                                                 | Moonghil        | <i>Bambusa bambo</i>             | Poaceae        |
| <b>Shrubs</b>                                      |                 |                                  |                |
| 1                                                  | Avarai          | <i>Senna auriculata</i>          | Fabaceae       |
| 2                                                  | Sundaika        | <i>Solanum torvum</i>            | Solanaceae     |
| 3                                                  | Arali           | <i>Nerium indicum</i>            | Apocynaceae    |
| 4                                                  | Idlipoo         | <i>xoracoc cinea</i>             | Rubiaceae      |
| 5                                                  | Neermulli       | <i>Hydrophila auriculata</i>     | Acanthaceae    |
| 6                                                  | Icham           | <i>Phoenix pusilla</i>           | Arecaceae      |
| 7                                                  | Chaturakalli    | <i>Euphorbia antiquorum</i>      | Euphorbiaceae  |
| 8                                                  | Kattamanakku    | <i>Jatropha curcas</i>           | Euphorbiaceae  |
| 9                                                  | Thuthi          | <i>Abutilon indicum</i>          | Meliaceae      |
| 10                                                 | Chemparuthi     | <i>Hibiscu rosa-sinensis</i>     | Malvaceae      |
| 11                                                 | Erukku          | <i>Calotropis gigantea</i>       | Apocynaceae    |
| <b>Herbs, Climber, Creeper, Grass &amp; Cactus</b> |                 |                                  |                |
| 1                                                  | Thumbai         | <i>Leucas aspera</i>             | Lamiaceae      |
| 2                                                  | Partiniyam      | <i>Parthenium</i>                | Asteraceae     |
| 3                                                  | Thoiya keerai   | <i>Digeria muricata</i>          | Amaranthaceae  |
| 4                                                  | Pulliyari       | <i>Oxalis corniculata</i>        | Oxalidaceae    |
| 5                                                  | Mukurathai      | <i>Boerhavia diffusa</i>         | Nyctaginaceae  |
| 6                                                  | Thulasi         | <i>Ocimum tenuiflorum</i>        | Lamiaceae      |
| 7                                                  | Arugampul       | <i>Cynodon dactylon</i>          | Poaceae        |
| 8                                                  | Manjal          | <i>Curcuma longa</i>             | Zingiberaceae  |
| 9                                                  | Manathakkali    | <i>Solanumnigrum</i>             | Solanaceae     |
| 10                                                 | Nai kadugu      | <i>Celome viscosa</i>            | Capparidaceae  |
| 11                                                 | Koraikkilangu   | <i>Cyperus articulates</i>       | Cyperaceae     |
| 12                                                 | Karisilanganni  | <i>Eclipta prostata</i>          | Asteraceae     |
| 13                                                 | Korai           | <i>Cyperus rotundus</i>          | Cyperaceae     |
| 14                                                 | Kunnakora       | <i>Cyperus compressus</i>        | Cyperaceae     |
| 15                                                 | Mukurattai      | <i>Boerhavia diffusa</i>         | Nyctaginaceae  |
| 16                                                 | Kovai           | <i>Coccinia grandis</i>          | Cucurbitaceae  |
| 17                                                 | Perandai        | <i>Cissus quadrangularis</i>     | Vitaceae       |
| 18                                                 | Mudakkotan      | <i>Cardiospermum helicacabum</i> | Sapindaceae    |
| 19                                                 | Sangupoo        | <i>Clitoriaternatia</i>          | Fabaceae       |
| 20                                                 | Malli           | <i>Jasminum augustifolium</i>    | Oleaceae       |
| 21                                                 | Vallikeerai     | <i>Ipomoea aquatica</i>          | Convolvulaceae |
| 22                                                 | Siru puladi     | <i>Desmodium triflorum</i>       | Fabaceae       |
| 23                                                 | Sithrapaalavi   | <i>Euphorbia prostrata</i>       | Euphorbiaceae  |
| 24                                                 | mookuthi poondu | <i>Wedelia trilobata</i>         | Asteraceae     |
| 25                                                 | Pullu           | <i>Eragrostis ferruginea</i>     | Poaceae        |
| 26                                                 | Chevvarakupul   | <i>Chloris barbata</i>           | Amaranthaceae  |
| 27                                                 | Nagathali       | <i>Opuntia dillenii</i>          | Nagathali      |

|    |                 |                               |                |
|----|-----------------|-------------------------------|----------------|
| 28 | Nayuruvi        | <i>Achyranthes aspera</i>     | Amaranthaceae  |
| 29 | Veetukaayapoonu | <i>Tridax procumbens</i>      | Asteraceae     |
| 30 | Kaattu piral    | <i>Hibiscus hispidissimus</i> | Malvaceae      |
| 31 | Kuppaimeni      | <i>Acalypha indica</i>        | Euphorbiaceae  |
| 32 | Karisilanganni  | <i>Eclipta prostrata</i>      | Asteraceae     |
| 33 | Korai           | <i>Cyperus rotundus</i>       | Cyperaceae     |
| 34 | Kumattikkirai   | <i>Allmania nodiflora</i>     | Amaranthaceae  |
| 35 | Kunnakora       | <i>Cyperus compressus</i>     | Cyperaceae     |
| 36 | Keelaneeli      | <i>Phyllanthus niruri</i>     | Phyllanthaceae |
| 37 | Kanamvazhalai   | <i>Commelina benghalensis</i> | Commelinaceae  |
| 38 | Thottalchinungi | <i>Mimosa pudica</i>          | Mimosaceae     |

### 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 3.23.

**Table 3.23 Aquatic Vegetation**

| S.No.                | Scientific name                | Common Name         | IUCN Red List Status |
|----------------------|--------------------------------|---------------------|----------------------|
| 1                    | <i>Eichornia crassipes</i>     | Water hyacinth      | NA                   |
| 2                    | <i>Aponogeton natans</i>       | Floating lace plant | NA                   |
| 3                    | <i>Carex cruciata</i>          | Cross Grass         | NA                   |
| 4                    | <i>Cynodon dactylon</i>        | Scutch grass        | LC                   |
| <b>Aquatic fauna</b> |                                |                     |                      |
| 5                    | <i>Oreochromis mossambicus</i> | Jalebi              | VU                   |
| 6                    | <i>Labeo catla</i>             | Catla catla         | LC                   |
| 7                    | <i>Channa striata</i>          | Korava meen         | LC                   |

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

### 3.6.2 Fauna

The fauna study was both direct & indirect observation methods were used to survey the fauna, the study area was restricted up to 10km radius from the lease area. The study area is divided into two parts as core zone and buffer zone. The data was generated with reference to topography, land use, vegetation pattern, animals etc. Core zone has been considered within the cluster area and buffer zone has been considered outside the cluster area up to 10 km from Project boundary. The faunal like was carried out for Mammals, Birds, Reptiles, Amphibians and Butterflies. There are no rare, endangered, threatened (RET) and endemic species present in core area. indirect evidence such as calls, nests, burrows, droppings, scats, tracks etc. All available types of habitats at the site were evaluated and marked.

**Table 3.24 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);<br>Ali S (1941) |

### 3.6.2.1 Methodology

Field observations of fauna were carried out. The commonly available mammals, amphibians, reptiles, butterflies, with 10km surroundings were enumerated. The method followed for avifauna survey has been outlined in respective section. To prepare a detailed report on the status of faunal diversity within study area, field studies were conducted. Both direct (sighting) and indirect (evidences) observations methods were used to survey the faunal species around the study area. Further, information towards faunal diversity from secondary sources was collected on interaction with the local people and Forest Dept. officials.

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

The faunal species observed in the study area are listed in Table 3.25. A total of 26 species were recorded in core zone of the project area. The core zone exhibited fewer species, with only a small number of insects, mammals, and reptiles, whereas the buffer zone showed greater species diversity. Among the 26 species recorded, the distribution was as follows: (10) insects, (03) reptiles, Avian and (04) mammals. These species were cross-checked against the IUCN Red List Database version 3.1 to identify any threatened species. Data analysis revealed that 21 species are categorized as Least Concern on the Red List, while 18 species were not listed. The analysis indicates that there are no REET species in the core zone of the proposed quarry site.

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

The faunal species observed in the study area are listed in Table 3.26. Taxonomically a total of 82 species belonging to 49 families have been recorded from the buffer zone area. Based on habitat classification the majority of species were Birds 50, followed by Insects 13, Reptiles 11, Mammals 5 and amphibians 3. There are 4 schedule II species and 28 schedule IV species according to Indian wild life Act 1972. Totally, 19 species of bird were sighted in the study area.

**Table 3.25 Fauna in Core Zone**

| S.no           | Common Name/English Name | Scientific Name         | Family name  | IUCN Red List data |
|----------------|--------------------------|-------------------------|--------------|--------------------|
| <b>Insects</b> |                          |                         |              |                    |
| 1              | Chocolate pansy          | <i>Junonia iphita</i>   | Nymphalidae  | NA                 |
| 2              | Lime swallowtail         | <i>Papilio demoleus</i> | Papilionidae | NA                 |
| 3              | Common Mormon            | <i>Papilio polytes</i>  | Papilionidae | NA                 |

|                 |                            |                                  |                   |    |
|-----------------|----------------------------|----------------------------------|-------------------|----|
| 4               | Crimson dropwing           | <i>Trithemis aurora</i>          | Libellulidae      | LC |
| 5               | Lemon pansy                | <i>Junonia lemonias</i>          | Nymphalidae       | NA |
| 6               | Tawny coster               | <i>Acraea terpsicore</i>         | Nymphalidae       | NA |
| 7               | Slender skimmer            | <i>Orthetrum sabina</i>          | Libellulidae      | LC |
| 8               | Plains tiger butterfly     | <i>Danaus chrysippus</i>         | Nymphalidae       | LC |
| 9               | Mottled emigrant           | <i>Catopsilia pyranthe</i>       | Pieridae          | LC |
| 10              | Spotted locust             | <i>Aularches miliaris</i>        | Pyrgomorphidae    | LC |
| <b>Reptiles</b> |                            |                                  |                   |    |
| 1               | Oriental garden lizard     | <i>Calotes versicolor</i>        | Agamidae          | LC |
| 2               | Fan-Throated Lizard        | <i>Sitanaponticeriana</i>        | Agamidae          | LC |
| 3               | Common skink               | <i>Mabuya carinatus</i>          | Scincidae         | LC |
| <b>Aves</b>     |                            |                                  |                   |    |
| 1               | Baya weaver                | <i>Ploceus philippinus</i>       | Ploceidae         | LC |
| 2               | White – browed Wagtail     | <i>Motacilla maderaspatensis</i> | Motacillidae      | LC |
| 3               | Great cormorant            | <i>Phalacrocorax carbo</i>       | Phalacrocoracidae | LC |
| 4               | Indian robin               | <i>Copsychus fulicatus</i>       | Muscicapidae      | LC |
| 5               | Indian Roller              | <i>Coracias benghalensis</i>     | Coraciidae        | LC |
| 6               | Indian paradise flycatcher | <i>Terpsiphone paradisi</i>      | Monarchidae       | LC |
| 7               | Common myna                | <i>Acridotheres tristis</i>      | Sturnidae         | LC |
| 8               | European bee- eater        | <i>Merops apiaster</i>           | Meropidae         | LC |
| 9               | Black drongo               | <i>Dicrurus macrocercus</i>      | Dicruridae        | LC |
| <b>Mammals</b>  |                            |                                  |                   |    |
| 1               | House mouse                | <i>Mus musculus</i>              | Muridae           | LC |
| 2               | Indian hare                | <i>Lepus nigricollis</i>         | Leporidae         | LC |
| 3               | Cow                        | <i>Bos taurus</i>                | Bovidae           | NA |
| 4               | Goat                       | <i>Capra hircus</i>              | Bovidae           | NA |

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

**Table 3.26 Fauna in Buffer Zone**

| S. No          | Common Name/English Name | Scientific Name         | Family name  | IUCN Red List data |
|----------------|--------------------------|-------------------------|--------------|--------------------|
| <b>Insects</b> |                          |                         |              |                    |
| 1              | Chocolate pansy          | <i>Junonia iphita</i>   | Nymphalidae  | NA                 |
| 2              | Lime swallowtail         | <i>Papilio demoleus</i> | Papilionidae | NA                 |
| 3              | Common Mormon            | <i>Papilio polytes</i>  | Papilionidae | NA                 |
| 4              | Crimson dropwing         | <i>Trithemis aurora</i> | Libellulidae | LC                 |
| 5              | Lemon pansy              | <i>Junonia lemonias</i> | Libellulidae | NA                 |



|                 |                              |                                  |                   |    |
|-----------------|------------------------------|----------------------------------|-------------------|----|
| 6               | Tawny coster                 | <i>Acraea terpsicore</i>         | Nymphalidae       | NA |
| 7               | Slender skimmer              | <i>Orthetrum sabina</i>          | Libellulidae      | LC |
| 8               | Plaina tiger butterfly       | <i>Danaus chrysippus</i>         | Nymphalidae       | LC |
| 9               | Danaid eggfly                | <i>Hypolimnas misippus</i>       | Nymphalidae       | LC |
| 10              | Bark blue tiger butterfly    | <i>Tirumala septentrionis</i>    | Nymphalidae       | NA |
| 11              | Mottled emigrant             | <i>Catopsilia pyranthe</i>       | Pieridae          | NA |
| 12              | Spotted locust               | <i>Aularches miliaris</i>        | Pyrgomorphidae    | NA |
| 13              | Ditgh jewel                  | <i>Brachythemis contaminata</i>  | Libellulidae      | LC |
| <b>Reptiles</b> |                              |                                  |                   |    |
| 1               | Oriental garden lizard       | <i>Calotes uersicolor</i>        | Agamidae          | NA |
| 2               | Fan-Throated Lizard          | <i>Sitanaponticeriana</i>        | Agamidae          | NA |
| 3               | Common skink                 | <i>Mabuya carinatus</i>          | Scincidae         | NA |
| 4               | Buff striped keelback        | <i>Amphiesma stolatum</i>        | Colubridae        | LC |
| 5               | Common bronzeback tree snake | <i>Dendrelaphis tristis</i>      | Colubridae        | LC |
| 6               | Common krait                 | <i>Bungarus caeruleus</i>        | Elapidae          | LC |
| 7               | Russells wolf snake          | <i>Lycodon fasilatus</i>         | Colubridae        | LC |
| 8               | Brahminy blindsnake          | <i>Indotyphlope braminus</i>     | Typhlopidae       | LC |
| 9               | Rock dragon                  | <i>Psammophilus dorsalis</i>     | Agamidae          | LC |
| 10              | Indian vine snake            | <i>Ahaetulla oxyrhynca</i>       | Colubridae        | NA |
| 11              | Blotched house gecko         | <i>Hemidactylus triedrus</i>     | Gekkonidae        | LC |
| <b>Aves</b>     |                              |                                  |                   |    |
| 1               | Baya weaver                  | <i>Ploceus philippinus</i>       | Ploceidae         | LC |
| 2               | White – browed Wagtail       | <i>Motacilla maderaspatensis</i> | Motacillidae      | LC |
| 3               | Great cormorant              | <i>Phalacrocorax carbo</i>       | Phalacrocoracidae | LC |
| 4               | Indian robin                 | <i>Copsychus fulicatus</i>       | Muscicapidae      | LC |
| 5               | Indian Roller                | <i>Coracias benghalensis</i>     | Coraciidae        | LC |
| 6               | Indian paradise flycatcher   | <i>Terpsiphone paradisi</i>      | Monarchidae       | LC |
| 7               | Red junglefowl               | <i>Gallus gallus</i>             | Phasianidae       | LC |
| 8               | Common myna                  | <i>Acridotheres tristis</i>      | Sturnidae         | LC |
| 9               | European bee- eater          | <i>Merops apiaster</i>           | Meropidae         | LC |
| 10              | Black drongo                 | <i>Dicrurus macrocercus</i>      | Dicruridae        | LC |
| 11              | Black – winged stilt         | <i>Himantopus Himantopus</i>     | Recurvirostridae  | LC |
| 12              | Crested serpent eagle        | <i>Spilornis cheela</i>          | Accipitridae      | LC |
| 13              | Brahminy kite                | <i>Haliastur indus</i>           | Accipitridae      | LC |
| 14              | Spotted owlet                | <i>Athene brama</i>              | Strigidae         | LC |

|    |                             |                                |                |    |
|----|-----------------------------|--------------------------------|----------------|----|
| 15 | Black rumped flameback      | <i>Dinopium benghalense</i>    | Picidae        | LC |
| 16 | White -browed bulbul        | <i>Pycnonotus luteolus</i>     | Pycnonotidae   | LC |
| 17 | House sparrow               | <i>Passer domesticus</i>       | Passeridae     | LC |
| 18 | Grey heron                  | <i>Ardea cinerea</i>           | Ardeidae       | LC |
| 19 | Indian peafowl              | <i>Pavo cristatus</i>          | Phasianidae    | LC |
| 20 | Rose -ringed parakeet       | <i>Psittacula krameri</i>      | Psittaculidae  | LC |
| 21 | Scaly – breasted munia      | <i>Lonchura punctulata</i>     | Estrildidae    | LC |
| 22 | White -throated kingfisher  | <i>Halcyon smyrnensis</i>      | Alcedinidae    | LC |
| 23 | House crow                  | <i>Corvus splendens</i>        | Corvidae       | LC |
| 24 | Asian koel                  | <i>Eudynamys scolopaceus</i>   | Cuculidae      | LC |
| 25 | Asian green bee- Eater      | <i>Merops orientalis</i>       | Meropidae      | LC |
| 26 | Little cormorant            | <i>Microcarbo niger</i>        | Microcarbo     | LC |
| 27 | Painted stork               | <i>Mycteria leucocephala</i>   | Ciconiidae     | NT |
| 28 | Shikra                      | <i>Accipiter badius</i>        | Accipitridae   | LC |
| 29 | Indian robin                | <i>Copsychus fulicatus</i>     | Muscicapidae   | LC |
| 30 | Indian roller               | <i>Coracias benghalensis</i>   | Coraciidae     | LC |
| 31 | Indian paradise flycatcher  | <i>Terpsiphone paradisi</i>    | Monarchidae    | LC |
| 32 | Yellow – billed babbler     | <i>Argya affinis</i>           | Leiothrichidae | LC |
| 33 | Ashy – crowned sparrow lark | <i>Eremopterix griseus</i>     | Alaudidae      | LC |
| 34 | Small pratincole            | <i>Glareola lactea</i>         | Glareolidae    | LC |
| 35 | Great egret                 | <i>Ardea alba</i>              | Ardeidae       | LC |
| 36 | Rock pigeon                 | <i>Columba livia</i>           | Columbidae     | LC |
| 37 | Eurasian collared – dove    | <i>Streptopelia decaocto</i>   | Columbidae     | LC |
| 38 | Eurasian coot               | <i>Fulica atra</i>             | Rallidae       | LC |
| 39 | Northern shoveler           | <i>Spatula clypeata</i>        | Anatidae       | LC |
| 40 | Black kite                  | <i>Milvus migrans</i>          | Accipitridae   | LC |
| 41 | Red junglefowl              | <i>Gallus gallus</i>           | Phasianidae    | LC |
| 42 | Common kingfisher           | <i>Alcedo atthis</i>           | Alcedo atthis  | LC |
| 43 | Common sandpiper            | <i>Actitis hypoleucos</i>      | Scolopacidae   | LC |
| 44 | Striated heron              | <i>Butorides striata</i>       | Ardeidae       | LC |
| 45 | Laughing dove               | <i>Spilopelia senegalensis</i> | Columbidae     | LC |
| 46 | Red vented bulbul           | <i>Pycnonotus cafer</i>        | Pycnonotidae   | LC |
| 47 | Black winged kite           | <i>Elanus caeruleus</i>        | Accipitridae   | LC |
| 48 | Common tailorbird           | <i>Orthotomus sutorius</i>     | Cisticolidae   | LC |
| 49 | Indian pond -heron          | <i>Ardeola grayii</i>          | Ardeidae       | LC |

|                   |                              |                                   |                |    |
|-------------------|------------------------------|-----------------------------------|----------------|----|
| 50                | Greater racket tailed drongo | <i>Dicrurus paradiseus</i>        | Dicruridae     | LC |
| <b>Mammals</b>    |                              |                                   |                |    |
| 1                 | House mouse                  | <i>Mus musculus</i>               | Muridae        | LC |
| 2                 | Indian hare                  | <i>Lepus nigricollis</i>          | Leporidae      | LC |
| 3                 | Jungle cat                   | <i>Felis chaus</i>                | Felidae        | LC |
| 4                 | Cow                          | <i>Bos taurus</i>                 | Bovidae        | NA |
| 5                 | Goat                         | <i>Capra hircus</i>               | Bovidae        | NA |
| <b>Amphibians</b> |                              |                                   |                |    |
| 1                 | Asian common toad            | <i>Duttaphrynus melanostictus</i> | Bufonidae      | LC |
| 2                 | Chunam tree frog             | <i>Polypedates maculatus</i>      | Rhacophoridae  | LC |
| 3                 | Common skittering frog       | <i>Euphlycits cyanophlyctis</i>   | Dicroglossidae | LC |

### **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 3.27.

**Table 3.27 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. There are no biosphere reserves or wildlife sanctuaries or National parks or Important Bird Areas (IBAs), ecologically sensitive zone in 10km radius.

### **Agriculture & Horticulture in Krishnagiri district**

Krishnagiri district is one of the potential districts for cultivation of agricultural and horticultural crops. Total cultivated area of 224767 Hectares, out of which 180902Ha Net cultivated area against the 5,14,325Ha. of total geographical area. The total normal area cultivated under all crops is 224767 Hectares out of which 73046 Ha is under irrigated and 151720 ha area under rained crops. The major agricultural crops in the district are grown Paddy, Ragi, Redgram, Cowpea, Maize, Cumbu, Groundnut, Horsegram and minor millets. The major cultivated area of agricultural crops occupied by rained agriculture. The total number of 2,81,733 famers engaged in agriculture out of which 213023 are Marginal farmers (76%), 45970 are small farmers (16%), remaining 4615 farmers (8%) are medium and large farmers. Details of major field crops and horticulture within 1 km radius are given below.

#### ***Major Agricultural Crops***

Major horticulture crops cultivated in this district are fruit crops like mango, banana, Sapota and guava, vegetables like tomato, brinjal, chillies, onion and turmeric. Details of major field crops and horticulture in 1km radius is given in Table. 3.28. Agricultural land in the study area.

**Table 3.28 Major Crops in 1km radius**

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

#### ***Major Horticulture Crops***

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

## Horticulture

Major horticulture crops cultivated in this district are fruit crops like mango, banana, Sapota and guava, vegetables like tomato, brinjal, Ladies finger, chillies, onion and tapioca, spices like turmeric. Details of major field crops and horticulture cultivation in 1km radius is given in Table 3.29.

**Table 3.29 Major Field Crops & Horticulture cultivation in 1km radius.**

| SI.No                            | Common Name   | Scientific Name               | Family         |
|----------------------------------|---------------|-------------------------------|----------------|
| <b>Major Horticultural Crops</b> |               |                               |                |
| 1                                | Banana        | <i>Musa</i>                   | Musaceae       |
| 2                                | Mango         | <i>Mangifera indica</i>       | Anacardiaceae  |
| 4                                | Guava         | <i>Psidium guajava</i>        | Myrtaceae      |
| 5                                | Sapota        | <i>Manilkara zapota</i>       | Sapotaceae     |
| 6                                | Lemon         | <i>Citrus × limon</i>         | Rutaceae       |
| 7                                | Papaya        | <i>Carica papaya</i>          | Caricaceae     |
| <b>Vegetables</b>                |               |                               |                |
| 8                                | Onion         | <i>Allium cepa</i>            | Amaryllidaceae |
| 9                                | Tapioca       | <i>Manihot esculenta</i>      | Spurges        |
| 10                               | Brinjal       | <i>Solanum melongena</i>      | Nightshade     |
| 11                               | Tomato        | <i>Solanum lycopersicum</i>   | Nightshade     |
| 12                               | Bottle Gourd  | <i>Lagenaria siceraria</i>    | Cucurbits      |
| 13                               | Veandai kai   | <i>Abelmoschus esculentus</i> | Mallows        |
| 14                               | Moringa       | <i>Moringa oleifera</i>       | Moringaceae    |
| 15                               | Mullangi      | <i>Raphanus sativus</i>       | Brassicaceae   |
| <b>Flowers</b>                   |               |                               |                |
| 18                               | Jasmine       | <i>Jasminum</i>               | Jasminaceae    |
| 20                               | Sambanthi poo | <i>Crysanthimum</i>           | Asteraceae     |
| 21                               | Rose & Jathi  | <i>Rosa</i>                   | Rosaceae       |
| 23                               | Tuberose      | <i>Polianthes tuberosa</i>    | Asparagus      |
| <b>Spices and Condiments</b>     |               |                               |                |
| 24                               | Chillies      | <i>Capsicum frutescens</i>    | Solanaceae     |
| 25                               | Turmeric      | <i>Curcuma longa</i>          | Zingiberaceae  |
| 26                               | Curry leaf    | <i>Murraya koenigii</i>       | Rutaceae       |

## **Results**

The biodiversity assessment of the proposed project site has identified no ecologically sensitive areas within the core or buffer zones. The flora and fauna observed in the study area are commonly occurring species, with no IUCN-listed rare, endangered, endemic, or threatened (REET) species present, except for some species classified as of least concern. Additionally, the site is not located on any migratory routes for fauna. Operations at the stone and gravel quarry may generate dust particles. Implementing a green belt composed of native trees could help mitigate the dust effect on nearby flora and fauna. Key recommendations from the assessment include adopting green mining strategies to minimize environmental impact and developing a green belt with native trees to reduce dust movement from mining activities. This small mining operation over short period of time will not have any significant impact on the surrounding flora and fauna.

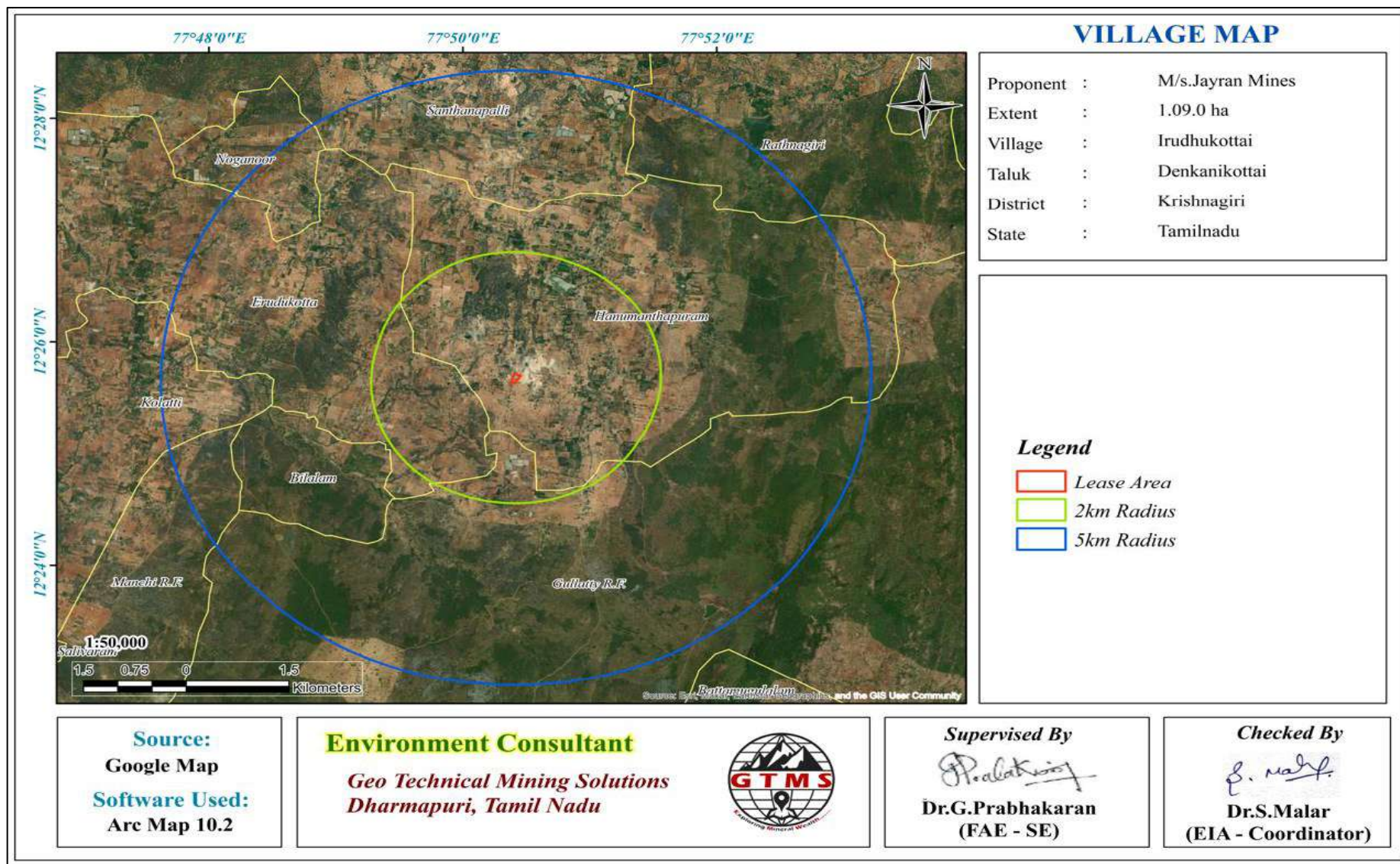
### **3.7 SOCIO ECONOMIC ENVIRONMENT**

The major developmental activities in mining/Industrial sector are required for economic development as well as creation of employment opportunities (direct and indirect) and to meet the basic/modern needs of the society, which ultimately results in overall improvement of the quality of life through upliftment of social, economic, health, education and nutritional status in the project region, state as well as the country. In this manner all developmental projects have direct as well as indirect relationships with socioeconomic aspects, which also include public acceptability for new developmental projects. Thus, the study of socioeconomic component incorporating various facets related to prevailing social and cultural conditions and economic status of the rough stone and granite quarry project region is an important part of 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

#### **3.7.1 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.



**Figure 3.25 Socio Economic Village Boundary Map**

### 3.7.2 Primary Data Collection

Primary data was collected through household survey, Focus Group Discussions (FGD) with key stakeholders and public consultations. The primary data collection and consultations were carried out with the objectives of:

- Assessing the socio-economic situation of the local people
- Creating public awareness about the project
- Assessing the views of local people about the project and understanding the needs of the community for possible incorporation into community development plans.

For the primary survey, the study area was divided into three zones depending upon the distance from the project site: the study area of three impact zones is given as Figure 3.25.

**Zone 1 (Core Zone):** 0-1km from the proposed project site

**Zone 2 (Low impact zone):** 1-5km from the proposed project site

### 3.7.3 Collection of Data from Secondary Sources

Data from secondary sources were collected on following aspects:

- Demographic profile of the area
- Economic profile of the area

**Table 3.30 Type of Information and Sources**

| Information                  | Source                                   |
|------------------------------|------------------------------------------|
| Demography                   | District Census Handbook, Govt. of India |
| Economic profile of the area | Census of India, Tamil Nadu State        |

### **Primary data of Socio-Economic Profile of the Study Area - Irudhukottai Village, Denkanikottai Taluk**

Irudhukottai is a large village located in Denkanikottai Taluka of Krishnagiri district, Tamil Nadu with total 1190 families residing. The Irudhukottai village has population of 5563 of which 2914 are males while 2649 are females as per Population Census 2011. In Irudhukottai village population of children with age 0-6 is 685 which makes up 12.31 % of total population of village. Average Sex Ratio of Irudhukottai village is 909 which is lower than Tamil Nadu state average of 996. Child Sex Ratio for the Irudhukottai as per census is 941, lower than Tamil Nadu average of 943.

Irudhukottai village has lower literacy rate compared to Tamil Nadu. In 2011, literacy rate of Irudhukottai village was 54.04 % compared to 80.09 % of Tamil Nadu. In Irudhukottai Male literacy stands at 61.34 % while female literacy rate was 45.96 %.



**Table. 3.31 Irudhukottai Village Population Facts**

| <b>Particulars</b>  | <b>Total</b> | <b>Male</b> | <b>Female</b> |
|---------------------|--------------|-------------|---------------|
| Total No. of Houses | 1190         | -           | -             |
| Population          | 5563         | 2914        | 2649          |
| Child (0-6)         | 685          | 353         | 332           |
| Schedule Caste      | 821          | 424         | 397           |
| Schedule Tribe      | 29           | 12          | 17            |
| Literacy %          | 54.04        | 61.34       | 45.96         |
| Total Workers       | 2862         | 1809        | 1053          |
| Main Worker         | 2242         | -           | -             |
| Marginal Worker     | 620          | 333         | 287           |

Source: <https://www.census2011.co.in/data/village/644076-erudukotta-tamil-nadu.html>

### **3.7.4 Working Population- Irudhukottai Village, Denkanikottai Taluk**

In Irudhukottai village out of total population, 2862 were engaged in work activities. 78.34 % of workers describe their work as Main Work (Employment or Earning more than 6 Months) while 21.66 % were involved in Marginal activity providing livelihood for less than 6 months. Of 2862 workers engaged in Main Work, 1556 were cultivators (owner or co-owner) while 328 were Agricultural labourer.

#### **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 settlements within a radius of 5 km from the project site along with population, their education level etc. are given in the table 3.33.

### **3.7.5 Krishnagiri District**

Krishnagiri district is bounded by Vellore and Thiruvannamalai districts in the East, Karnataka state in the west, State of Andhra Pradesh in the North Dharmapuri District in the south. Its area is 5143 Sq. Kms. The average rainfall is 830 mm per annum. Three languages namely Tamil, Telugu and Kannada are predominantly spoken in this district. Krishnagiri District has 2 Municipalities, 10 Panchayat Unions, 7 Town Panchayats, 352 Village Panchayats and 636 Revenue Villages. In 2011, Krishnagiri had population of 1,879,809 of which male and female were 960,232 and 919,577 respectively. In 2001 census, Krishnagiri had a population of 1,561,118 of which males were 803,077 and remaining 758,041 were females. Average literacy rate of Krishnagiri in 2011 were 71.46 compared to 71.46 of 2001. If things are looked out at gender wise, male and female literacy were 78.72 and 63.91 respectively. For 2001 census, same figures stood at 72.50 and 51.62 in Krishnagiri District.

Total literate in Krishnagiri District was 1,187,958 of which male and female were 667,062 and 520,896 respectively. In 2001, Krishnagiri District had 838,547 in its district.

With regards to Sex Ratio in Krishnagiri, it stood at 958 per 1000 male compared to 2001 census figure of 944. The average national sex ratio in India is 940 as per latest reports of Census 2011 Directorate. In 2011 census, child sex ratio is 926 girls per 1000 boys compared to figure of 869 girls per 1000 boys of 2001 census data. In census enumeration, data regarding child under 0-6 age were also collected for all districts including Krishnagiri. There was total 217,323 children under age of 0-6 against 214,954 of 2001 census. Of total 217,323 male and female were 112,832 and 104,491 respectively. Child Sex Ratio as per census 2011 was 926 compared to 869 of census 2001. In 2011, Children under 0-6 formed 11.56 percent of Krishnagiri District compared to 13.77 percent of 2001. There was net change of -2.21 percent in this compared to previous census of India.

Source: <https://www.census2011.co.in/data/town/803410-krishnagiri-tamil-nadu.html>







**Figure 3.26 Photographs of the Socio-Economic Survey**

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

| Village Name    | No. of Houses | Total Population |        | Child (0-6) |        | Schedule Caste |        | Schedule Tribe |        | Literacy |        | Total Workers |        |
|-----------------|---------------|------------------|--------|-------------|--------|----------------|--------|----------------|--------|----------|--------|---------------|--------|
|                 |               | Male             | Female | Male        | Female | Male           | Female | Male           | Female | Male     | Female | Male          | Female |
| Bilalam         | 154           | 414              | 360    | 56          | 49     | 3              | 3      | 0              | 0      | 174      | 82     | 223           | 200    |
| Irudukotta      | 1190          | 2914             | 2649   | 353         | 332    | 424            | 397    | 12             | 17     | 1571     | 1065   | 1809          | 1053   |
| Hanumanthapuram | 1125          | 2712             | 2529   | 366         | 339    | 328            | 324    | 373            | 366    | 1578     | 1089   | 1653          | 1330   |
| Kolatti         | 500           | 1118             | 1105   | 127         | 100    | 121            | 124    | 0              | 0      | 698      | 540    | 721           | 314    |
| Noganoor        | 692           | 1546             | 1438   | 169         | 150    | 227            | 197    | 10             | 9      | 968      | 727    | 938           | 724    |
| Rathnagiri      | 505           | 1221             | 1121   | 156         | 149    | 191            | 178    | 62             | 65     | 766      | 550    | 730           | 591    |
| Santhanapalli   | 1433          | 3417             | 3128   | 358         | 315    | 976            | 946    | 61             | 51     | 1974     | 1426   | 2158          | 1539   |
| Total           | 5599          | 13342            | 12330  | 1585        | 1434   | 2270           | 2169   | 518            | 508    | 7729     | 5479   | 8232          | 5751   |

Source: <https://www.census2011.co.in/data/town/krishnagiri-tamil-nadu.html>

**Table 3.33 Workers Profile of Study Area**

| Village         | Total Worker Population Person | Total Worker Population Male | Total Worker Population Female | Main Working Population Person | Main Cultivator Population Person | Main Agricultural Labourers Population Person | Main Other Workers Population Person | Non-Working Population Person |
|-----------------|--------------------------------|------------------------------|--------------------------------|--------------------------------|-----------------------------------|-----------------------------------------------|--------------------------------------|-------------------------------|
| Bilalam         | 423                            | 223                          | 200                            | 333                            | 184                               | 15                                            | 123                                  | 351                           |
| Irudukotta      | 2862                           | 1809                         | 1053                           | 2242                           | 1556                              | 328                                           | 318                                  | 2701                          |
| Hanumanthapuram | 2983                           | 1653                         | 1330                           | 2694                           | 1011                              | 1367                                          | 299                                  | 2258                          |
| Kolatti         | 1035                           | 721                          | 314                            | 960                            | 713                               | 18                                            | 214                                  | 1188                          |
| Noganoor        | 1662                           | 938                          | 724                            | 1533                           | 805                               | 343                                           | 357                                  | 1322                          |
| Rathnagiri      | 1321                           | 730                          | 591                            | 840                            | 584                               | 232                                           | 21                                   | 1021                          |
| Santhanapalli   | 3697                           | 2158                         | 1539                           | 3330                           | 1426                              | 1340                                          | 528                                  | 2848                          |

Source: <https://www.census2011.co.in/data/town/krishnagiri-tamil-nadu.html>



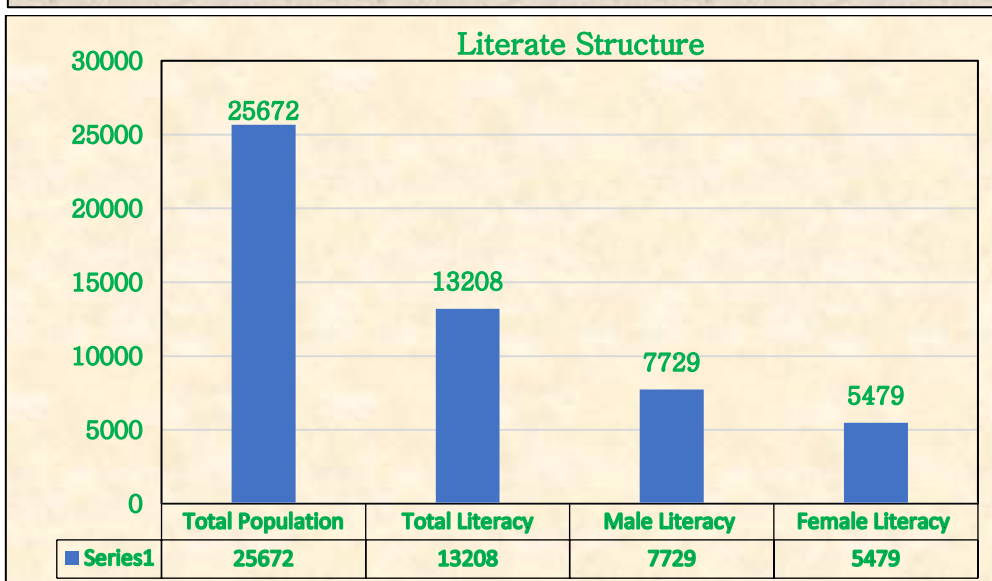
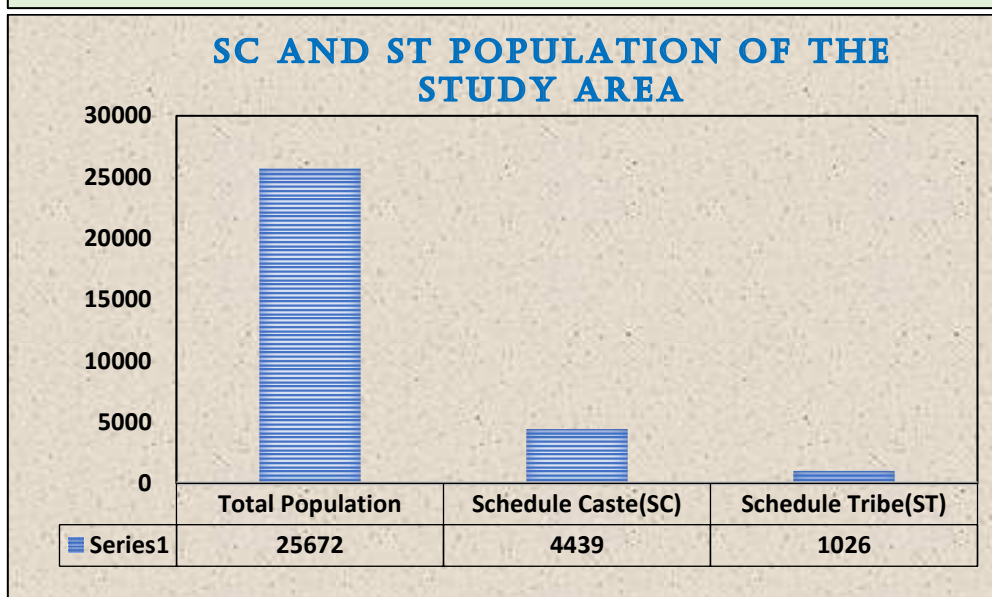
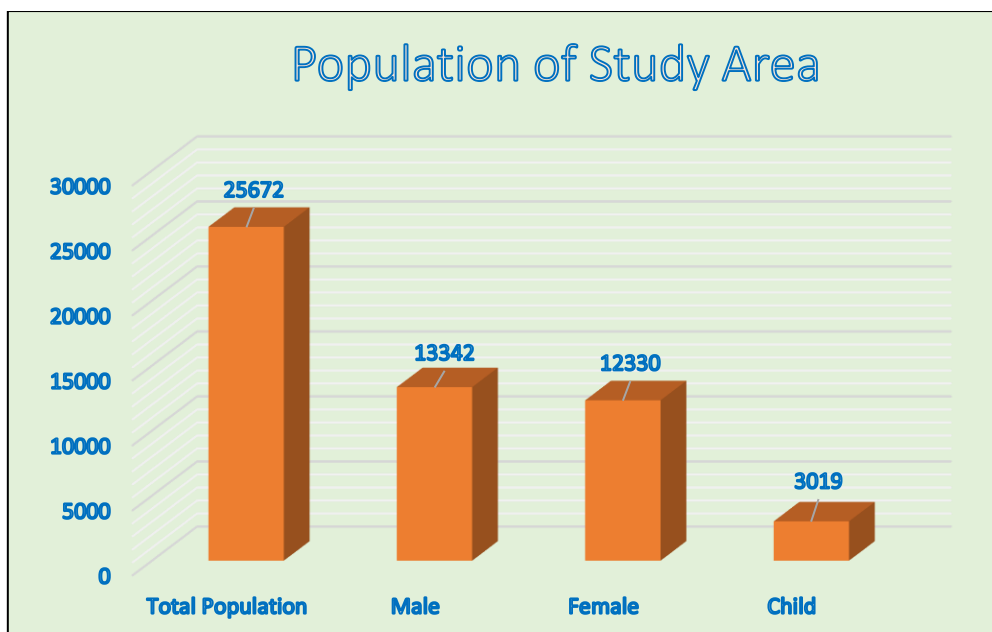
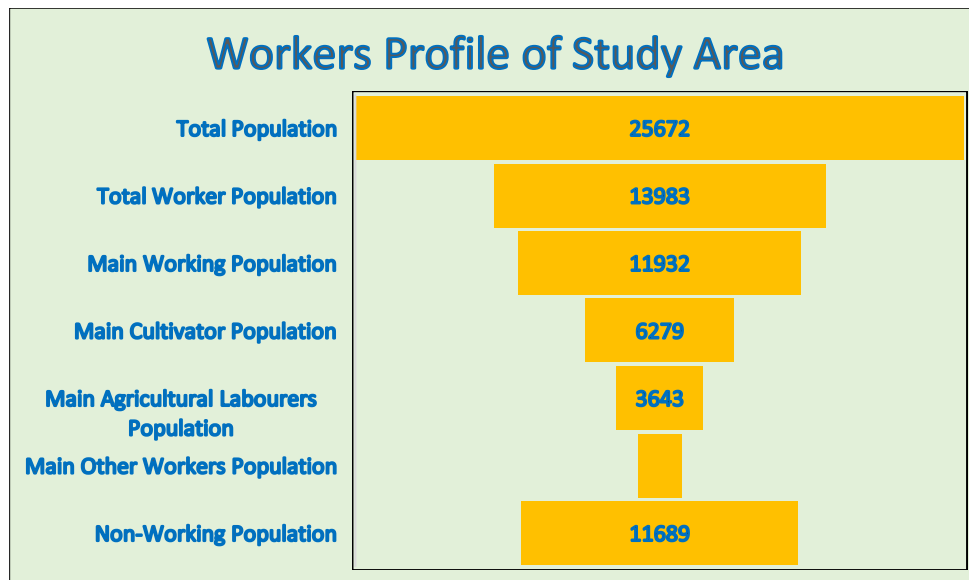


Figure 3.27 Chart Diagram about Population, SC, ST and Literacy in Surrounding Villages



**Figure 3.28 Chart Diagram about Workers Profile in Surrounding Villages**

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 for the assessment of awareness about the project activities and opinion about it, following salient observations were recorded,

During survey it was observed that only nearby villagers are aware and other villagers are not aware about the proposed project.

People in the region expect job opportunities and improvement in educational, transportation and sanitation facility from project authority.

### **3.7.6 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, additional schools for girls, furniture and equipment in schools, up-gradation of existing school infrastructure.

- 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.
- 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.

### **3.7.7 Conclusion**

The socio-economic study of surveyed villages gives a clear picture of its population, average household size, literacy rate and sex ratio etc. It is also found that a part of population is suffering from lack of permanent job to run their day-to-day life. To evaluate the impacts of proposed quarry project on the surrounding area, it is vital to assess the baseline status of the environmental quality in the locality of the site. Hence, it can be concluded that the present environment status of the study area will not be affected by the Irudhukottai Colour Granite cluster Quarries projects. Hence, we adopt adequate control measures to protect the surrounding environment and will contribute in development of the study areas. The proposed project will provide preferential of employment to the local people there by the livelihood standards will be improved.

### **3.8 TRAFFIC DENSITY**

The traffic survey conducted based on the transportation route of material, the Colour Granite is proposed to be transported mainly through Village Rode and Denkanikottai to Bettamugilalam village road as shown in Table 3.34-3.37 and in Figure 3.29. 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 3.34 Traffic Survey Locations**

| Station Code | Road Name                       | Distance and Direction | Type of Road                    |
|--------------|---------------------------------|------------------------|---------------------------------|
| TS1          | Village Road                    | 0.26km NW              | Village Road                    |
| TS2          | Denkanikottai to Bettamugilalam | 3.0km N                | Denkanikottai to Bettamugilalam |

Source: On-site monitoring by GTMS FAE & TM

**Table 3.35 Existing Traffic Volume**

| Station code | HMV |     | LMV |     | 2/3 Wheelers |     | Total PCU |
|--------------|-----|-----|-----|-----|--------------|-----|-----------|
|              | No  | PCU | No  | PCU | No           | PCU |           |
| TS1          | 16  | 48  | 28  | 28  | 45           | 23  | 99        |
| TS2          | 115 | 345 | 47  | 47  | 88           | 44  | 436       |

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 3.36 Multi Colour Granite Transportation Requirement**

| Transportation of Multi Colour Granite per day |                      |               |
|------------------------------------------------|----------------------|---------------|
| Capacity of trucks                             | No. of Trips per day | Volume in PCU |
| 15 tonnes                                      | 1                    | 3             |

Source: Approved Mining Plan

**Table 3.37 Summary of Traffic Volume**

| Route                      | Existing traffic volume in PCU | Incremental traffic due to the project | Total traffic volume | Hourly Capacity in PCU as per IRC – 1960 guidelines |
|----------------------------|--------------------------------|----------------------------------------|----------------------|-----------------------------------------------------|
| Village Road               | 99                             | 3                                      | 102                  | 1200                                                |
| Uthangarai–Krishnagri NH77 | 436                            | 3                                      | 439                  | 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.

### 3.9 SITE SPECIFIC FEATURES

There are no Wildlife Sanctuaries, National Park within the project area to 10 km radius. There is no Protected Forest area within 10 km radius from the proposed project area. Therefore, there will be no need of acquisition/diversion of forest land. The details related to the environment sensitivity around the proposed mine lease area i.e., 10 km radius and the nearby water bodies are given in the Table 3.38.



**Table 3.38 Details of Environmentally Sensitive Ecological Features in the Study Area**

| <b>S. No</b> | <b>Sensitive Ecological Features</b>              | <b>Name</b>                      | <b>Areal Distance in km from cluster</b> |
|--------------|---------------------------------------------------|----------------------------------|------------------------------------------|
| 1            | National Park / Wild life Sanctuaries             | Cauvery North wildlife sanctuary | 1.82km-SE                                |
| 2            | Reserve Forest                                    | Aiyur Ext-I R.F                  | 2.68km-NE                                |
|              |                                                   | Panai R.F                        | 7.19km-SW                                |
|              |                                                   | Kollatti                         | 2.22km-SW                                |
|              |                                                   | Denkanikotta R.F                 | 7.05km- N                                |
|              |                                                   | Noganur                          | 4.78km-NW                                |
|              |                                                   | Manchi R.F                       | 8.09km-SW                                |
|              |                                                   | Udedurgam R.F                    | 6.95km-NE                                |
|              |                                                   | Tholuvabetta R.F                 | 4.27km-S                                 |
|              |                                                   | Marandahalli R.F                 | 7.08km-NE                                |
|              |                                                   | Sameri R.F                       | 4.74km-SE                                |
|              |                                                   | Galigattam R.F                   | 9.31km-SE                                |
| 3            | Lakes/ Reservoirs/ Dams/Streams/Rivers            | Nemrelli lake                    | 1.47km-N                                 |
| 4            | Tiger Reserve/Elephant Reserve/ Biosphere Reserve | None                             | Nil within 10km radius                   |
| 5            | Critically Polluted Areas                         | None                             | Nil within 10km radius                   |
| 6            | Mangroves                                         | None                             | Nil within 10km radius                   |
| 7            | Mountains/Hills                                   | None                             | Nil within 10km radius                   |
| 8            | Notified Archaeological Sites                     | None                             | Nil within 10km radius                   |
| 9            | Industries/ Thermal Power Plants                  | None                             | Nil within 10km radius                   |
| 10           | Defense Installation                              | None                             | Nil within 10km radius                   |

Source: Survey of India Toposheet

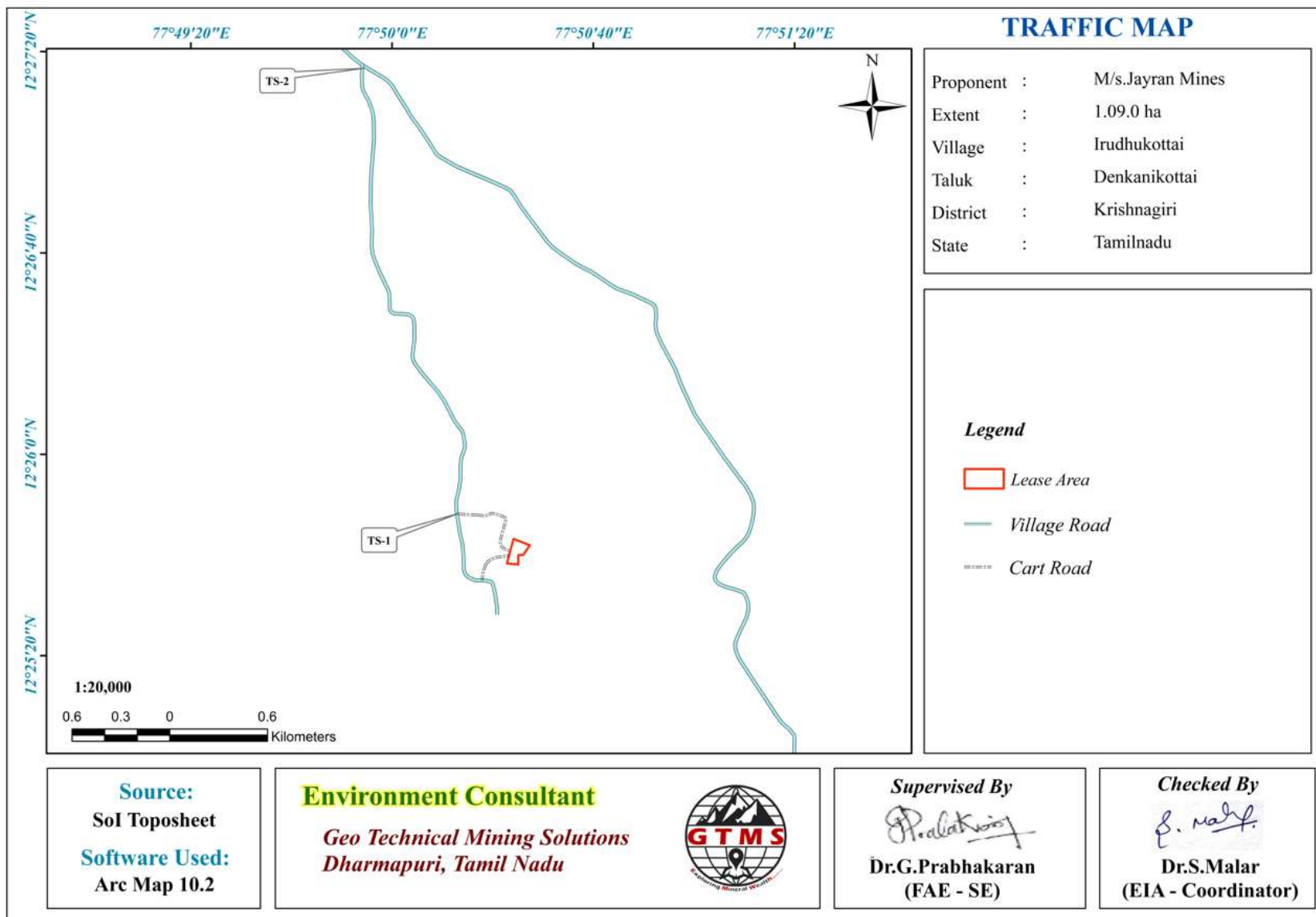


Figure 3. 29 Traffic Density Map



**Figure 3.30 Baseline monitoring Photos**



## CHAPTER IV

### ANTICIPATED ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

#### 4.0 GENERAL

In order to maintain the environmental commensuration with the mining operation, it is essential to undertake studies on the existing environmental scenario and assess the impact on different environmental components. This would help in formulating suitable management plans sustainable resource extraction. This chapter discusses the anticipated impacts on soil, land, water, air, noise, biological, and socioeconomic environments.

#### 4.1 LAND ENVIRONMENT

##### 4.1.1 Anticipated Impact

- ✚ Permanent change on land use and land cover.
- ✚ Change in topography of the mine lease area.
- ✚ Problems to agricultural land and human habitations due to dust, and noise caused by movement of heavy vehicles.
- ✚ Degradation of the aesthetic environment of the core zone due to quarrying
- ✚ Soil erosion and sediment deposition in the nearby agricultural fields during the rainy season
- ✚ Increase in agricultural productivity of land when mine water is discharged to the surrounding lands for irrigation.

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

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

## **4.2 SOIL ENVIRONMENT**

### **4.2.1 Anticipated Impact on Soil Environment**

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

### **4.2.2 Common Mitigation Measures from proposed project**

- ✚ Construction of garland drains, settling pits, and check dams to prevent runoff and siltation
- ✚ Run-off diversion – Garland drains will be constructed around the project boundary to prevent surface flows from entering the quarry works areas and will be discharged into the settling tanks to reduce suspended sediment loads before runoff is discharged from the quarry site.
- ✚ Retain existing or re-plant the vegetation will be retained at the site wherever possible.  
Monitoring and maintenance – Weekly monitoring and daily maintenance of erosion control systems so that they perform as specified specially during rainy season

## **4.3 WATER ENVIRONMENT**

### **4.3.1 Anticipated Impact**

- ✚ Surface and ground water resources may be contaminated due to pit water discharge, domestic sewage, discharge of oil and grease bearing waste water from washing of vehicles and machineries, and washouts from surface exposure or working areas
- ✚ As the proposed project acquires 3.0KLD of water from water vendors, it will not extract water by developing abstraction structures in the lease area. Therefore, the project will not have impact on depletion of aquifer beneath the lease area.

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

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

## 4.4 AIR ENVIRONMENT

### 4.4.1 Anticipated Impact from proposed project

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

#### 4.4.1.1 Emission Estimation

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

**Table 4.1 Empirical Formula for Emission Rate from Overall Mine**

| Source       | 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); $p$ = Mineral production (Mt/yr); $b$ = Overburden handling (Mm <sup>3</sup> /yr); $a$ = Lease area(km <sup>2</sup> ); $E$ = Emission rate(g/s). |

The emission rate thus calculated using the empirical formula is used as one of the inputs in the AERMOD modelling. As the SPM emission calculation for overall mine is not considering pollution control measures, one-third of the SPM value is taken for derivation of PM<sub>10</sub> keeping in mind that proper control measures are followed. It is important to note that PM<sub>10</sub> emission rate is derived from the SPM estimation in the background that PM<sub>10</sub> constitutes 52% of SPM emission. The PM<sub>10</sub>, and PM<sub>2.5</sub> emission results have been given in Table 4.2.

**Table 4.2 Estimated Emission Rate**

| Activity     | Pollutant         | Calculated Value (g/s) | Lease Area in m <sup>2</sup> | Calculated Value (g/s/m <sup>2</sup> ) |
|--------------|-------------------|------------------------|------------------------------|----------------------------------------|
| Overall Mine | PM <sub>2.5</sub> | 0.0000010135           | 10900                        | 5.38766E-05                            |
| Overall Mine | PM <sub>10</sub>  | 0.00000050675          |                              | 8.0815E-06                             |

#### 4.4.1.2 Modelling of Incremental Concentration

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

#### 4.4.1.3 Model Results

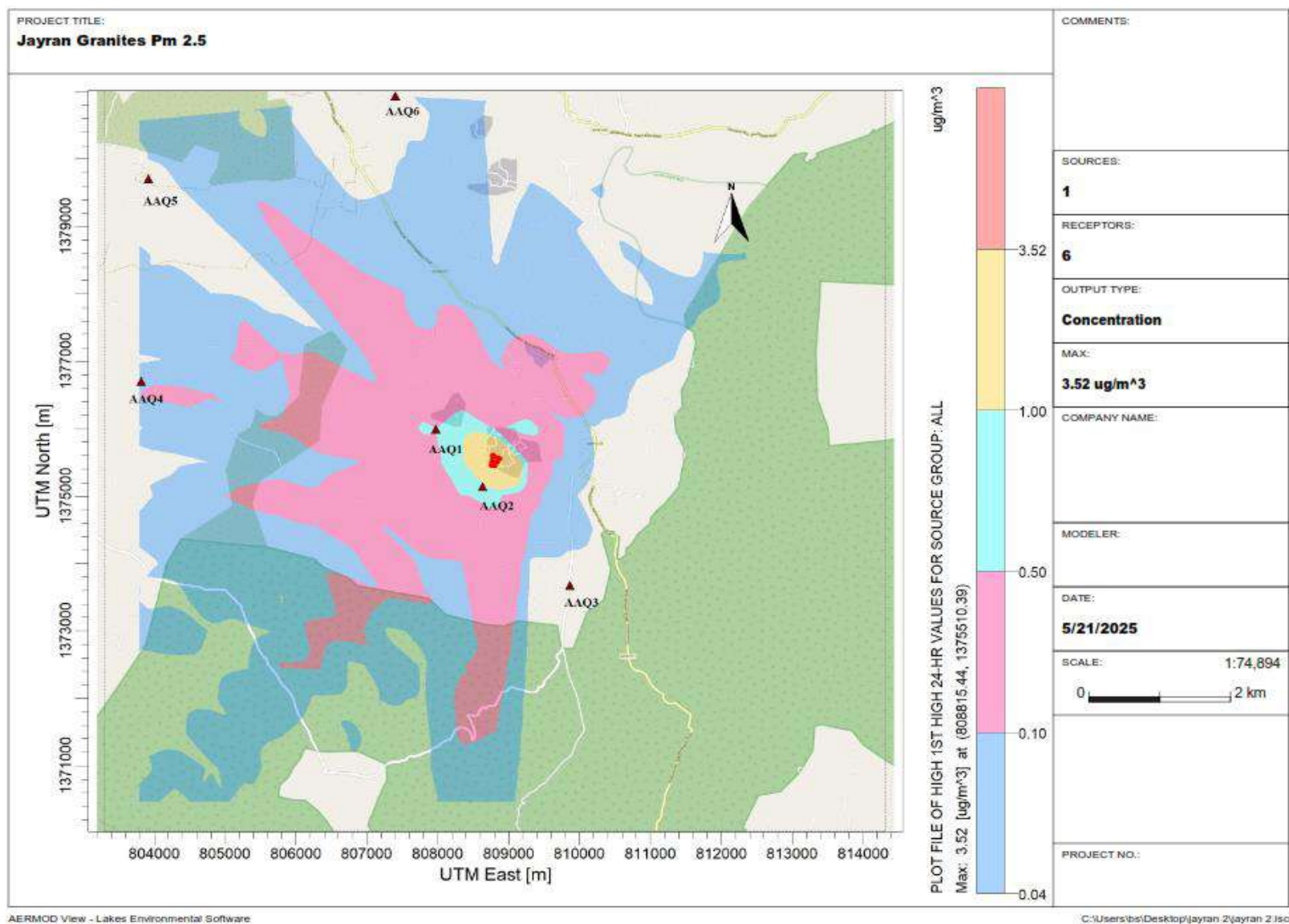
The post project Resultant Concentrations of PM<sub>10</sub>, PM<sub>2.5</sub>, is given in the table shown below:

#### Mitigation Measures

- ✚ To control dust at source, wet drilling will be practiced. Where there is a scarcity of water, suitably designed dust extractor will be provided for dry drilling along with dust hood at the mouth of the drill-hole collar
- ✚ Dust mask will be provided to the workers and their use will be strictly monitored
- ✚ Water will be sprinkled on haul roads twice a day to avoid dust generation during transportation
- ✚ Transportation of material will be carried out during day time and material will be covered with tarpaulin
- ✚ The speed of tippers plying on the haul road will be limited to < 20 km/hr to avoid generation of dust
- ✚ The un-metalled haul roads will be compacted weekly before being put into use
- ✚ It will be ensured that all transportation vehicles carry a valid PUC certificate
- ✚ Haul roads and service roads will be graded to clear accumulation of loose materials
- ✚ Planting of trees all along main mine haul roads and around the project site will be practiced to prevent the generation of dust
- ✚ Dust mask will be provided to the workers and their use will be strictly monitored

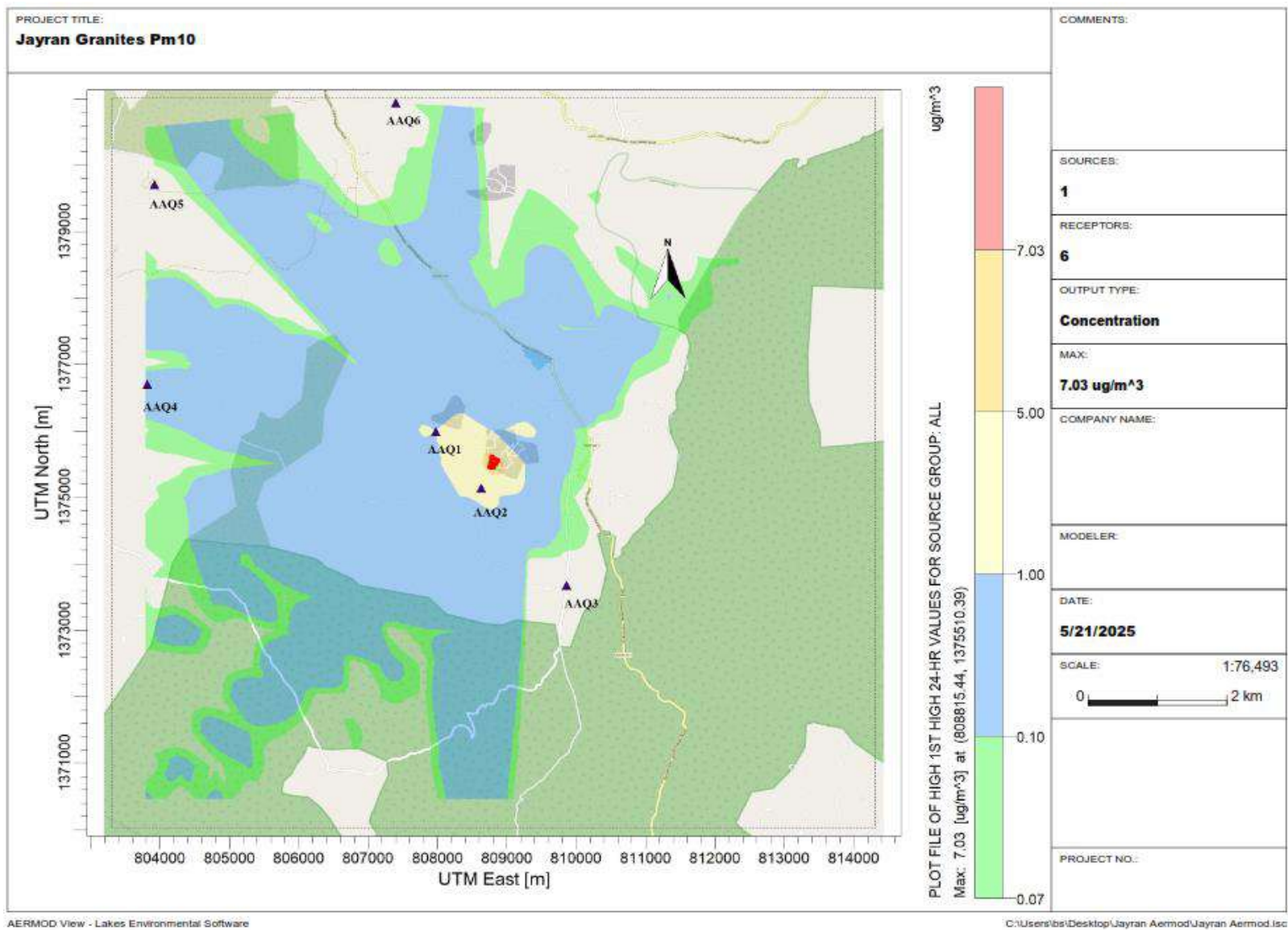
**Table 4.3 Incremental & Resultant GLC of PM<sub>2.5</sub>**

| Station ID | Distance to core area (km) | Direction | PM <sub>2.5</sub> concentrations(µg/m <sup>3</sup> ) |           |       | Comparison against air quality standard (60 µg/m <sup>3</sup> ) | Magnitude of change (%) | Significance    |
|------------|----------------------------|-----------|------------------------------------------------------|-----------|-------|-----------------------------------------------------------------|-------------------------|-----------------|
|            |                            |           | Baseline                                             | Predicted | Total |                                                                 |                         |                 |
| AAQ1       | 0.90                       | NW        | 15.5                                                 | 1.0       | 16.5  | Below standard                                                  | 6.5                     | Not significant |
| AAQ2       | 0.33                       | SW        | 14.4                                                 | 1.0       | 15.4  |                                                                 | 6.9                     |                 |
| AAQ3       | 2.05                       | SE        | 13.3                                                 | 0.0       | 13.3  |                                                                 | 0.0                     |                 |
| AAQ4       | 5.08                       | NW        | 15.1                                                 | 0.10      | 15.2  |                                                                 | 0.7                     |                 |
| AAQ5       | 4.16                       | N         | 15.7                                                 | 0.0       | 15.7  |                                                                 | 0.0                     |                 |
| AAQ6       | 5.51                       | NNW       | 14.6                                                 | 0.0       | 14.6  |                                                                 | 0.0                     |                 |



**Figure 4. 1 Predicted Incremental Concentration of PM<sub>2.5</sub>**





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

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

| Station ID | Distance to core area (km) | Direction | PM <sub>10</sub> concentrations(µg/m <sup>3</sup> ) |           |       | Comparison against air quality standard | Magnitude of change (%) | Significance    |
|------------|----------------------------|-----------|-----------------------------------------------------|-----------|-------|-----------------------------------------|-------------------------|-----------------|
|            |                            |           | Baseline                                            | Predicted | Total |                                         |                         |                 |
| AAQ1       | 0.90                       | NW        | 44.3                                                | 5.0       | 49.3  | Below standard                          | 11.3                    | Not significant |
| AAQ2       | 0.33                       | SW        | 41.0                                                | 5.0       | 46    |                                         | 12.2                    |                 |
| AAQ3       | 2.05                       | SE        | 33.2                                                | 0.0       | 33.2  |                                         | 0.0                     |                 |
| AAQ4       | 5.08                       | NW        | 37.7                                                | 1.0       | 38.7  |                                         | 2.7                     |                 |
| AAQ5       | 4.16                       | N         | 39.3                                                | 0.0       | 39.3  |                                         | 0.0                     |                 |
| AAQ6       | 5.51                       | NNW       | 41.0                                                | 0.0       | 41    |                                         | 0.0                     |                 |

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

#### **4.5 NOISE ENVIRONMENT**

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

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

Where, L<sub>p1</sub> & L<sub>p2</sub> are sound levels at points located at distances r<sub>1</sub> and r<sub>2</sub> from the source; A<sub>e1,2</sub> is the excess attenuation due to environmental conditions. Combined effect of all sources can be determined at various locations by logarithmic addition.

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

#### 4.5.1 Anticipated Impact

The attenuation due to several factors including ground reflection, atmosphere, wind speed, temperature, trees, and buildings as 35.5 dB (A), the barrier effect. Attenuation due to Green Belt has been taken to be 4.9 dB (A). The inputs required for the model are: source data, receptor data, and attenuation factor. Source data has been computed taking into account of all the machinery and activities used in the mining process. Same has been listed in Table 4.5

**Table 4.5 Activity and Noise Level Produced by Machinery**

| S.No.                       | Machinery / Activity | Impact on Environment | Noise Produced in dB(A) at 50 ft from source* |
|-----------------------------|----------------------|-----------------------|-----------------------------------------------|
| 1                           | Jack Hammer          | Yes                   | 88                                            |
| 2                           | Compressor           | No                    | 81                                            |
| 3                           | Tipper               | No                    | 84                                            |
| <b>Total Noise Produced</b> |                      |                       | <b>90.0</b>                                   |

\*50 feet from source = 15.24 meters

The total noise to be produced by mining activity is calculated to be 90.0 dB (A). Therefore, we have considered equipment and operation noise levels (max) to be approx. 90.0 dB (A) for noise prediction modelling. The results of noise prediction modelling are shown in Table 4.6

**Table 4.6 Predicted Noise Incremental Values**

| Noise Monitoring Location | Distance From Project Site(m)                                                                                      | Baseline Noise Level (dBA)m During Day Time | Predicted Noise Level(dBA) | Total(dBA) |
|---------------------------|--------------------------------------------------------------------------------------------------------------------|---------------------------------------------|----------------------------|------------|
| Core                      | 860                                                                                                                | 49.7                                        | 25.3                       | 49.7       |
| Thottikuppam              | 260                                                                                                                | 45.1                                        | 35.7                       | 45.6       |
| Javanachandram            | 2030                                                                                                               | 42.5                                        | 17.8                       | 42.5       |
| Bikkanapally              | 5030                                                                                                               | 39                                          | 9.9                        | 39.0       |
| Giriyanaipalli            | 6290                                                                                                               | 41.6                                        | 8.0                        | 41.6       |
| Santhanapalli             | 5520                                                                                                               | 40.2                                        | 9.1                        | 40.2       |
| NAAQ Standards            | Industrial Day Time - 75 dB (A) & Night Time- 70 dB (A)<br>Residential Day Time -55 dB (A) & Night Time- 45 dB (A) |                                             |                            |            |

From the above table, it can be seen that the ambient noise levels at all the locations near habitations are within permissible limits of Residential Area (buffer zone) as per THE NOISE POLLUTION (REGULATION AND CONTROL) RULES, 2000. Therefore, no impact is anticipated on the noise environment due to the project

#### 4.5.2 Common Mitigation Measures

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

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

#### 4.5.3 Ground Vibrations

Major source of ground vibrations due to mining activities is blasting. In this mining project, no explosives are proposed to break the rocks. Instead, cracking powder has been proposed for cracking the solid rock along line of drilling. Therefore, it is not necessary to calculate peak particle velocity.

### 4.6 ECOLOGY AND BIODIVERSITY

#### 4.6.1 Impact on Ecology and Biodiversity

- ✚ There shall be negligible air emissions or effluents from the project site. During loading the truck, dust generation will be likely. This shall be a temporary effect and not anticipated to affect the surrounding vegetation significantly
- ✚ Most of the land in the buffer area is undulating terrain with crop lands, grass patches and small shrubs. Hence, there will be no effect on flora of the region.
- ✚ A total of 17 species belonging to 12 families have been recorded from the mining lease area. 2 trees, 6 shrubs and 9 herbs were identified. The survival rate of uprooted trees is 30% Quarry so instead of one tree 10 saplings are bought and planted in 7.5 conservation zone.
- ✚ Carbon released from quarrying machineries and tippers during quarrying would be 34 kg per day, 9065kg per year and 45326 kg over five years, as provided in Table 4.7.

**Table 4.7 Carbon Released During Five Years of colour Granite Production**

|                                   | <b>Per day</b> | <b>Per year</b> | <b>Per five years</b> |
|-----------------------------------|----------------|-----------------|-----------------------|
| Fuel consumption of excavator     | 34             | 9065            | 45326                 |
| Total fuel consumption in litters | 718            | 194005          | 970026                |
| CO <sub>2</sub> emission in kg    | 2014           | 544228          | 2721143               |

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

**Carbon Sequestration**

- To mitigate carbon emission due to mining activities, we recommend planting trees around the quarry to offset the carbon emission during quarrying. A tree can sequester 13067 kg of carbon per year. Therefore, we recommend planting large number of trees around the quarry and near school campuses, government wasteland, roadsides etc.
- As per the greenbelt development plan as recommended by SEAC (Table 4.19), about 935 trees will be planted within three months from the beginning of mining. These trees, when grown up would sequester carbon of about 65335 kg of the total carbon, as provided in Table 4.8.

**Table 4.8 CO<sub>2</sub> Sequestration**

|                                                          |       |        |         |
|----------------------------------------------------------|-------|--------|---------|
| CO <sub>2</sub> sequestration in kg                      | 48    | 13067  | 65335   |
| Remaining CO <sub>2</sub> not sequestered in kg          | 1966  | 531161 | 2655809 |
| Trees required for environmental compensation            | 22116 |        |         |
| Area required for environmental compensation in hectares | 44    |        |         |

**Greenbelt Development**

The main objective of the green belt is to provide a barrier between the source of pollution and the surrounding areas. In order to compensate the loss of vegetation cover, it is suggested to carry out afforestation program mainly inside and outside of the lease area in different phases. This habitat improvement program would ensure the faunal species to re-colonize and improve the abundance status in the core zone. Greenbelt development plan and budget required for green belt development plan are given in Tables 4.9-4.11. For greenbelt development, species are recommended, as shown in Table 4.9 on the basis of:

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

**Table 4.9 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 racemosa</i>     | Fabaceae    | Aathi           | Tree     |                                                                                                                                                                                                  |
| 7      | <i>Cassia fistula</i>        | Fabaceae    | Sarakondrai     | Tree     |                                                                                                                                                                                                  |
| 8      | <i>Aegle marmelos</i>        | Rutaceae    | Vilvam          | Tree     |                                                                                                                                                                                                  |
| 9      | <i>Pongamia pinnata</i>      | Fabaceae    | Pungam          | Tree     |                                                                                                                                                                                                  |
| 10     | <i>Thespesia populnea</i>    | Malvaceae   | Puvarasu        | Tree     |                                                                                                                                                                                                  |

**Table 4.10 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  |                                        |                                     |
|                                                 | 218                                          | 174                                    | 1962                                |
|                                                 | Number of plants outside the mine lease area |                                        |                                     |
|                                                 | 327                                          | 262                                    | 2943                                |
| <b>Total</b>                                    | <b>545</b>                                   | <b>436</b>                             | <b>4905</b>                         |

**Table 4.11 Budget for Greenbelt Development Plan**

| <b>Activity</b>                                           | <b>Plantation in the construction phase(3Months)</b> | <b>Cost</b>                                                                                                                                                                                                               | <b>Capital Cost (Rs.)</b> | <b>Recurring Cost-per annum</b> |
|-----------------------------------------------------------|------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------|---------------------------------|
| Plantation inside the mine lease area (in safety margins) | 218                                                  | 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))" | 43,600                    | 6,540                           |
| Plantation outside the area                               | 327                                                  | Avenue Plantation @ 300 per plant (capital) for plantation outside the lease area and @ 30 per plant maintenance (recurring)                                                                                              | 98,100                    | 9,810                           |
| <b>Total</b>                                              |                                                      |                                                                                                                                                                                                                           | <b>1,41,700</b>           | <b>16,350</b>                   |

Source: EMP budget

#### **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.

#### **4.6.4. Impact on Aquatic Biodiversity**

- ✚ 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.



- ✚ It is a granite quarry, no explosives are used, there is no possibility of vibration and dust, thus there is no possibility of damage to the adjacent agricultural land.
- ✚ Quarry approach roads are sprayed with water 3 times a day to control dust. Thus, the damage to the nearby farmlands is controlled.
- ✚ A green belt will be created in 7.5m and 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
- ✚ The speed of tippers plying on the haul road will be limited to < 20 km/hr to avoid generation of dust.

## **4.7 SOCIO ECONOMIC ENVIRONMENT**

The socio-economic impacts of mining are many. Impacts of a mine project may be positive or Negative. The adverse impacts attribute to physical displacement due to land acquisition, which is followed by loss of livelihood, mental agony, changes in social structure, and risk to food security etc., People are also directly affected due to pollution. Social Impact Assessment (SIA) is a process of analysis, monitoring and managing the social consequences of a project. Study on Socio-economic status has already been carried out using primary socio-economic survey for generating the baseline data of Socio-economic status.

### **4.7.1 Anticipated Impact**

From the primary Socio-economic survey & through secondary data available from established literature and census data 2011, it is found that there would be positive impact on Socio-economic condition of the nearby area. There is no habitation within 300 m of the proposed mining lease area. Therefore, no major impact is anticipated on the nearby habitation during the entire life of the mine.

### **4.7.2 Mitigation Measures**

- ✚ Good maintenance practices will be adopted for plant machinery and equipment, which will help to avert potential noise problems
- ✚ Green belt will be developed in and around the project site as per Central Pollution Control Board (CPCB) guidelines
- ✚ Air pollution control measure will be taken to minimize the environmental impact within the core zone

- ✚ For the safety of workers, personal protective appliances like hand gloves, helmets, safety shoes, goggles, aprons, nose masks and ear protecting devices will be provided as per mines act and rules
- ✚ Benefit to the State and the Central governments through financial revenues by way of royalty, tax, duties, etc., from this project directly and indirectly
- ✚ From above details, the quarry operations will have highly beneficial positive impact in the area.

#### **4.8 OCCUPATIONAL HEALTH AND SAFETY**

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

- ❖ Respiratory hazards
- ❖ Noise
- ❖ Physical hazards
- ❖ Occupational Health Survey

##### **4.8.1 Respiratory Hazards**

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

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

##### **4.8.2 Noise**

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

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

##### **4.8.3 Physical Hazards**

The following measures are proposed for control of physical hazards

- ❖ Specific personnel training on work-site safety management will be taken up;
- ❖ Natural barriers, temporary railing, or specific danger signals will be provided along rock benches or other pit areas where work is performed at heights more than 2m from ground level.

- ❖ Maintenance of yards, roads and footpaths, providing sufficient water drainage and preventing slippery surfaces with an all-weather surface, such as coarse gravel will be taken up.

#### **4.8.4 Occupational Health Survey**

All the persons will undergo pre-employment and periodic medical examination. Employees will be monitored for occupational diseases by conducting general physical tests, audiometric tests, full chest, X-ray, lung function tests, spiro metric tests, periodic medical examination – yearly, Lung function/ Silicosis 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 mineral mining projects. 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.

Objective of Mine closure

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

##### **4.10.1 Mine Closure criteria**

The criteria involved in mine closure are discussed below:

###### **4.10.1.1 Physical Stability**

All anthropogenic structures, which include mine workings, buildings, rest shelters etc., remaining after mine decommissioning should be physically stable. They should present no hazard to public health and safety as a result of failure or physical deterioration and they should continue to perform the functions for which they were designed. The design periods and factors

of safety proposed should take full account of extreme events such as floods, hurricane, winds or earthquakes, etc. and other natural perpetual forces like erosion, etc.

#### **4.10.1.2 Chemical Stability**

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

#### **4.10.1.3 Biological Stability**

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

- ❖ Where the nutrient level of spread topsoil is lower than material in-situ e.g., for development of social forestry
- ❖ Where it is intended to grow plants with a higher nutrient requirement than those occurring naturally, e.g., planning for agriculture
- ❖ Where it is desirable to get a quick growth response from the native flora during those times when moisture is not a limiting factor e.g., development of green barriers
- ❖ The Mine closure plan should be as per the approved mining plan. The mine closure is a part of approved mining plan and activities of closure shall be carried out as per the process described in mine closure plan (Annexure III).

## **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**

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:

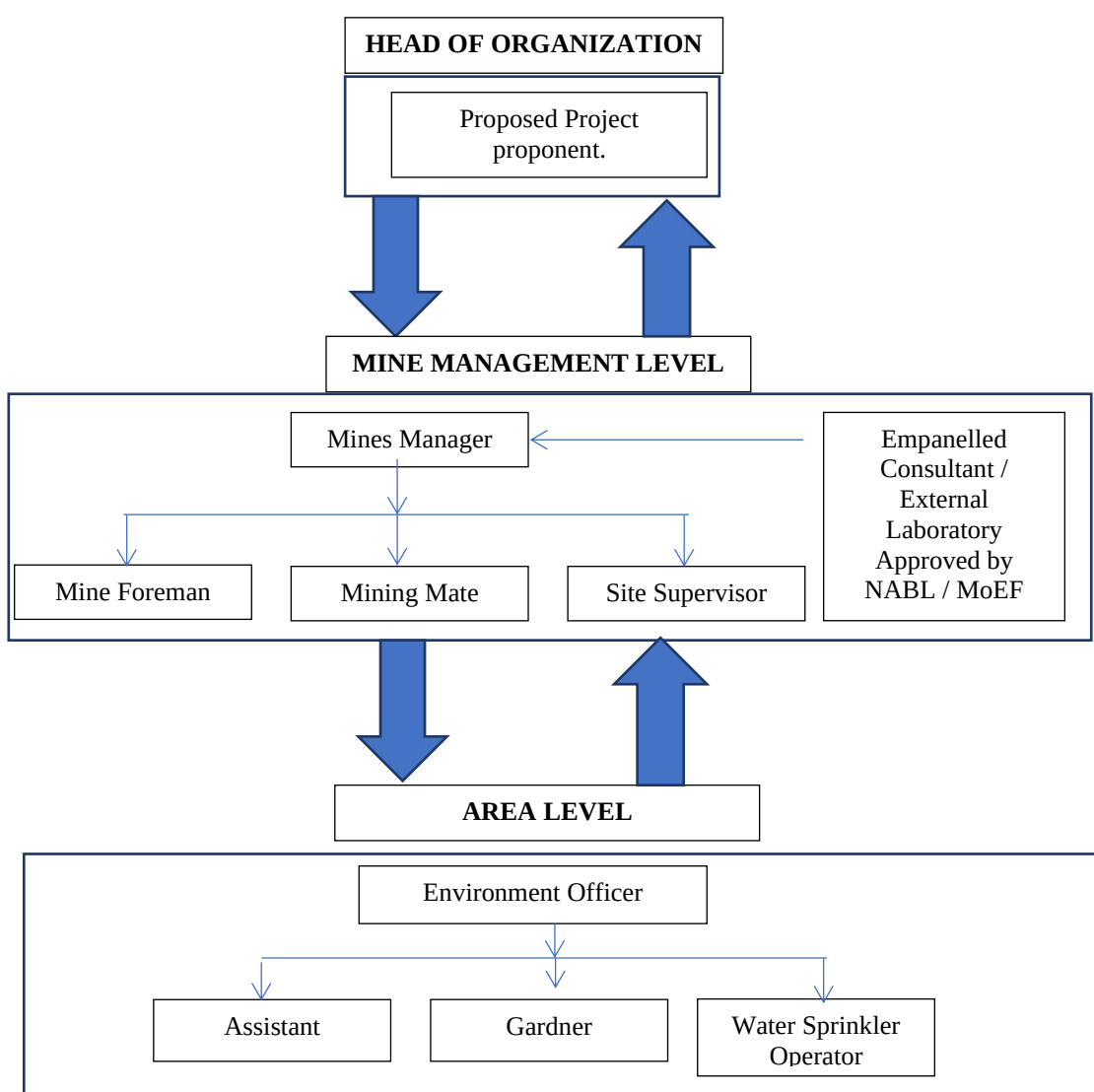
- ❖ Implementation of pollution control measures
- ❖ Monitoring programme implementation
- ❖ Post-plantation care
- ❖ To check the efficiency of pollution control measures taken
- ❖ Any other activity as may be related to environment

- ❖ 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: EIA 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 heavy mining machineries. | Improper handling and unsafe working practice                                    | <ul style="list-style-type: none"> <li>✓ All safety precautions and provisions of Mine Act, 1952, Metalliferous Mines Regulation, 1961 and Mines Rules, 1955 will be strictly followed during all mining operations.</li> <li>✓ Workers will be sent to the Training in the nearby Group Vocational Training Centre Entry of unauthorized persons will be prohibited.</li> <li>✓ Fire-fighting and first-aid provisions in the mine office complex and mining area.</li> <li>✓ Provisions of all the safety appliances such as safety boot, helmets, goggles etc. will be made available to the employees and regular check for their use.</li> <li>✓ Working of quarry, as per approved plans and regularly updating the mine plans.</li> <li>✓ Cleaning of mine faces on daily basis shall be daily done in order to avoid any overhang or undercut.</li> <li>✓ Handling of explosives, charging and firing shall be carried out by competent persons only under the supervision of a Mine Manager.</li> <li>✓ Maintenance and testing of all mining equipment as per manufacturer's guidelines.</li> </ul> |
| 2      | Drilling                                                  | Improper and unsafe practices; Due to high pressure of compressed air, hoses may | <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> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |

|   |                    |                                                                                                                                                                                                                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
|---|--------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|   |                    | burst; Drill Rod may break;                                                                                                                                                                                                       | <ul style="list-style-type: none"> <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 compressor and drill equipment as per operator manual.</li> <li>✓ All drills unit shall be provided with wet drilling shall be maintained in efficient working in condition.</li> <li>✓ Operator shall regularly use all the personal protective equipment.</li> </ul>                                                                                                                                                                                                                                                                                             |
| 3 | Transportation     | <p>Potential hazards and unsafe workings contributing to accident and injuries</p> <p>Overloading of material</p> <p>While reversal &amp; overtaking of vehicle</p> <p>Operator of truck leaving his cabin when it is loaded.</p> | <ul style="list-style-type: none"> <li>✓ Before commencing work, drivers personally check the truck/tipper for oil(s), fuel and water levels, tyre inflation, general cleanliness and inspect the brakes, steering system, warning devices including automatically operated audio-visual reversing alarm, rear view mirrors, side indicator lights etc., are in good condition.</li> <li>✓ Not allow any unauthorized person to ride on the vehicle nor allow any unauthorized person to operate the vehicle.</li> <li>✓ Concave mirrors should be kept at all corners</li> <li>✓ All vehicles should be fitted with reverse horn with one spotter at every tipping point</li> <li>✓ Loading according to the vehicle capacity</li> <li>✓ Periodical maintenance of vehicles as per operator manual</li> </ul> |
| 4 | Natural calamities | Unexpected happenings                                                                                                                                                                                                             | <ul style="list-style-type: none"> <li>✓ Escape Routes will be provided to prevent inundation of storm water</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |

|   |                                       |                                      |                                                                                        |
|---|---------------------------------------|--------------------------------------|----------------------------------------------------------------------------------------|
|   |                                       |                                      | ✓ Fire Extinguishers & Sand buckets                                                    |
| 5 | Failure of Mine Benches and Pit Slope | Slope geometry, Geological structure | ✓ Ultimate or over all pit slope shall be below 60° and each bench height shall be 5m. |

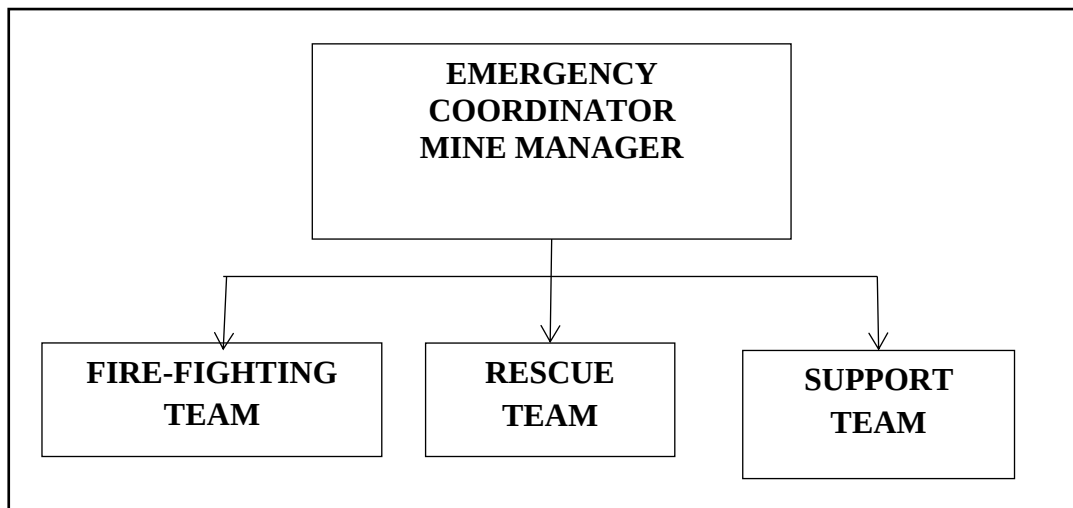
*Source: Analysed and proposed by FAE & EC*

### 7.3 DISASTER MANAGEMENT PLAN FOR PROPOSED PROJECT

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

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

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



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

### **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 on air & noise environment is mainly anticipated due to drilling, excavation, movement of HEMM and transportation activities in all the quarries (proposed and existing) within the cluster. For this cumulative study, one proposed projects, known as P1 taken into consideration. The details of P1 have been given in Table 1.3.

### 7.4.1 Air Environment

Calculation of the cumulative production load of granite from the one proposed project within the cluster have been given in the Table.7.2

**Table 7.2 Cumulative Production Load of Granite**

| Quarry       | Granite @30% recovery in m <sup>3</sup> |                            |                           |                    | Granite Waste @ 70% in m <sup>3</sup> |                            |                           |                    |
|--------------|-----------------------------------------|----------------------------|---------------------------|--------------------|---------------------------------------|----------------------------|---------------------------|--------------------|
|              | 5 years in m <sup>3</sup>               | Per Year in m <sup>3</sup> | Per Day in m <sup>3</sup> | Lorry Load Per day | 5 years in m <sup>3</sup>             | Per Year in m <sup>3</sup> | Per Day in m <sup>3</sup> | Lorry Load Per day |
| <b>P1</b>    | 7500                                    | 1500                       | 1                         | <b>1</b>           | 17500                                 | 3500                       | 13                        | 2                  |
| <b>Total</b> | <b>7500</b>                             | <b>1500</b>                | <b>1</b>                  | <b>1</b>           | <b>17500</b>                          | <b>3500</b>                | <b>13</b>                 | <b>2</b>           |

The overall production of Proposed Quarry is of about granite recovery is 1m<sup>3</sup> per day with a capacity of 1 trip per day, about granite waste is 13m<sup>3</sup> per day with a capacity of 2 trips per day.

#### 7.4.1.1 Cumulative Impact of Air Pollutants

The results on the cumulative impact from the three proposed projects on air environment of the cluster have been provided in Table 7.3. The cumulative values resulting from the project for each pollutant do not exceed the permissible limits set by CPCB.

**Table 7.3 Incremental and Resultant Ground Level Concentration from the Quarry**

| Pollutants        | Baseline Data (µg/m <sup>3</sup> ) | Incremental Values (µg/m <sup>3</sup> ) | Cumulative Value (µg/m <sup>3</sup> ) |
|-------------------|------------------------------------|-----------------------------------------|---------------------------------------|
|                   |                                    | P1                                      |                                       |
| PM <sub>2.5</sub> | 14.80                              | 3.52                                    | 18.32                                 |
| PM <sub>10</sub>  | 39.40                              | 7.03                                    | 46.43                                 |

### 7.4.2 Noise Environment

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

**Table.7.4 Predicted Noise Incremental Values from Cluster**

| 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               | 860          | SE        | 49.7                         | 19.17                   | 25.3                  | 55                               |
| Habitation Near E1               | 250          | SW        | 45.1                         | 17.10                   | 45.11                 |                                  |
| Habitation Near E2               | 260          | NE        | 45.1                         | 23.84                   | 45.13                 |                                  |
| Habitation Near E3               | 240          | NE        | 44.9                         | 18.36                   | 44.83                 |                                  |
| Habitation Near E5               | 300          | SE        | 43.8                         | 19.16                   | 44.32                 |                                  |
| Habitation Near E5               | 280          | SE        | 44.1                         | 18.74                   | 45.9                  |                                  |
| <b>Cumulative Noise (dB (A))</b> |              |           |                              |                         | <b>48.7</b>           |                                  |

Source: Lab Monitoring Data

The cumulative analysis of noise due to three proposed project shows that habitation near P1 will receive about 48.7dB (A), as shown in Table 7.6. The cumulative results for the habitation in consideration do not exceed the limit set by CPCB for residential areas for day time.

### 7.4.3 Socio Economic Environment

Socio Economic benefits of the three proposed project were calculated and the results have been shown in Table 7.5 the Proposed project will contribute Rs. 10,00,000/-towards CER fund.

**Table 7.5 Socio Economic Benefits from Proposed Quarry**

| Location ID        | Project Cost          | CER Cost             |
|--------------------|-----------------------|----------------------|
| P1                 | Rs.2,51,30,000        | Rs. 10,00,000        |
| <b>Grand Total</b> | <b>Rs.2,51,30,000</b> | <b>Rs. 10,00,000</b> |

**Table 7.6 Employment Benefits from Proposed Quarry**

| Location ID        | Employment |
|--------------------|------------|
| P1                 | 17         |
| <b>Grand Total</b> | <b>17</b>  |

A total of 17 people will get direct employment due to proposed mines in cluster

#### 7.4.4 Ecological Environment

**Table 7.7 Greenbelt Development Benefits from Proposed Quarry**

| ID           | No of Trees proposed to be planted | Area to be covered (m <sup>2</sup> ) | Name of the Species               | No. of Trees expected to be grown @ 80% survival rate |
|--------------|------------------------------------|--------------------------------------|-----------------------------------|-------------------------------------------------------|
| P1           | 545                                | 4905                                 | Neem,<br>Pongamia, Teak,<br>etc., | 433                                                   |
| <b>Total</b> | <b>545</b>                         | <b>4905</b>                          |                                   | <b>433</b>                                            |

Cumulative studies show that the three proposed projects will plant about 3155 native tree species like Neem, Teak, etc both inside and outside the lease area. It is expected that 80 % of trees, i.e., 2524 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 7.8.

**Table 7.8 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 Irudukottai Village aims to produce **7500 m<sup>3</sup>** of colour granite 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 17 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 about 8 persons in the form of contractual jobs, business opportunities, and service facilities etc. Because of this, the economic status of the local people will improve.

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

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

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

The proposed quarry project is located in Irudukottai Village, Denkanikottai Taluk, Krishnagiri District and 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 10 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 Irudukottai Village. CSR budget is allocated as 2.5% of the profit.

## 8.7 CORPORATE ENVIRONMENT RESPONSIBILITY

Allocation for Corporate Environment Responsibility (CER) shall be made as per Government of India, MoEF & CC Office Memorandum F.No.22-65/2017-IA.III dated 01.05.2018. As per para 6 (II) of the office memorandum, being a green field project & capital investment is  $\leq 100$  crores, the proposed project shall contribute 2% of capital investment towards CER as per directions of EAC/SEAC. However, the SEAC has suggested to allocate CER fund on the basis of the extent of the project. Therefore, **Rs. 10,00,000** 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.10,00,000        |
|        | <b>Total</b>                                                                                                                                                                                                                                    | <b>Rs.10,00,000</b> |

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

## 8.8 SUMMARY OF PROJECT BENEFITS

The project would pay about **Rs. 3,47,62,000** to the state government through various ways, as provided in Table 8.2.

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

| Particulars                                                                                          | Budget (Rs.)           |                      |
|------------------------------------------------------------------------------------------------------|------------------------|----------------------|
|                                                                                                      | @ 30% Granite Recovery | @70% Granite Wastage |
| CER                                                                                                  | 10,00,000              |                      |
| Seigniorage @ Rs.3133/m <sup>3</sup> of Granite recovery<br>Rs.265/m <sup>3</sup> of Granite wastage | 2,34,97,500            | 46,37,500            |
| District Mineral Foundation Tax @ 10% of Seigniorage                                                 | 23,49,750              | 4,63,750             |
| Green Tax @ 10% of Seigniorage                                                                       | 23,49,750              | 4,63,750             |
| <b>Total</b>                                                                                         | <b>2,91,97,000</b>     | <b>55,65,000</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. Jayran Mines** 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**

| <b>Attribute</b>       | <b>Mitigation measures</b>                                                                   | <b>Provision for Implementation</b>                                                                                            | <b>Capital Cost (Rs.)</b> | <b>Recurring Cost/annum (Rs.)</b> |
|------------------------|----------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------|---------------------------|-----------------------------------|
| <b>Air Environment</b> | Compaction, gradation and drainage on both sides                                             | Rental Dozer & drainage construction on haul road @ Rs. 10,000/- per hectare and yearly maintenance @ Rs. 10,000/- per hectare | 10900                     | 10900                             |
|                        | Fixed Water Sprinkling Arrangements + Water sprinkling by own water tankers                  | Fixed sprinkler installation and new water tanker cost for capital; and water sprinkling (thrice a day) cost for recurring     | 800000                    | 50000                             |
|                        | Air quality will be regularly monitored as per norms within ML area & ambient area           | Yearly compliance as per CPCB norms                                                                                            | 0                         | 50000                             |
|                        | Muffle blasting – To control fly rocks during blasting                                       | Blasting face will be covered with sand bags / steel mesh / old tyres / used conveyor belts                                    | 0                         | 5000                              |
|                        | Wet drilling procedure / latest eco-friendly drill machine with separate dust extractor unit | Dust extractor @ Rs. 25,000/- per unit deployed as capital & @ Rs. 2500 per unit recurring cost for maintenance                | 75000                     | 7500                              |
|                        | No overloading of trucks/tippers/tractors                                                    | Manual Monitoring through Security guard                                                                                       | 0                         | 5000                              |

|                              |                                                                                                                            |                                                                         |               |               |
|------------------------------|----------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------|---------------|---------------|
|                              | Stone carrying trucks will be covered by tarpaulin to avoid escape of fines to the atmosphere                              | Monitoring if trucks will be covered by tarpaulin                       | 0             | 10000         |
|                              | Enforcing speed limits of 20 km/hr within ML area                                                                          | Installation of speed Governors @ Rs. 5000/- per tipper/dumper deployed | 5000          | 0             |
|                              | Regular monitoring of exhaust fumes as per RTO norms                                                                       | Monitoring of exhaust fumes                                             | 0             | 1250          |
|                              | Regular sweeping and maintenance of roads for at least about 200 m from quarry entrance                                    | Provision for 2 labours @ Rs.10,000/labour (Contractual)                | 0             | 21800         |
|                              | Installing wheel wash system near exit gate of quarry                                                                      | Installation + Maintenance + Supervision                                | 50000         | 20000         |
| <b>Total Air Environment</b> |                                                                                                                            |                                                                         | <b>940900</b> | <b>181450</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                                                                                               | 0            | 0           |
|                                | NONEL Blasting will be practiced to control Ground vibration and fly rocks                                             | Rs. 30/- per 6 tons of blasted material                                                                                                 | 0            | 0           |
| <b>Total Noise Environment</b> |                                                                                                                        |                                                                                                                                         | <b>0</b>     | <b>0</b>    |
| <b>Water Environment</b>       | Water Management                                                                                                       | Provision for garland drain @ Rs. 10,000/- per hectare with maintenance of Rs. 5,000/- per annum                                        | 10900        | 5450        |
| <b>Total Water Environment</b> |                                                                                                                        |                                                                                                                                         | <b>10900</b> | <b>5450</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> |
| <b>Implementation of EC, Mining Plan &amp; DGMS Condition</b> | Size 6' X 5' with blue background and white letters as mentioned in MoM Appendix II by the SEAC TN | Fixed display board at the quarry entrance as permanent structure                                                 | 10000        | 1000         |
| <b>Total Implementation of EC &amp; Mining</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) | 68000        | 17000        |
|                                                               | Health checkup for workers will be provisioned                                                     | IME & PME Health checkup @ Rs. 1000/- per employee                                                                | 0            | 17000        |
|                                                               | First aid facility will be provided                                                                | Provision of 2 Kits per Hectare @ Rs. 2000/-                                                                      | 0            | 4360         |
|                                                               | 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                               | 218000       | 10900        |

|                                             |                                                                                                                                                                                          |                                                                                                                                                                                                                                |               |               |
|---------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------|---------------|
|                                             | 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                                                                                                                    | 54500         | 10900         |
|                                             | Installation of CCTV cameras in the mines and mine entrance                                                                                                                              | Camera 4 Nos, DVR, Monitor with internet facility                                                                                                                                                                              | 30000         | 5000          |
|                                             | Implementation as per Mining Plan and ensure safe quarry working                                                                                                                         | Mines Manager (1 <sup>st</sup> Class / 2 <sup>nd</sup> Class / Mine Foreman) under regulation 34 / 34 (6) of MMR, 1961 and Mining Mate under regulation 116 of MMR,1961 @ 40,000/- for Manager & @ 25,000/- for Foreman / Mate | 0             | 780000        |
| <b>Total Occupational Health and Safety</b> |                                                                                                                                                                                          |                                                                                                                                                                                                                                | <b>380500</b> | <b>847160</b> |
| <b>Development of Green Belt</b>            | Green belt development - 500 trees per hectare (200 Inside Lease Area & 300 Outside Lease Area)                                                                                          | Site clearance, preparation of land, digging of pits / trenches, soil amendments, transplantation of saplings @ 200 per plant (capital) for plantation inside the lease area and @ 30 per plant maintenance (recurring))"      | 43600         | 6540          |
|                                             |                                                                                                                                                                                          | Avenue plantation @ 300 per plant (capital) for plantation outside the lease area and @ 30 per plant maintenance (recurring)                                                                                                   | 98100         | 9810          |

|                                        |                                                                                                                                                                                                                                   |                                                                                                                                         |                |                |
|----------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------|----------------|----------------|
| <b>Total Development of Green Belt</b> |                                                                                                                                                                                                                                   |                                                                                                                                         | <b>141700</b>  | <b>16350</b>   |
| <b>Mine Closure Activity</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) |                                                                                                                                         | 37060          | 0              |
| <b>Green fund</b>                      | G.O.(Ms). No.23, Dated: 28.09.2021                                                                                                                                                                                                | Section IVA of TNMMCR 1959 (@10% of Seigniorage Fee)<br>(Seigniorage Fee for granite waste = Rs.3133 and for granite recovery = Rs.265) | 2349750        | 0              |
| <b>Total EMP Budget</b>                |                                                                                                                                                                                                                                   |                                                                                                                                         | <b>3900810</b> | <b>1073410</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><br/>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 EMP<br/>Cost</b> |
|--------------------------------|---------------------------------|----------------------------------|---------------------------------|--------------------------------|-------------------------------------|---------------------------|
| <b>1073410</b>                 | <b>1127081</b>                  | <b>1183435</b>                   | <b>1242606</b>                  | <b>1304737</b>                 | 5931269                             | 9832079                   |

In order to implement the environmental protection measures, an amount of **Rs. 3900810** as capital cost and **Rs. 1073410** 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 total recurring cost over 5 years is **Rs.5931269** and the overall EMP cost for 5 years will be **Rs.9832079**, as shown in Table 10.2.

### **10.3 CONCLUSION**

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



## CHAPTER XI

### SUMMARY AND CONCLUSION

#### 11.1 INTRODUCTION

As the proposed rough stone mining project (P1) falls within the quarry cluster of 500 m radius with the total extent of 15.10.0 ha, it requires submission of EIA report for grant of Environmental Clearance (EC) after conducting public hearing. The proposed project falling in S.F.No. 1160/1(P) over the extent of 1.09.0 ha is situated in the cluster falling in Irudukottai Village, Denkanikottai Taluk, Krishnagiri District, Tamil Nadu. The quarries involved in the calculation of cluster extent are one proposed quarries and five existing Quarries.

#### 11.2 PROJECT DESCRIPTION

The proposed project area is located between Latitudes from 12°25'38.1022"N to 12°25'43.1918"N Longitudes from 77°50'27.3805"E to 77°50'22.8344"E in Irudukottai Village, Denkanikottai Taluk, Krishnagiri District, Tamil Nadu. According to the approved mining plan, colour granite 30% recovery of about 7500m<sup>3</sup> and Granite waste 70% of 17500m<sup>3</sup> will be mined up to the depth of 6m BGL in the five years. The quarrying operation is proposed to be carried out by open cast manual mining method involving drilling and formation of benches of the prescribed dimensions.

#### 11.3 DESCRIPTION OF THE ENVIRONMENT

Baseline data were collected to evaluate the existing environmental condition in the core and buffer areas during **March – May 2024** as per CPCB guidelines. The data were collected by both the FAEs and NABL accredited and MoEF notified **Greenlink Analytical and Research Laboratory (India) Private Ltd** for the environmental attributes including soil, water, noise, air and by FAEs for ecology and biodiversity, traffic, and socio-economy.

##### 11.3.1 Land Environment

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

**Table.11.1 LULC Statistics of the Study Area**

| S. No. | Classification         | Extent (ha) | Area (%) |
|--------|------------------------|-------------|----------|
| 1      | Water                  | 10.91       | 0.13     |
| 2      | Trees                  | 1286.92     | 15.09    |
| 3      | Crops                  | 3222.86     | 37.78    |
| 4      | Built Area             | 324.53      | 3.80     |
| 5      | Mining/Industrial area | 73.04       | 0.86     |

|       |             |                |              |
|-------|-------------|----------------|--------------|
| 6     | Bare Ground | 2.47           | 0.03         |
| 7     | Rangeland   | 3609.99        | 42.32        |
| Total |             | <b>8530.72</b> | <b>100.0</b> |

### 11.3.2 Soil Environment

#### *Physical Characteristics*

The soil samples in the study area show loamy textures varying between silty clay loam, silty loam and sandy loam. pH of the soil varies from 6.4 to 7.9 indicating slightly acidic to slightly alkaline nature. Electrical conductivity of the soil varies from 43.85 to 133.2  $\mu\text{S}/\text{cm}$ . Potassium ranges between 1077 and 3056 %, Calcium ranges between 4455 and 21085 mg/kg. Organic matter content ranges between 0.17 and 0.71%.

### 11.3.3 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.

Four groundwater samples, known as BW1, BW2, BW3 and OW1 were collected from open well and bore well and analysed for physico-chemical conditions, heavy metals. Data regarding depth to groundwater levels are essential to infer the direction of groundwater movement within the study area. Knowledge of groundwater flow direction is must in choosing location for background groundwater quality monitoring well and in locating recharge and discharge areas. Therefore, data regarding groundwater elevations were collected from 9 open wells and 9 bore wells at various locations within 2 km radius around the proposed project sites for the period from March through May, 2024 (Pre-Monsoon Season) and from October through December, 2023 (Post Monsoon Season).

The open well water level data thus collected onsite are provided in Tables 3.7 and 3.8. According to the data, average depths to the static water table in open wells range from 21.77 to 24.57 m BGL in pre monsoon and 17.97 to 18.93 m BGL in post monsoon. The bore well data thus collected onsite are provided in Tables 3.9 and 3.10. The average depths to static potentiometric surface in bore wells for the period of October through December 2024 (Post-Monsoon Season) vary from 79.10 to 77.80 m and from 83.07 to 80.43 m for the period of March through May, 2025 (Pre-Monsoon Season). Data on the depths to static water table and potentiometric surface were used to draw contour lines connecting groundwater elevation (also known as equipotential hydraulic head) to determine the groundwater flow direction perpendicular to the contour lines.

From the maps of open well groundwater flow direction shown in Figures 3.8- 3.9, it is understood that most of the open well groundwater for the post- and pre-monsoon seasons flows towards the open well number 9 located in SE direction of the proposed project site. The groundwater flow maps in Figure 3.10-3.11 show that most of the bore well groundwater for the post- and pre-monsoon seasons flow towards the bore well number 8. It is located in East direction of the proposed project site. On the basis of the groundwater flow information, both open wells and bore wells mentioned above can be chosen for water quality monitoring purpose as the wells may get easily affected by the contaminants resulting from the mining activities of the sites in future.

#### **11.3.4 Air Environment**

As per the monitoring data, PM<sub>2.5</sub> ranges from 13.4 µg/m<sup>3</sup> to 15.8 µg/m<sup>3</sup>; PM<sub>10</sub> from 35.7 µg/m<sup>3</sup> to 42.2 µg/m<sup>3</sup>; SO<sub>2</sub> from 2.4 µg/m<sup>3</sup> to 4.2 µg/m<sup>3</sup>; NO<sub>x</sub> from 6.7 µg/m<sup>3</sup> to 11.5 g/m<sup>3</sup>. The concentration levels of the pollutants fall within the acceptable limits of NAAQS prescribed by CPCB.

#### **11.3.5 Noise Environment**

Noise level in core zone was 49.7dB (A) Leq during day time and 36.4dB (A) Leq during night time. Noise levels recorded in buffer zone during day time varied from 39.0 to 45.1 dB (A) Leq and during night time from 37.5 to 39.4 dB (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 in the quarry lease area, only shrubs, herbs and grasses. Taxonomically total of 28 species belonging to 16 families were recorded. Amongthem are herbs (23) and shrubs (5). Majority of the species belongs to the family of Fabaceae and Poaceae. The species richness (Margalef index) and plant details are given in Table 3.19-3.21. There are no endangered or threatened plant species in the quarry lease area.

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

The vegetation habit analysis indicates that the flora of the 300m radius of the study area consists of 60 species belonging to 31 families. Among the 60 species, 22 herbs, 24 shrubs and 14 trees. the highest number of species were from the Poaceae family (7), followed by Fabaceae (6), Malvaceae (4), and Mimosaceae (4). Three species were recorded from the Amaranthaceae, Apocynaceae, and Asteraceae families, while two species each were recorded from the Arecaceae, Boraginaceae, Convolvulaceae, Cucurbitaceae, Euphorbiaceae, and Lamiaceae families. The endangered or threatened and Species Richness (margalef Index) in the study area it mentioned in Table 3.19 - 3.21. The Velamundi Reserve Forest is located 172 meters north of the quarry lease area. The reserve forest is predominantly populated with *Albizia amara*, *Vachellia leucophloea*, *Vachellia karroo*, *Chloroxylon swietenia*, and *Ziziphus mauritiana*.

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

The faunal species observed in the study area are listed in Table 3.25. A total of 26 species were recorded in core zone of the project area. The core zone exhibited fewer species, with only a small number of insects, mammals, and reptiles, whereas the buffer zone showed greater species diversity. Among the 26 species recorded, the distribution was as follows: (10) insects, (03) reptiles, Avian and (04) mammals. These species were cross-checked against the IUCN Red List Database version 3.1 to identify any threatened species. Data analysis revealed that 21 species are categorized as Least Concern on the Red List, while 18 species were not listed. The analysis indicates that there are no REET species in the core zone of the proposed quarry site.

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

The faunal species observed in the study area are listed in Table 3.26. Taxonomically a total of 82 species belonging to 49 families have been recorded from the buffer zone area. Based on habitat classification the majority of species were Birds 50, followed by Insects 13, Reptiles 11, Mammals 5 and amphibians 3. There are 4 schedule II species and 28 schedule IV species according to Indian wild life Act 1972. Totally, 19 species of bird were sighted in the study area.

### **11.3.7 Socio Economic Environment**

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

## **11.4 ANTICIPATED ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES**

### **11.4.1 Land Environment**

#### **Anticipated Impact**

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

#### **Mitigation Measures**

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

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

### **11.4.2 Water Environment**

#### **Anticipated Impact**

- Surface and ground water resources may be contaminated due to pit water discharge, domestic sewage, discharge of oil and grease bearing waste water from washing of vehicles and machineries, and washouts from surface exposure or working areas
- As the proposed project acquires 3.0 KLD of water from water vendors, it will not extract water by developing abstraction structures in the lease area. Therefore, the project will not have impact on depletion of aquifer beneath the lease area.

#### **Mitigation Measures**

- Rain water from mine pit will be treated in settling tanks before being used for dust suppression and tree plantation purposes
- Domestic sewage from site office will be discharged in septic tank and then directed to soak pits
- Water from the tipper wash-down facility and machinery maintenance yard will be passed through interceptor traps/oil separators prior to its reuse

- The garland drainage will be connected to settling tank and sediments will be trapped in the settling tanks and only clear water will be discharged to the natural drainage
- Periodic (every 6 month once) analysis of ground water quality of quarry pit water and ground water of nearby villages will be conducted
- Artificial recharge structures will be established in suitable locations as part of the rainwater harvesting management program.

### **11.4.3 AIR ENVIRONMENT**

#### **Anticipated Impact**

Anticipated increase of the air pollutants due to quarrying activities have been predicted using AERMOD software. The values of cumulative concentration i.e., background + incremental concentration of pollutant in all the receptor locations are still within the prescribed NAAQ limits without effective mitigation measures. By adopting suitable mitigation measures, the pollutant levels in the atmosphere can be controlled further

#### **Mitigation Measures**

- To control dust at source, wet drilling will be practiced. Where there is a scarcity of water, suitably designed dust extractor will be provided for dry drilling along with dust hood at the mouth of the drill-hole collar
- Dust mask will be provided to the workers and their use will be strictly monitored
- Water will be sprinkled on haul roads twice a day to avoid dust generation during transportation
- Transportation of material will be carried out during day time and material will be covered with tarpaulin
- The speed of tippers plying on the haul road will be limited to < 20 km/hr to avoid generation of dust
- The un-metalled haul roads will be compacted weekly before being put into use
- It will be ensured that all transportation vehicles carry a valid PUC certificate
- Haul roads and service roads will be graded to clear accumulation of loose materials
- Planting of trees all along main mine haul roads and around the project site will be practiced to prevent the generation of dust
- Dust mask will be provided to the workers and their use will be strictly monitored

#### **11.4.4 Noise Environment**

##### ***Anticipated Impact***

Total noise level in all the sampling areas is well below the CPCB standards for industrial and residential areas.

##### ***Mitigation Measures***

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

#### **11.4.5 Biological Environment**

##### ***Anticipated Impact***

- During loading the truck, dust generation will be likely. This shall be a temporary effect and not anticipated to affect the surrounding vegetation significantly
- The Number of plants in the mining lease area is given in Chapter 3 which vegetation in the lease area may be removed during mining.
- Carbon released from quarrying machineries and tippers during quarrying would be 34 kg per day, 9065kg per year and 45326 kg over five years, as provided in Table 4.7.

##### ***Mitigation Measures***

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

- To mitigate carbon emission due to mining activities, we recommend planting trees around the quarry to offset the carbon emission during quarrying. A tree can sequester 13067 kg of carbon per year. Therefore, we recommend planting large number of trees around the quarry and near school campuses, government wasteland, roadsides etc.
- As per the greenbelt development plan as recommended by SEAC (Table 4.19), about 935 trees will be planted within three months from the beginning of mining. These trees, when grown up would sequester carbon of about 65335 kg of the total carbon, as provided in Table 4.8.

#### **11.4.6 Socio Economic Environment**

##### ***Anticipated Impact***

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

##### ***Mitigation Measures***

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

#### **11.4.7 Occupational Health**

- All the persons will undergo pre-employment and periodic medical examination
- Employees will be monitored for occupational diseases by conducting medical tests: General physical tests, Audiometric tests, Full chest, X-ray, Lung function tests, Spirometric tests, Periodic medical examination – yearly, Lung function test – yearly, those who are exposed to dust and Eye test



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

### 11.5 Environment Monitoring Program

**Table 11.2 Environment Monitoring Program**

| S. No. | Environment Attributes   | Location                                                                 | Monitoring     |                              | Parameters                                                                                  |
|--------|--------------------------|--------------------------------------------------------------------------|----------------|------------------------------|---------------------------------------------------------------------------------------------|
|        |                          |                                                                          | Duration       | Frequency                    |                                                                                             |
| 1      | Air Quality              | 2 Locations (1 Core & 1 Buffer)                                          | 24 hours       | Once in 6 months             | Fugitive Dust, PM <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 operation             | Peak particle velocity                                                                      |
| 7      | Soil                     | 2 Locations (1 Core & 1 Buffer)                                          | –              | Once in six months           | Physical and chemical characteristics                                                       |
| 8      | Greenbelt                | Within the project area                                                  | Daily          | Monthly                      | Maintenance                                                                                 |

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

## **11.6 ADDITIONAL STUDIES**

### **11.6.1 Risk Assessment**

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

### **11.6.2 Disaster Management Plan**

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

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

### **11.6.3 Cumulative Impact Study**

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

- The cumulative results of noise for the habitation in consideration do not exceed the limit set by CPCB for residential areas for day time
- PPV resulting from three proposed project is well below the permissible limit of Peak Particle Velocity of 5 mm/s
- The proposed projects will allocate Rs. 10,00,000/- towards CER as recommended by SEAC
- The proposed projects will directly provide jobs to 17 local people, in addition to indirect jobs
- The proposed projects will plant 433 about trees in and around the lease area
- The proposed projects will add 48 PCU per day to the nearby roads.

### 11.7 Project Benefits

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

- Direct employment to 17 local people
- Creation of community assets (infrastructure) like school buildings, village roads/ linked roads, dispensary & health Centre, community Centre, market place etc.,
- Strengthening of existing community facilities through the Community Development Program
- Skill development & capacity building like vocational training.
- Rs. 10,00,000 will be allocated for CER

### 11.8 ENVIRONMENT MANAGEMENT PLAN

In order to implement the environmental protection measures, an amount of **Rs. 3900810** as capital cost and **Rs. 1073410** 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 total recurring cost over 5 years is **Rs.5931269** and the overall EMP cost for 5 years will be **Rs.9832079**, as shown in Table 10.2.

## CHAPTER XII

### DISCLOSURES OF CONSULTANT

The Project Proponent, **M/s. Jayran Mines** 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 |
|---------------------------------------|--------------------|-------------------------------------|---------|-----------------|----------|
| Approved Functional Area Experts & EC |                    |                                     |         |                 |          |
| 1.                                    | Dr.S.Malar         | EIA Coordinator<br>(EC)<br>In-house | 1(a)(i) | Mining          | B        |
| 2.                                    | P.Vellaiyan        | In-house, FAE                       | 1(a)(i) | HG, GEO         | B        |
| 3.                                    | G. Prithiviraj     | In-house, FAE                       | 1(a)(i) | LU              | B        |
| 4.                                    | Dr.D.Kalaimurugan  | In-house, FAE                       | 1(a)(i) | SC, EB          | B        |
| 5.                                    | Dr.S.Malar         | In-house, FAE                       | 1(a)(i) | WP              | B        |
| 6.                                    | P. Venkatesh       | In-house, FAE                       | 1(a)(i) | AP, AQ          | B        |
| 7.                                    | C.Kumaresan        | In-house, FAE                       | 1(a)(i) | NV              | B        |
| 8.                                    | K. Udayakumar      | In-house, FAE                       | 1(a)(i) | SE              | B        |
| 9.                                    | J.N. Manikandan    | Empanelled FAE                      | 1(a)(i) | RH, SHW         | B        |
| Approved Functional Area Associates   |                    |                                     |         |                 |          |
| 10.                                   | C.Rahul            | FAA                                 | 1(a)(i) | GEO, LU         | B        |
| 11.                                   | K.Ravichandiran    | FAA                                 | 1(a)(i) | HG              | B        |
| 12.                                   | M.Kiruthika        | FAA                                 | 1(a)(i) | AQ              | B        |
| 13.                                   | V.Malavika         | FAA                                 | 1(a)(i) | NV, HW          | B        |
| Team Members                          |                    |                                     |         |                 |          |
| 14.                                   | G. Umamaheswaran   | In-house, FAE                       | 1(a)(i) | TM for EC       | B        |

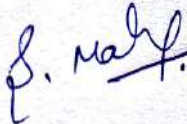
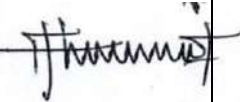
### **DECLARATION BY EXPERTS CONTRIBUTING TO THE EIA & EMP**

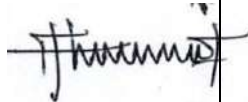
I, hereby, certify that I was a part of the EIA team in the following capacity that developed the EIA & EMP report.

Signature :  
Date :  
Name : **Dr. S. Malar**  
Designation : EIA Coordinator  
Name of the EIA Consultant Organization : Geo Technical Mining Solutions  
Period of Involvement : Till date

We, the FAEs and FAAs hereby declare that information furnished in this EIA/EMP report for **M/s. Jayran Mines**, Colour Granite quarry project with the extent of 1.09.0ha situated in the cluster with the extent of **15.10.0ha** in Irudukottai Village, Denkanikottai Taluk, Krishnagiri District and Tamil Nadu is true and correct to the best of our knowledge.

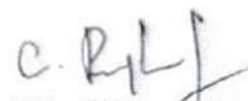
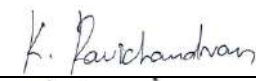
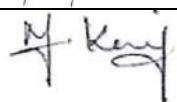
#### **List of Functional Area Experts Engaged in this Project**

| <b>S. No.</b> | <b>Functional Area</b> | <b>Involvement</b>                                                                                                                                                                                         | <b>Name of the Experts</b> | <b>Signature</b>                                                                      |
|---------------|------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------|---------------------------------------------------------------------------------------|
| 1             | AP                     | ○ Identification of different sources of air pollution due to the proposed mine activity                                                                                                                   | P. Venkatesh               |  |
|               |                        | ○ Prediction of air pollution and propose mitigation measures / control measures                                                                                                                           | J.N. Manikandan            |  |
| 2             | WP                     | ○ Suggesting water treatment systems, drainage facilities<br>○ Evaluating probable impacts of effluent/waste water discharges into the receiving environment/water bodies and suggesting control measures. | Dr.S.Malar                 |  |
| 3             | HG                     | ○ Interpretation of ground water table and predict impact and propose mitigation measures.<br>○ Analysis and description of aquifer Characteristics                                                        | P.Vellaiyan                |  |

|    |     |                                                                                                                                                                                                                                                                                                              |                       |                                                                                       |
|----|-----|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------|---------------------------------------------------------------------------------------|
| 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>                                        | P.Vellaiyan           |    |
| 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>                                                                                        | K.Udayakumar          |    |
| 6  | EB  | <ul style="list-style-type: none"> <li>Collection of Baseline data of Flora and Fauna.</li> <li>Identification of species labelled as Rare, Endangered and threatened as per IUCN list.</li> <li>Impact of the project on flora and fauna.</li> <li>Suggesting species for greenbelt development.</li> </ul> | Dr.<br>D.Kalaimurugan |    |
| 7  | RH  | <ul style="list-style-type: none"> <li>Identification of hazards and hazardous substances</li> <li>Risks and consequences analysis</li> <li>Vulnerability assessment</li> <li>Preparation of Emergency Preparedness Plan</li> <li>Management plan for safety.</li> </ul>                                     | J.N.<br>Manikandan    |  |
| 8  | LU  | <ul style="list-style-type: none"> <li>Construction of Land use Map</li> <li>Impact of project on surrounding land use</li> <li>Suggesting post closure sustainable land use and mitigative measures.</li> </ul>                                                                                             | G. Prithviraj         |  |
| 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>                                                                                                                                                  | C. Kumaresan          |  |
| 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>                                                                                                      | P. Venkatesh          |  |
| 11 | SC  | <ul style="list-style-type: none"> <li>Assessing the impact on soil environment and proposed mitigation measures for soil conservation</li> </ul>                                                                                                                                                            | Dr.<br>D.Kalaimurugan |  |

|    |     |                                                                                                                                                                                                                                                  |                 |                                                                                     |
|----|-----|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------|-------------------------------------------------------------------------------------|
| 12 | SHW | <ul style="list-style-type: none"> <li>○ Identify source of generation of non-hazardous solid waste and hazardous waste.</li> <li>○ Suggesting measures for minimization of generation of waste and how it can be reused or recycled.</li> </ul> | J.N. Manikandan |  |
|----|-----|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------|-------------------------------------------------------------------------------------|

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

| S.No. | Name            | Functional Area | Involvement                                                                                                                                                | Signature                                                                           |
|-------|-----------------|-----------------|------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| 1     | C.Rahul         | GEO, LU         | <ul style="list-style-type: none"> <li>○ Site visit with FAE</li> <li>○ Provide inputs &amp; Assisting FAE for LU</li> </ul>                               |  |
| 2     | K.Ravichandiran | HG              | <ul style="list-style-type: none"> <li>○ Site visit with FAE</li> <li>○ Provide inputs &amp; Assisting FAE for HG</li> </ul>                               |  |
| 3     | M.Kiruthika     | AQ              | <ul style="list-style-type: none"> <li>○ Field visits along with FAE</li> <li>○ Assistance to FAE in both primary and secondary data collection</li> </ul> |  |
| 4     | V. Malavika     | NV, SHW         | <ul style="list-style-type: none"> <li>○ Site visit along with FAE</li> <li>○ Assistance in report preparation</li> </ul>                                  |  |

**DECLARATION BY THE HEAD OF THE ACCREDITED CONSULTANT**

**ORGANIZATION**

I, **Dr. S. KARUPPANNAN**, Managing Partner, **Geo Technical Mining Solutions**, hereby, confirm that the above-mentioned functional area experts and team members prepared the EIA/EMP report for **M/s. Jayran Mines**, Colour Granite quarry project with the extent of **1.09.0ha** situated in the cluster with the extent of **15.10.0ha** in Irudukottai Village, Denkanikottai Taluk, Krishnagiri 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: 11945**  
**Government of India**  
**Ministry of Environment, Forest and Climate Change**  
**(Issued by the State Environment Impact Assessment Authority(SEIAA),**  
**TAMIL NADU)**

\*\*\*



Annexure - I

Dated 13/05/2025



To,

Thiru.Jayaprakash  
M/s.Jayran Mines  
D.No.HIG-301,New Temple Land Hudco,Rajaji Road, Hosur Taluk,Krishnagiri District,TAMIL  
NADU -635109.  
jayranmines@gmail.com

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

**Sir/Madam,**

SEIAA, Tamil Nadu – Terms of Reference along with Public Hearing (ToR) for the Proposed Colour Granite Quarry of S.F. No: 1160/1 (Part) over an area of 1.09.0 Ha in Irudhukottai Village, Denkanikottai Taluk, Krishnagiri District, Tamil Nadu by M/s. Jayran Mines - under project category – “B1” and Schedule S.No.1(a) – ToR issued along with Public Hearing- preparation of EIA report – Regarding.

**Ref:**

1. Online proposal No. SIA/TN/MIN/528897/2025, Dated: 11/03/2025.
2. Your application submitted for Terms of Reference dated: 13.03.2025.
3. Minutes of the 542th Meeting of SEAC held on 26.03.2025.
4. Minutes of the 817th Meeting of Authority held on 07.05.2025.

2. The particulars of the proposal are as below :

|                                                   |                                            |
|---------------------------------------------------|--------------------------------------------|
| <b>(i) TOR Identification No.</b>                 | TO25B0108TN5108832N                        |
| <b>(ii) File No.</b>                              | 11945                                      |
| <b>(iii) Clearance Type</b>                       | TOR                                        |
| <b>(iv) Category</b>                              | B1                                         |
| <b>(v) Project/Activity Included Schedule No.</b> | 1(a) Mining of minerals                    |
| <b>(vii) Name of Project</b>                      | Irudhukottai Village Colour Granite Quarry |
| <b>(viii) Name of Company/Organization</b>        | JAYRAN MINES                               |
| <b>(ix) Location of Project (District, State)</b> | KRISHNAGIRI, TAMIL NADU                    |
| <b>(x) Issuing Authority</b>                      | SEIAA                                      |
| <b>(xii) Applicability of General Conditions</b>  | 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 22.04.2025. 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 by M/s. Jayran Mines 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 Secretary, Ministry of Mines, Government of India, Shastri Bhawan, New Delhi.
2. The Principal Secretary to Government, Environment and Forests Department, Tamil Nadu.
3. The Additional Chief Secretary to Government, Natural Resources Department, Tamil Nadu.
4. The Additional Principal Chief Conservator of Forests, Regional Office (SZ), 34, HEPC Building, 1st & 2nd Floor, Cathedral Garden Road, Nungambakkam, Chennai – 34.
5. The Chairman, Central Pollution Control Board, Parivesh Bhawan, CBD-Cum-Office Complex, East Arjun Nagar, New Delhi-110 032.
6. The Chair Person, TNPC Board, 76, Mount Salai, Guindy, Chennai-32
7. The District Collector, Krishnagiri District.
8. The Commissioner of Geology and Mines, Guindy, Chennai-32
9. Assistant Director, Department of Geology & Mining, Krishnagiri District
10. EI Division, Ministry of Environment & Forests, Paryavaran Bhawan, New Delhi.
11. File Copy.

#### **Annexure 1**

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

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

| S. No | Terms of Reference                                                                                                                                                                                                                                                                            |
|-------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1.1   | 1. The Project Proponent shall furnish the revised EMP based on the study carried out on impact of the dust & other environmental impacts due to proposed quarrying operations on the nearby agricultural lands for the life of the mine in the format prescribed by the SEAC considering the |

| S. No | Terms of Reference                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
|-------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|       | <p>cluster situation.</p> <p>2. The PP is requested to revise the Mining plan because the school and village is located within 300m radius from the project site.</p> <p>3. The PP shall submit the slope stability action plan incorporating the methodology of working in the remaining depth by maintaining the benches of adequate bench geometry in the hilly terrain (above ground level) along with a conceptual working plan for maintaining the safety aspects within the lease.</p> <p>4. The PP shall undertake Hydrogeology study considering nearby existing wells, Aquifers, Ground water &amp; surface water levels etc., within the radius of 1km.</p> <p>5. The study on impact of the proposed quarrying operations on the surrounding environment which includes water bodies, Odai etc., shall be furnished.</p> |

## 2. Seac Standard Conditions

| S. No | Terms of Reference                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
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| 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> <ul style="list-style-type: none"> <li>(i) Original pit dimension</li> <li>(ii) Quantity achieved Vs EC Approved Quantity</li> <li>(iii) Balance Quantity as per Mineable Reserve calculated.</li> <li>(iv) Mined out Depth as on date Vs EC Permitted depth</li> <li>(v) Details of illegal/illicit mining</li> <li>(vi) Violation in the quarry during the past working.</li> <li>(vii) Quantity of material mined out outside the mine lease area</li> <li>(viii) Condition of Safety zone/benches</li> <li>(ix) Revised/Modified Mining Plan showing the benches of not exceeding 6 m height and ultimate depth of not exceeding 50m.</li> </ul> <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 status of the quarry wall and possible mitigation measures during the time of appraisal for obtaining the EC.</p> |

| S. No | Terms of Reference                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
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|       | <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.</p> <ul style="list-style-type: none"> <li>· Highest production achieved in any one year</li> <li>· Detail of approved depth of mining.</li> <li>· Actual depth of the mining achieved earlier.</li> <li>· Name of the person already mined in that leases area.</li> <li>· If EC and CTO already obtained, the copy of the same shall be submitted.</li> <li>· Whether the mining was carried out as per the approved mine plan (or EC if issued) with stipulated benches.</li> </ul> <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> <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,</p> |

| S. No | Terms of Reference                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
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|       | <p>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 along with budgetary allocations.</p> <p>38. The Socio-economic studies should be carried out within a 5 km buffer zone from the mining</p> |



| S. No | Terms of Reference                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
|-------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|       | <p>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 Standard Conditions:

| S. No | Terms of Reference                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
|-------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 3.1   | <p><b><u>Cluster Management Committee</u></b></p> <ol style="list-style-type: none"> <li>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.</li> <li>The members must coordinate among themselves for the effective implementation of EMP as committed including Green Belt Development, Water sprinkling, tree plantation, blasting etc.,</li> <li>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.</li> <li>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.</li> <li>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.</li> <li>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.</li> <li>The committee shall furnish action plan regarding the restoration strategy with respect to the individual quarry falling under the cluster in a holistic manner.</li> <li>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.</li> </ol> <p><b><u>Agriculture &amp; Agro-Biodiversity</u></b></p> <ol style="list-style-type: none"> <li>Impact on surrounding agricultural fields around the proposed mining Area.</li> <li>Impact on soil flora &amp; vegetation around the project site.</li> <li>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.</li> <li>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</li> </ol> |

| S. No | Terms of Reference                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
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|       | <p>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> <ol style="list-style-type: none"> <li>Hydrothermal/Geothermal effect due to destruction in the Environment.</li> <li>Bio-geochemical processes and its foot prints including Environmental stress.</li> <li>Sediment geochemistry in the surface streams.</li> </ol> <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> |

| S. No | Terms of Reference                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
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|       | <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                                                                                                                                                                                                                                                                                                                    |
|-------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 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 |
| 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 areashould 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)          |

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

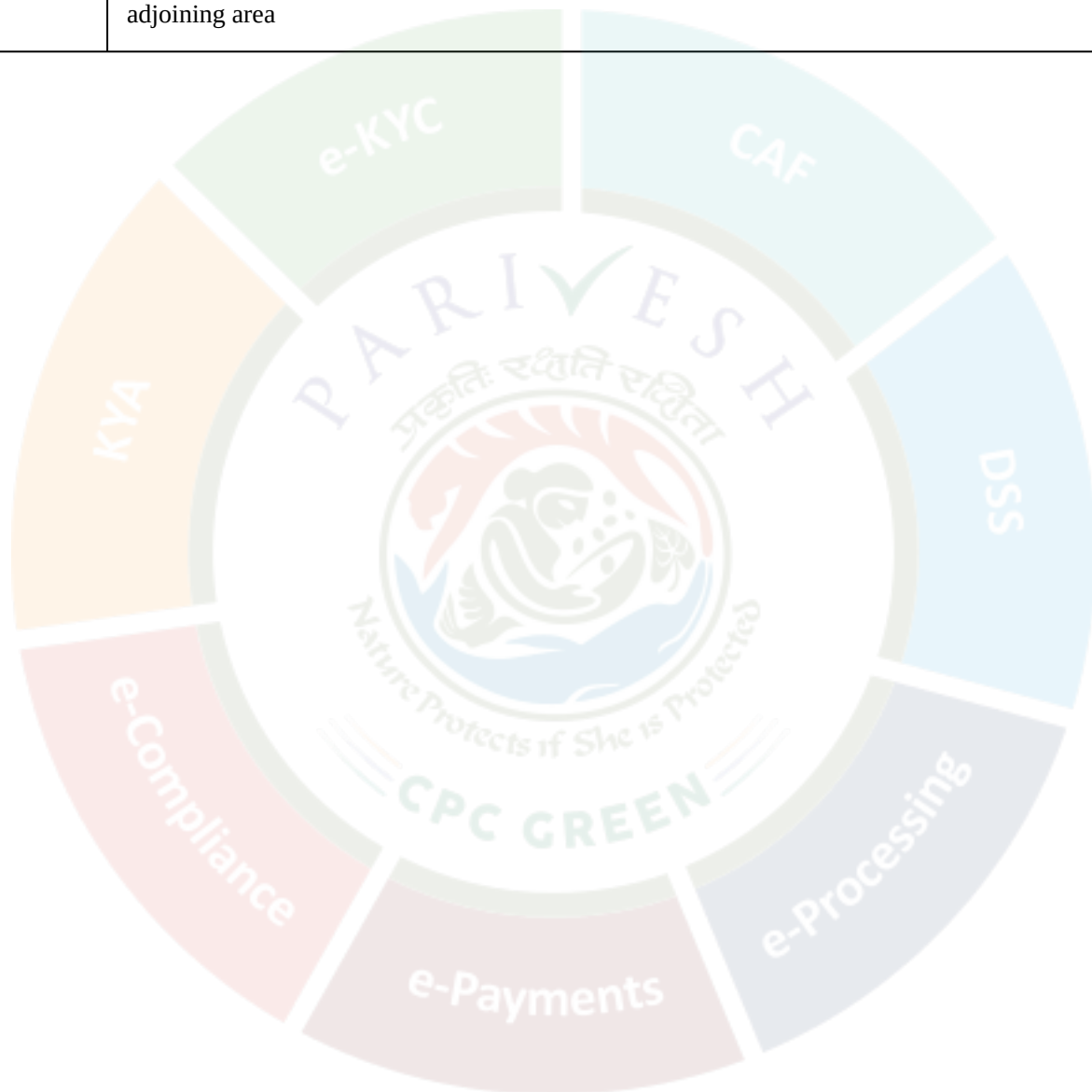


| S. No | Terms of Reference                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
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| 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 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 |

| S. No | Terms of Reference                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
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| 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 (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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |

| S. No | Terms of Reference                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
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|       | 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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| 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  | 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&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&CC with reasons for such changes and permission |

| S. No | Terms of Reference                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
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|       | <p>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> |





## **A. STANDARD TERMS OF REFERENCE**

- 1) Year-wise production details since 1994 should be given, clearly stating the highest production achieved in any one year prior to 1994. It may also be categorically informed whether there had been any increase in production after the EIA Notification 1994 came into force, w.r.t. the highest production achieved prior to 1994.
- 2) A copy of the document in support of the fact that the Proponent is the rightful lessee of the mine should be given.
- 3) All documents including approved mine plan, EIA and Public Hearing should be compatible with one another in terms of the mine lease area, production levels, waste generation and its management, mining technology etc. and should be in the name of the lessee.
- 4) All corner coordinates of the mine lease area, superimposed on a High-Resolution Imagery/ topo sheet, topographic sheet, geomorphology and geology of the area should be provided. Such an Imagery of the proposed area should clearly show the land use and other ecological features of the study area (core and buffer zone).
- 5) Information should be provided in Survey of India Topo sheet in 1:50,000 scale indicating geological map of the area, geomorphology of land forms of the area, existing minerals and mining history of the area, important water bodies, streams and rivers and soil characteristics.
- 6) Details about the land proposed for mining activities should be given with information as to whether mining conforms to the land use policy of the State; land diversion for mining should have approval from State land use board or the concerned authority.
- 7) It should be clearly stated whether the proponent Company has a well laid down Environment Policy approved by its Board of Directors? If so, it may be spelt out in the EIA Report with description of the prescribed operating process/procedures to bring into focus any infringement/deviation/ violation of the environmental or forest norms/ conditions? The hierarchical system or administrative order of the Company to deal with the environmental issues and for ensuring compliance with the EC conditions may also be given. The system of reporting of non-compliances / violations of environmental norms to the Board of Directors of the Company and/or shareholders or stakeholders at large, may also be detailed in the EIA 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 PM<sub>10</sub>, 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

From

Dr. P.Jayapal, M.Sc.,Ph.d.,  
Deputy Director,  
Dept of Geology and Mining,  
Krishnagiri.

To

M/s. Jayran Mines,  
D.No. HIG-301, New Temple Land,  
Hudco, Rajaji Road, Hosur Taluk,  
Krishnagiri - 635 109.

**Roc.No.1055/2020 /Mines dated: 11.04.2025.**

Sir,

**Sub:** Mines and Minerals – Colour Granite – Krishnagiri District - Denkanikottai Taluk – Irudhukottai Village in Govt land in S.F.No. 1160/1(P) – Over an extent of 1.09.00 Hect - Tender Cum Auction conducted – M/s. Jayran Mines declared as highest bidder - Mining Plan approved by the Commissioner of Geology & Mining, Chennai – Applied for obtaining Environmental Clearance From SEIAA - Details of quarries situated in 500 mtrs radial distance from the proposed quarry site -requested – furnished.

- Ref:**
1. The District Collector, Krishnagiri file Rc. No. 1055/2020/Mines dated 20.11.2020.
  2. Mining plan approved the Commissioner of Geology and Mining, Chennai in Lr. Rc. No. 6946/MM4/2020 dated: 19.04.2023.
  3. M/s. Jayran Mines, letter dated: 26.02.2025.

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Kind attention is invited to the reference cited.

2) A Quarry lease had been proposed by M/s. Jayran Mines for quarrying Colour Granite over an extent of 1.09.00 Hects in Govt. lands in S.F.No. 81160/1(P) in Irudhukottai Village, Denkanikottai Taluk, Krishnagiri District for a period of 20 years under the provisions of Rule 8-A of Tamil Nadu Minor Mineral Concession Rules 1959.



3. In this regard, The commissioner of Geology & Mining vide reference 2<sup>nd</sup> cited has accorded approval for Mining Plan in respect of the said quarry lease.

4. M/s. Jayran Mines vide reference 3<sup>rd</sup> cited has requested the details of quarries situated within 500mts for the subject quarry vide letter dated: 26.02.2025 for obtaining consent from the TNPCB.

5. As requested by the applicant, the details of quarries situated within 500m radial distance from the proposed quarry site is furnished as detailed below:

#### I. Details of Existing quarries.

| Sl. No | Name of the Lessee and address                                                                          | GO No & Date                                          | Taluk & Village                              | S.F. No.                                                                                         | Extent in Hectares                            | Period of lease                | Last permit date |
|--------|---------------------------------------------------------------------------------------------------------|-------------------------------------------------------|----------------------------------------------|--------------------------------------------------------------------------------------------------|-----------------------------------------------|--------------------------------|------------------|
| 1.     | M/s.Aryan Stones (P) Ltd,<br>No.12 Road, 3<br>Jigini Industrial Area, Anekal Taluk, Bangalore District. | GO.(3D)No.34<br>Ind(MME-2) Dept<br>Dated:09.06.2008   | Denkanikottai Taluk/<br>Irudhukottai Village | 1161/8,<br>1167/6                                                                                | 1.40.0                                        | 30.07.2008<br>to<br>29.07.2028 | 26.08.2016       |
| 2      | M/s.Aryan Stones (P) Ltd,<br>No.12 Road, 3<br>Jigini Industrial Area, Anekal Taluk, Bangalore District. | GO.(3D) No.35<br>Ind(MME-2) Dept<br>Dated:09.06.2008  | Denkanikottai Taluk/<br>Irudhukottai Village | 1158/3,<br>1158/6                                                                                | 1.40.0                                        | 30.07.2008<br>to<br>29.07.2028 | 26.08.2016       |
| 3      | Tvl.Vaigai Granites,<br>No.23 Ponni Nagar,<br>Bye Pass Road,<br>Madurai - 625 010.                      | GO.(3D) No.18<br>Ind(MME-2) Dept<br>Dated:31.10.2013  | Denkanikottai Taluk/<br>Irudhukottai Village | 1155/1,<br>1156/3(P)<br>1156/5                                                                   | 0.16.0<br>0.81.0<br>0.47.5<br>.....<br>1.44.5 | 15.12.2013<br>to<br>14.12.2033 | 26.10.2016       |
| 4.     | Thiru D.<br>Mathazhagan,<br>S/o K.M. Devaraj,<br>58-B Gandhi Nagar,<br>Krishnagiri 635 001              | G.O (3D) No. 20<br>Ind (MME-2) Dept.<br>dt 2.02.2016. | Denkanikottai Taluk/<br>Irudhukottai Village | 1158/4<br>1158/5<br>1162/1<br>1162/2<br>1162/3<br>1162/4<br>1162/5<br>1163/6<br>1163/7<br>1165/1 | 6.55.0                                        | 03.3.2016<br>to<br>02.3.2036   | 07.01.2025       |

|    |                                                                                                                                                 |                                                       |                                                    |                                                                                                              |        |                                |            |
|----|-------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------|----------------------------------------------------|--------------------------------------------------------------------------------------------------------------|--------|--------------------------------|------------|
| 5. | Thiru V.<br>Jayaprakash,<br>S/o Venkatesh,<br>No. 301, HIG,<br>Phase 10, New<br>Temple Land,<br>HUDCO,<br>Rayakottai Road,<br>Hosur, rishnagiri | G.O (3D) No. 29<br>Ind (MME-2) Dept<br>dt 29.10.2015. | Denkanikottai<br>Taluk/<br>Irudhukottai<br>Village | 1158/8<br>1158/9,<br>1160/3A<br>1160/4<br>1161/2<br>(p)<br>1161/3 (),<br>1161/4A<br>(P) and<br>1166/5<br>(p) | 3.21.5 | 18.11.2015<br>to<br>17.11.2035 | 17.02.2025 |
|----|-------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------|----------------------------------------------------|--------------------------------------------------------------------------------------------------------------|--------|--------------------------------|------------|

## II. Details of abandoned/Old quarries.

| Sl. No. | Name of the lessee | GO.No. & Dated | Village & Taluk | S.F No. | Extent in Hect | Lease period. |
|---------|--------------------|----------------|-----------------|---------|----------------|---------------|
| 1       | ----- Nil -----    |                |                 |         |                |               |

## III. Details of other Proposed/applied quarries

| Sl. No. | Name of the lessee                                                                                                     | Village & Taluk                                      | S.F No.   | Extent in Hect | GO No & Date | Lease period.       |
|---------|------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------|-----------|----------------|--------------|---------------------|
| 1       | M/s. Jayran Mines,<br>D.No.HIG-301,<br>New Temple Land<br>Hudco, Rajaji Road,<br>Hosur Taluk,<br>Krishnagiri District. | Denkanikottai<br>Taluk /<br>Irudhukottai<br>Village. | 1160/1(P) | 1.09.0         | ---          | Instant<br>Proposal |

*[Signature]*  
Deputy Director,  
Dept of Geology and Mining,  
Krishnagiri.

**Copy to :-**

The Chairman, Tamil Nadu State Environment  
Impact Assessment Authority,  
3<sup>rd</sup> Floor, Panakal Maligai,  
No. 1 Jeenes Road, Saidapet,  
Chennai -15.



# COMMISSIONERATE OF GEOLOGY AND MINING

From  
Thiru J. Jayakanthan, I.A.S.,  
Commissioner  
Commissionerate of Geology and Mining,  
Industrial Estate,  
Guindy,  
Chennai - 600 032.

To  
M/s. JAYRAN MINES,  
D.No.HIG-301,  
New Temple land Hudco,  
Rajaji Road, Hosur taluk,  
Krishnagiri district 635 109.

Rc.No. 6946/MM4/2020 Dated 19.04.2023

Sir,

Sub: Mines and Minerals - Minor Mineral - Granite -  
Krishnagiri district - Tender Cum Auction for Granite  
quarries conducted under the provisions of rule 8-A of  
TNMMCR 1959 on 07.11.2020 - Colour Granite quarry  
area over an extent of 1.09.00 ha of Government land in  
S.F.No. 1160/1(P) of Irudhukottai village, Denkanikottai  
taluk, Krishnagiri district - Precise area communicated to  
the highest bidder M/s. Jayran Mines- Draft Mining Plan  
submitted by the applicant firm for approval - Forwarded  
by the Deputy Director, Geology and Mining, Krishnagiri-  
Approved accorded -Reg.

- Ref:
1. Krishnagiri District Gazette Extraordinary issue in  
English No.20, 38 and Tamil No.35, 53 dated:  
09.10.2020 and 29.10.2020.
  2. Application of the M/s. Jayran Mines, HIG-301,  
New Temple land, Hudco, Hosur, Krishnagiri  
District dated: 07.11.2020 and two others.
  3. The District Collector, Krishnagiri, Roc.  
No.1055/2020/Mines, dated: 20.11.2020.
  4. The Principal Secretary to Government, Industries  
(MME.2) Department, Secretariat, Chennai - 600009  
Lr.No.898/ MME.2/2021-1, dated: 26.02.2021.
  5. Draft Mining Plan Submitted by M/s. Jayran Mines,  
HIG-301, New Temple land, Hudco, Hosur,  
Krishnagiri District dated: 03.05.2021.
  6. Writ Petition filed by Thiru.A. Chellakumar before  
Hon'ble High Court Madras in W.P.No. 16060/2020.
  7. Writ Petition filed by Thiru.R. Thamaraiselvan before  
Hon'ble High Court Madras in W.P.No. 13811/2020

8. The District Collector, Krishnagiri ·Lr. Rc.No. 1055/2020/Mines dated: 02.07.2021.
9. The Commissioner of Geology and Mining, Chennai Lr.Rc.No.3256/MM4/2022 dated: 05.01.2023.
10. The Deputy Director, Geology and Mining, Krishnagiri letter Rc.No.1055/2020/Mines dated 28.02.2023.

Kind attention is invited to the above references.

2) The applicant firm M/s. Jayron Mines vide reference 5<sup>th</sup> cited had submitted the draft mining plan to district office on 07.05.2021 for quarrying colour granite situated over an extent of 1.09.0 ha of Government land in S.F.No. 1160/1(P) of Irudhukottai village, Denkanikottai taluk and Krishnagiri district.

3) The Deputy Director (G&M), Krishnagiri has forwarded the mining plan submitted by the applicant firm M/s. Jayron Mines and reported as follows.,

- i. Tender Cum Auction was conducted in Krishnagiri district on 07.11.2020 for Colour granite quarry area situated over an extent of 1.09.00 ha of Government land in S.F.No. 1160/1(P) of Irudhukottai village, Denkanikottai taluk and Krishnagiri District.
- ii. M/s. Jayran Mines, had offered a highest bid/tender amount of Rs.1,37,00,000/- as one time lease amount. Hence necessary proposals had been forwarded by the District Collector, Krishnagiri to the Government through the Commissioner of Geology and Mining, Chennai for grant of Colour granite quarry lease infavour of the highest bidder M/s. Jayran Mines over the subject area for a period of 20 years vide letter dated: 20.11.2020.
- iii. The Government after detailed examination has issued precise area vide letter dated 26.02.2021 for the proposed grant of Colour granite quarry lease infavour of the highest bidder over an extent of 1.09.00 ha in Government land in S.F.No. 1160/1(P) of Irudhukottai village, Denkanikottai Taluk, Krishnagiri District and directed the highest bidder M/s. Jayran Mines to remit the balance amount of Rs. 1,12,00,000/- (Rupees One crore Twelve lakhs only) within one month from the date of receipt of the communication after deducting





- the EMD of Rs. 25,00,000/- already remitted by the applicant firm and directed to submit the approved mining plan and Environment Clearance.
- iv. M/s. Jayran Mines, have stated vide letter dated:23.03.2021 that they had received the precise area communication letter from Government and had submitted the balance amount for Rs. 1,12,00,000/- through the challan no. 63 dated: 23.03.2021 to this office and the same had been remitted to the Govt.
- v. In response to the Government letter, the applicant firm had submitted 5 copies of draft mining plan duly prepared by the qualified person for approval and resubmitted the mining plan on 03.05.2021 after carried out corrections with a request to grant additional time for the submission of mining plan due to covid-19 pandemic and lockdown in the entire country.
- vi. The representation was forwarded by the District Collector, Krishnagiri vide letter dated: 02.07.2021 and the orders from the Government is awaited.
- vii. Further, the Commissioner of Geology and Mining, Chennai vide letter dated 05.01.2023 has instructed to forward all the pending mining plans and scheme of mining plan to the Commissioner of Geology and Mining immediately for taking further action.
- viii. The draft mining plan submitted by the applicant firm have been verified by the Assistant Geologist (Mines) with reference to field conditions. The draft Mining Plan has been prepared by the Qualified person. The details such as Geological Reserves, Mineable Reserves, Year wise production and Development programme have been incorporated in the draft Mining Plan. The Special conditions imposed in the precise area communication are also incorporated in the draft mining plan.
- ix. The year wise production quantity mention in the mining plan is given as detailed below.



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| Year                 | Rom<br>(m <sup>3</sup> ) | Recovery<br>@ 30 %<br>(m <sup>3</sup> ) | Granite<br>Waste @ 70<br>% (m <sup>3</sup> ) | Top Soil in<br>(m <sup>3</sup> ) | Total Waste<br>in (m <sup>3</sup> ) |
|----------------------|--------------------------|-----------------------------------------|----------------------------------------------|----------------------------------|-------------------------------------|
| 1 <sup>st</sup> Year | 5000                     | 1500                                    | 3500                                         | 1296                             | 4796                                |
| 2 <sup>nd</sup> year | 5000                     | 1500                                    | 3500                                         | 1080                             | 4580                                |
| 3 <sup>rd</sup> year | 5000                     | 1500                                    | 3500                                         | 1080                             | 4580                                |
| 4 <sup>th</sup> year | 5000                     | 1500                                    | 3500                                         | 1080                             | 4580                                |
| 5 <sup>th</sup> year | 5000                     | 1500                                    | 3500                                         | 1080                             | 4580                                |
| <b>Total</b>         | <b>25000</b>             | <b>7500</b>                             | <b>17500</b>                                 | <b>5616</b>                      | <b>23116</b>                        |

x. Further, other quarries situated within 500 mts radial distance are as follows.

| Sl. No | Name of the Lessee and address                                                                 | Mineral        | GO No & Date                                    | Taluk & Village                     | S.F.No& Extent                            | Period of lease                       |
|--------|------------------------------------------------------------------------------------------------|----------------|-------------------------------------------------|-------------------------------------|-------------------------------------------|---------------------------------------|
| 1      | M/s. Jayran Mines, D.No. HIG 301, New Temple Land Hudco, Rajaji Road, Hosur Taluk, Krishnagiri | Colour Granite | Re.no. 1055/2020/ Mines                         | Irudhukottai Village, Denkanikottai | 1160/1 (P) 1.09.00hects                   | Instant Proposal (Precise area given) |
| 2.     | M/S. Aryan Stones (p) Ltd, No. 12, Road 3, Jigini Industrial Area, Anekal Taluk, Bangalore     | Colour Granite | GO (3D) No. 34 Ind.(MME-2) Dept. Dt. 9.6.2008   | Irudhukottai Village, Denkanikottai | 1161/8 1167/6 1.40.0 hecets               | 30.7.2008 to 29.7.2028                |
| 3.     | M/S. Aryan Stones (p) Ltd, No. 12, Road 3, Jigini Industrial Area, Anekal Taluk, Bangalore     | Colour Granite | GO (3D) No. 35 Ind.(MME-2) Dept. Dt. 9.6.2008   | Irudhukottai Village, Denkanikottai | 1158/3, 1158/6 1.40.0 hecets              | 30.7.2008 to 29.7.2028                |
| 4.     | Tvl. Vaigai Granites, No 23, Ponni Nagar, Bye Pass Road, Madurai                               | Colour Granite | GO (3D) No. 18 Ind.(MME-2) Dept. Dt. 31.10.2013 | Irudhukottai Village, Denkanikottai | 1155/1 1156/3 (P) 1156/5 1.44.50 hecets   | 15.12.2013 to 14.12.2033              |
| 5.     | Thiru D. Mathazhagan, S/o K.M. Devaraj, 58-B Gandhi Nagar,                                     | Colour Granite | G.O (3D) No. 20 Ind (MME-2) Dept. dt 2.02.2016. | Irudhukottai Village, Denkanikottai | 1158/4 1158/5 1162/1 1162/2 1162/3 1162/4 | 03.03.2016 to 02.03.2036              |



|    |                                                                                                                                                  |                   |                                                                |                                           |                                                                                                                         |                                        |
|----|--------------------------------------------------------------------------------------------------------------------------------------------------|-------------------|----------------------------------------------------------------|-------------------------------------------|-------------------------------------------------------------------------------------------------------------------------|----------------------------------------|
|    | Krishnagiri<br>635 001                                                                                                                           |                   |                                                                |                                           | 1162/5<br>1163/6<br>1163/7<br>1165/1<br>6.55.0 hecets                                                                   |                                        |
| 6. | Thiru V.<br>Jayaprakash,<br>S/o Venkatesh,<br>No. 301, HIG,<br>Phase 10, New<br>Temple Land,<br>HUDCO,<br>Rayakottai Road,<br>Hosur, Krishnagiri | Colour<br>Granite | G.O (3D) No.<br>29 Ind<br>(MME-2)<br>Dept<br>dt<br>29.10.2015. | Irudhukottai<br>Village,<br>Denkanikottai | 1158/8<br>1158/9,<br>1160/3A<br>1160/4<br>1161/2 (p)<br>1161/3 (),<br>1161/4A (P)<br>and 1166/5<br>(p) 3.21.5<br>hecets | 18.11.20<br>15<br>to<br>17.11.20<br>35 |

- xi. The Mining Plan has been prepared by the Qualified Person. The details such as Geological Reserves, Mineable Reserves, Year wise production and Development programme have been incorporated in the Mining plan. The Special conditions imposed in the precise area communication are incorporated in the mining plan.
- xii. There are no archeological monuments within 300 m radial distance and no Wildlife Sanctuary within 1.00 km radial distance.
- xiii. Hence, the Deputy Director (G&M), Krishnagiri has forwarded the Mining Plan submitted by the applicant firm M/s. Jayran Mines in respect of Govt land S.F.No. 1160/1(P) of Irudhukottai Village for approval, subject to the condition that,
- A safety distance of 7.5meters should be provided to the adjacent patta lands and should not cause any hindrance to them while quarrying and transportation.
  - A safety distance of 10meters should be provided to the Government Poramboke lands in S.F.no. 1160/1(P) on the north side of the lease area.

Finally, the Deputy Director (G&M), Krishnagiri has forwarded the Mining Plan submitted by the applicant firm M/s. Jayran Mines to the Commissioner of Geology and Mining for approval under Rule 12 of Granite Conservation and Development Rules-1999.

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4) The mining plan is in accordance with the precise area communicated for grant of lease. Based on the report of the Deputy Director (G&M), Krishnagiri district, the Mining plan submitted by M/s. Jayron Mines is hereby approved subject to the following conditions in addition to the conditions stipulated in the precise area communication issued by the Government:

- i. A safety distance of 7.5meters should be provided to the adjacent patta lands and should not cause any hindrance to them while quarrying and transportation.
- ii. A safety distance of 10meters should be provided to the Government Poramboke lands in S.F.no. 1160/1(P) on the north side of the lease area.
- iii. The applicant firm should obtain prior environmental clearance from the competent authority
- iv. The applicant firm should obey the final orders if any to be passed by the Hon' ble High Court of Madras in connection with the pending writ petitions filed against the Tender Cum Auction conducted for the grant of quarry leases in Govt land in respect of Granite.
- v. This mining plan is approved without prejudice to any other Law applicable to the quarry lease from time to time whether such Laws are made by the Central Government, State Government or any other authority.
- vi. The approval of the mining plan does not in any way imply the approval of the Government in terms of any other provisions of the Mines and Minerals (Development and Regulation) Act 1957, or any other connected laws including Forest (Conservation) Act, 1980, Forest Conservation Rules, 1981, Environment Protection Act, 1980' Indian Explosives Act, 1884 (Central Act IV of 1884) and the rules made there under and the Tamil Nadu Minor Mineral Concession Rules, 1959.



- vii. This mining plan including Progressive mine closure plan is approved without prejudice to any other order or direction from any court of competent jurisdiction.
- viii. Provisions of the Mines Act, 1952 and the Rules and Regulations made there under including submission of notice of opening, appointment of manager and other statutory officials as required under Mines Act, 1952 shall be complied with.
- ix. Provisions made under Mines and Minerals (Development & Regulation) Act, 1957, MMDR Amendment Act, 2015 and Granite conservation and Development Rules, 1999 made there under shall be complied with.
- x. The applicant firm should provide 7.5 m safety distance to the adjacent patta lands and 10 m safety distance to the adjacent poramboke lands in all the sides.
- xi. Granite waste materials should be dumped within the quarry lease area and should not be dumped outside the boundary of the lease area.
- xii. No hindrance should be caused to the adjacent pattadars and public while quarrying and transportation of minerals from the subject area.
- xiii. Environmental Clearance should be obtained from the authority in respect of the subject area as per rule 42 of the Tamil Nadu Minor Mineral Concession Rules, 1959 and as per the notification of the Ministry of Environment and Forest and any other clearances if any.
- xiv. The four boundaries of the applied area are fixed and the quarrying activity should be restricted within the area granted on lease.
- xv. The applicant firm should fence the lease granted area with barbed wire before the execution of lease deed as follows: -
  - The pillar post shall be firmly grounded with concrete foundation of height not less than 2mts with a distance between two pillars shall not be more than 3mts.



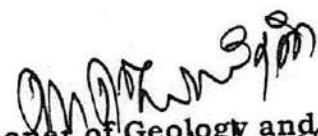
- 179
- The applicant firm shall incorporate the DGPS readings for the entire boundary pillars of the area and the same should be clearly shown in the mining plan.
  - A soft copy of the digitized map with DGPS readings should be submitted in the CD to the Deputy Director (G&M), Krishnagiri.
  - xvi. Barbed wire fencing or Compound wall should be erected all along the boundary of the lease granted area.
  - xvii. The applicant firm should use mild explosives during quarrying.
  - xviii. Child labour should not be engaged in the quarry works.
  - xix. The applicant firm should ensure that while starting the quarry work, all the quarry workers working under their control are registered in the Labour Welfare Board and also enrolled in the ongoing insurance scheme.
  - xx. The conditions mentioned in G.O. (Ms) No.79, Industries (MMC.1) Department, dated 06.04.2015 should be complied with.
  - xxi. The applicant firm should comply with the conditions stipulated in the Government of India, Ministry of Mines order No.11/02/2020, dated 14.01.2020 issued as per the orders of the Hon'ble Supreme Court of India dated 08.01.2020 that, "the mining leaseholders shall after ceasing mining operations, undertake re-grassing the mining area and any other area which may have been disturbed due to this mining activities and restore the land to a condition which is fit for growth of fodders, flora and fauna etc."
  - xxii. The applicant firm shall submit scheme of mining, mine closure plan and other statutory requirements within the time stipulated for submission of the above, as per rules.
  - xxiii. If any violation is found during quarrying operation, the penal provisions of the Tamil Nadu Minor Mineral Concession Rules, 1959 and other rules and act in force will attract.
  - xxiv. As per rule 12 (v) of the Mineral (other than Atomic and Hydro Carbons Energy Minerals) Concession Rules, 2016, the applicant

firm shall at his own expense, erect, maintain and keep in repair all boundary pillars.

xxv. Quarrying activity should be carried out from 07.00 AM to 05.00 PM only.

xxvi. A Green belt should be constructed to prevent sound and air pollution due to the proposed quarrying activity by planting at least 500 seedlings of Neem and Pungan all around the area.

Encl: Two copies of Approved Mining Plan

  
Commissioner of Geology and Mining  
19/4/2013

Copy Submitted to:

The Additional Chief Secretary  
to Government,  
Industries, Investment Promotion  
and Commerce Department,  
Secretariat, Chennai-600009.

Copy to:

1. The District Collector,  
Krishnagiri District.



# MINING PLAN FOR IRUDHUKOTTAI COLOUR GRANITE

(Under Rule 8-A of TNMMCR 1959 & Rule 12 of GCDR, 1999)

EXTENT : 1.09.0 HA  
S.F.NO : 1160/1 (PART)  
VILLAGE : IRUDHUKOTTAI  
TALUK : DENKANIKOTTAI  
DISTRICT : KRISHNAGIRI  
STATE : TAMIL NADU



## APPLICANT

**M/s. JAYRAN MINES,**  
D.NO. HIG-301,  
NEW TEMPLE LAND HUDCO,  
RAJAJI ROAD,  
HOSUR TALUK,  
KRISHNAGIRI DISTRICT - 635 109.

## Prepared by

**S. DHANASEKAR, M.Sc.(Geol), M.M.E.A.I.,**

**QUALIFIED PERSON,  
NO. 5/30-7 B, AVVAI NAGAR,  
PONKUMAR MINES ROAD,  
JAGIR AMMAPALAYAM,  
SALEM DISTRICT - 636 302.**

E-mail: [geodhana@yahoo.co.in](mailto:geodhana@yahoo.co.in)

CELL: 98946 28970 & 73733-74702.

← 0 2000



M/s. JAYRAN MINES,  
D.NO. HIG- 301,  
NEW TEMPLE LAND HUDCO,  
RAJAJI ROAD,  
HOSUR TALUK,  
KRISHNAGIRI DISTRICT – 635 109.



### CONSENT LETTER FROM APPLICANT

The Mining Plan in respect of Colour Granite Quarry over an Extent of 1.09.0Ha. of Government Poramboke Land in S.F.No.1160/1 (Part) in Irudhukottai Village, Denkanikottai Taluk, Krishnagiri District, Tamilnadu State has been prepared by Mr. S.Dhanasekar.M.Sc., Qualified Person.

I request the Director, Department of Geology and Mining, Chennai to make further correspondence regarding the modification/clarification in respect of the Mining Plan with the said qualified person at the following address.

S.Dhanasekar.M.Sc.,(Geol),M.M.E.A.I.,  
Qualified Person,  
No.5/30-7B, Avvai Nagar,  
Ponkumar Mines Road,  
Jagirammappalayam,  
Salem- 636 302.

I hereby undertake that all the modifications, if any 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.

For M/s. JAYRAN MINES,

*J. N. Natarajan*

Signature of the Applicant

*U- [Signature]*

Place: Krishnagiri  
Date:

*U- [Signature]*



The Mining Plan in respect of Colour Granite Quarry over an Extent of 1.09.0Ha. of Government Poramboke Land in S.F.No. 1160/1 (Part) in Irudhukottai Village, Denkanikottai Taluk, Krishnagiri District, Tamilnadu State has been prepared in full consultation with me by Mr.S.Dhanasekar.M.Sc., Qualified Person.

For M/s. JAYRAN MINES,

$\propto T$  - Newton's

Signature of the Applicant

V

~~10-20-21~~



S.Dhanasekar.M.Sc.,(Geol),M.M.E.A.I.,  
 Qualified Person,  
 No.5/30-7B, Avvai Nagar,  
 Ponkumar Mines Road,  
 Jagirammalayam,  
 Salem- 636 302.



### CERTIFICATE FROM THE QUALIFIED PERSON

This is to certify that the Provisions of Granite Conservation and Development Rules, 1999 and Tamil Nadu Minor Mineral Concession Rules, 1959 have been observed in the preparation of Mining Plan for Colour Granite Quarry over an Extent of 1.09.0Ha. of Government Poramboke Land in S.F.No.1160/1 (Part) in Irudhukottai Village, Denkanikottai Taluk, Krishnagiri District, Tamilnadu State. The Mining Plan has been prepared for M/s. Jayran Mines, D.NO.HIG- 301, New Temple Land Hudco, Rajaji Road, Hosur Taluk, Krishnagiri District – 635 109.

Whenever specific permissions/exemptions/ relaxations and approvals are required, the applicant will approach the concerned authorities of Department of Geology and Mining, Government of Tamilnadu, Guindy, Chennai- 600 032 for such permissions/ exemptions /relaxations and approvals.

It is also certified that information furnished in the above Mining Plan are true and correct to the best of my knowledge.

Certified

  
 Signature of Qualified Person.  
**S.DHANASEKAR, M.Sc.,(Geo)**  
 Qualified Person

Place: Salem.  
 Date:



S.Dhanasekar.M.Sc.,(Geol),M.M.E.A.I.,  
Qualified Person,  
No.5/30-7B, Avvai Nagar,  
Ponkumar Mines Road,  
Jagirammalayam,  
Salem- 636 302.



### CERTIFICATE FROM THE QUALIFIED PERSON

Certified that the Provisions of Mines Act, Rules and Regulations made there under have been observed in the preparation of Mining Plan for Colour Granite over an Extent of 1.09.0Ha. of Government Poramboke Land in S.F.No.1160/1 (Part) in Irudhukottai Village, Denkanikottai Taluk, Krishnagiri District, Tamilnadu. This Mining Plan has been prepared for M/s. Jayran Mines, D.NO.HIG- 301, New Temple Land Hudco, Rajaji Road, Hosur Taluk, Krishnagiri District – 635 109.

Wherever specific permissions/exemptions/ relaxations and approvals are required, the applicant will approach the concerned authorities of the Director General of Mines Safety (DGMS), No. 5, II<sup>nd</sup> Street, Block – AA, Anna Nagar, Chennai, Tamil Nadu for such permissions/ exemptions /relaxations and approvals.

It is also certified that information furnished in the mining plan are true and correct to the best of my knowledge.

Certified

Signature of Qualified Person.

**S.DHANASEKAR, M.Sc.,(Geo)**  
Qualified Person

Place: Salem.  
Date:





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## MINING PLAN FOR IRUDHUKOTTAI COLOUR GRANITE

(Under Rule 8-A of TNMMCR 1959 & Rule 12 of Granite Conservation and Development Rules, 1999)

### I. INTRODUCTION:

The present mining plan and Environmental Management Plan has been prepared to in favour of **M/s. JAYRAN MINES, D.NO.HIG- 301, NEW TEMPLE LAND HUDCO, RAJAJI ROAD, HOSUR TALUK, Krishnagiri District - 635 109** who has been granted to quarry **Colour Granite** over an Extent of **1.09.0 Ha** in S.F. No.1160/1(Part) in **Irudhukottai Village, Denkanikottai Taluk, Krishnagiri District** for a period of twenty years vide the precise area communication **Govt. letter No.898/MME.2/2021-1 dated 26.02.2021** With the following conditions

- 1) A Safety distance of 7.5 meters should be provided to the adjacent patta lands and should not cause any hindrance to them while quarrying and transportation.
- 2) A Safety distance of 10 meters should be provided to the Government Poramboke land in S.F.No.1160/1(P) on the north side of the lease area.
- 3) All conditions stipulated in the District Gazette Extra ordinary notification English No.20 and Tamil No.35 dated 09.10.2020 should be adhered by the Bidder.
- 4) Environmental clearance should be obtained from the State level Environmental Impact Assessment Authority before grant of quarry lease as per rule 42 of the Tamil Nadu Minor Mineral Concession rules, 1959.
- 5) The applicant firm should fence the lease granted area with barbed wire before the execution of lease deed as follows:-
  - The pillar post shall be firmly grounded with concrete foundation of height not less than 2 meters with a distance between two pillars shall not be more than 3 meters.
  - The applicant firm shall incorporate the DGPS readings for the entire boundary Pillars of the lease area and the same should be clearly shown in the mining plan.
  - A soft copy of the digitized map with DGPS readings should be submitted in the CD form of the Assistant Director (i/c), Krishnagiri.
- 6) The District Administration and Geology and Mining Department should ensure the conditions imposed in G.O.(Ms).No.79, Industries Department, dated 06.04.2015.
- 7) As per Rule 12(V) of Minerals (other than Atomic & Hydrocarbon Energy Minerals) Concession Rules, 2016, the applicant firm shall at their own expenses erect, maintain and keep in repair all the boundary pillars.



  
**S.DHANASEKAR, M.Sc., (Geo)**  
 Qualified Person



- 8) The applicant firm should use mild explosives during quarrying.
- 9) Child Labourers should not be engaged in quarry works.
- 10) If any violation is found during quarrying operation, the penal provisions of the Tamil Nadu Minor Mineral Concession Rules, 1959 and other rules and act in force will attract.
- 11) The applicant firm should ensure that while starting the quarry work, all the quarry workers working under his control are registered in the Labour Welfare Board and also enrolled in the ongoing insurance scheme.
- 12) The District Collector, Krishnagiri shall obtain a sworn-in-affidavit from the applicant firm containing the above conditions before execution of lease deed and also ensure that the instructions issued in Government Letter No.12789/MMB2/2002-7, Industries Department, Dated: 9.1.2003 are complied with.
- 13) The grant of quarry lease to the applicant firm in the applied area will be based on the Judgment of Hon'ble High Court of Madras in W.P.No.18317 of 2020 and W.M.P.No.16060/2020 and W.M.P.No.19999 of 2020.

The mining plan has been prepared incorporating the above conditions, complying the Rules and Regulations stipulated by the Government of Tamilnadu before and during the course of quarry operation.

The area applied for is a fresh lease over an extent of 1.09.0 Hectares Government Poramboke Land in S.F.No.1160/1 (Part) in Irudhukottai Village, Denkanikottai Taluk, Krishnagiri District, Tamil Nadu State. This mining plan is prepared as per the Rule 8-A of TNMMCR 1959 & Rule 12 of Granite Conservation and Development Rules, 1999.

The following Open cast method will be adopted to win the Colour granite dimensional stones occurring in this area.

The Top soil is removed by using excavator. The soil type of the area is gravelly in nature and it is having a thickness upto 1.0m and below which massive formation of Colour Granite may be encountered.

Usage of explosives is very minimal. Mild blasting with explosives in holes drilled by jack hammer of 32mm dia. will be adopted. No deep hole blasting is proposed.

Diamond wire saw cutting method: By this method the dimensional granite stones were splitted from the parent rock.

Using feather and wedges the defective portions are removed. Experienced Chisel men are used for dressing the blocks into required rectangular shaped dimensional stones without much wastage.

These rectangular dimensional granite stones are marketed to different needy customers by adopting strict quality control measures by experienced markers.



*Handwritten signature/initials*

**2.0 GENERAL****2.1 NAME OF THE APPLICANT WITH ADDRESS:**

Name : M/s. Jayran Mines  
 Address : D.NO. HIG- 301,  
 New Temple Land Hudco,  
 Rajaji Road,  
 Hosur Taluk,  
 Krishnagiri District.  
 District : Krishnagiri,  
 Pin code : 635 109  
 Mobile No: +91 94438 21375

**2.2 STATUS OF THE APPLICANT**

The applicant M/s. Jayran Mines is a Partnership firm.

**2.3 MINERAL WHICH THE APPLICANT INTENDS TO MINE**

The applicant intends to quarry Colour Granite Dimensional Stone.

**2.4 NAME AND ADDRESS OF THE QUALIFIED PERSON WHO PREPARED THE MINING PLAN**

Name : S.DHANASEKAR.M.Sc.,(Geol),M.M.E.A.I.,  
 QUALIFIED PERSON,  
 Address : 5/30-7B, Avvai Nagar,  
 Ponkumar Mines Road,  
 Jagir Ammapalayam,  
 Salem- 636 302.  
 Mobile No: +91 98946 28970  
 Mail:geodhana@yahoo.co.in

**2.5 NAME AND ADDRESS OF THE PROSPECTING AGENCY**

Long time back in the year 1992-93 the State Geology and Mining Dept., Govt. of Tamil Nadu, has also carried out the prospecting and exploration in these areas.

A detailed mapping of the commercial granite deposits of Tamilnadu has also been carried out by the Geological Survey of India. Apart from the survey conducted by the GSI, the Qualified Person along with his experienced team members made a detailed geological investigation of the area and demarcated the deposit clearly with a mine surveyor. The trend of the rock formation is N20°E - S20°W direction dipping towards South east. The massive deposit shows the mineable area of 7380m<sup>2</sup> after leaving the safety distance. The special team has estimated the inferred reserves of colour granite as 44280 cubic meters for a depth persistence of 20 meters with a recovery of 30%. Top soil is observed for a depth of 1.0m.

*(Signature)*



Address of the prospecting Agency:

- (i) STATE GEOLOGICAL DEPARTMENT  
O/O The Commissioner of Geology and Mining  
Thiru Ve Ka Industrial Estate,  
Guindy, Chennai - 32.
- ii) GEOLOGICAL SURVEY OF INDIA,  
Elliot Beach Road,  
Rajaji Bhavan,  
C.G.O Complex,  
Besant Nagar,  
Chennai - 600 090.



## 2.6 DETAILS OF THE AREA

- a. The area is marked by the Geological Survey of India, Topo Sheet No.57-H/15.
- b. The details of the land covered by the area is given below.

Table -1

| District & State        | Taluk         | Village      | S.F.No.       | Area in Hect. | Ownership occupancy       |
|-------------------------|---------------|--------------|---------------|---------------|---------------------------|
| Krishnagiri & Tamilnadu | Denkanikottai | Irudhukottai | 1160/1 (Part) | 1.09.0        | Government Poramboke land |
| Total Extent            |               |              |               | 1.09.0        |                           |

The area lies the North Latitude  $12^{\circ}25'38.1022''N$  to  $12^{\circ}25'43.1918''N$  and East Longitude of  $77^{\circ}50'27.3805''E$  to  $77^{\circ}50'22.8344''E$  on WGS datum-1984. (Plate No. II).

Satellite Map Showing on the Lease Applied Area Boundary Pillars GPS-Coordinates

## 2.7 WHETHER THE AREA RECORDED TO BE IN FOREST DEPARTMENT:

The area does not falls under forest land of any category. It is a Government Poramboke Land.

## 2.8 PERIOD FOR WHICH THE MINING AREA IS REQUIRED:

The quarry lease for **Colour Granite** is applied for a period of Twenty years.

## 2.9 INFRASTRUCTURE:

The quarry lease applied area is situated at a distance of about 1.5kms from Hanumanthapuram Village. Hanumanthapuram is at a distance of 25.0 kms from Rayakottai. Rayakottai is at a distance of 30.0Kms from Krishnagiri. Please refer Route Map - Plate No.IA.



TABLE - 2

| Particulars             | : | Location      | Distance from the investigated area |
|-------------------------|---|---------------|-------------------------------------|
| Nearest Post Office     | : | Denkanikottai | 10.0 kms -NW                        |
| Nearest Town            | : | Denkanikottai | 10.0 kms -NW                        |
| Nearest Police Station  | : | Denkanikottai | 10.0 kms -NW                        |
| Nearest Hospital        | : | Denkanikottai | 10.0 kms -NW                        |
| Nearest School          | : | Irudhukottai  | 3.5kms -W                           |
| Nearest D.S.P. Office   | : | Krishnagiri   | 56.0kms -NW                         |
| Nearest Railway Station | : | Rayakottai    | 28.0kms -NE                         |
| Nearest Seaport         | : | Chennai       | 280.0kms - NE                       |
| Nearest Airport         | : | Bangalore     | 85.0kms - N                         |

**WATER:**

Good drinking water is available from the nearby community wells and approved water vender situated in Irudhukottai Village also supplies drinking water. Besides, the ground water is potable without any adverse health effects.

**RIVERHEAD:**

There is no Rivers/Stream, Lakes, Reservoir or any water bodies within the 50m distance to the lease applied area.

**3.0 GEOLOGY AND RESERVES****3.1 PHYSIOGRAPHY**

The applied lease area is an Undulated rocky elevated terrain mostly covered up to 1m top soil followed by fresh Colour Granite deposits. Some detached weathering and fractured are observed along the strike which is the characteristic of granite deposits.

The average elevation of the study area is about 925m above M.S.L. The trend of the rock formation is N20°E - S20°W direction dipping towards South east.

There are few villages located within the 5 kms radius of quarry site and approximate distance with direction & population are given below.

| S.No | Name of the Village | Direction | Approximate Distance | Approximate population |
|------|---------------------|-----------|----------------------|------------------------|
| 1.   | Giryanapalli        | North     | 1.3kms               | 180                    |
| 2.   | Hanumanthapuram     | East      | 1.5kms               | 220                    |
| 3.   | Gullatty            | South     | 5.0kms               | 210                    |
| 4.   | Irudhukottai        | West      | 3.5kms               | 300                    |

Water table is found at a depth of 60m, in summer and at 52m in rainy season. The area receives rain fall of about 700 to 800 mm/per annum and the rainy period is mainly from Oct - Jan during North East monsoon. The summer is hot with maximum temperature up to 43°C.

20/10/2018



mainly from Oct – Jan during North East monsoon. The summer is hot with maximum temperature up to 43°C.

The top soil is to a thickness of about 1.0m. The area experiences moderate climate and there is scanty growth of vegetation in and around the quarry lease applied area.

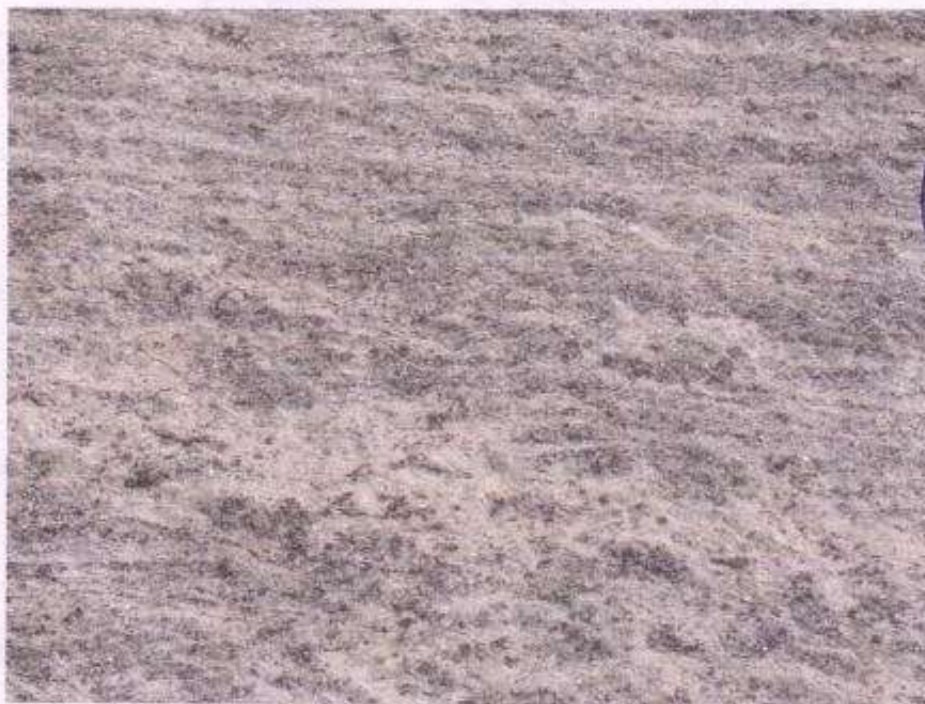
Topographical View of the Colour Granite Quarry Lease Applied Area



*Handwritten signature*



Photo View of the Colour Granite  
Megascopic Colour and Texture of Minerals



### 3.2 GEOLOGY

#### a. REGIONAL GEOLOGY:

Krishnagiri District is comprised of Archaean peninsular gneisses such as Charnockites, Hornblende gneisses, Biotite gneisses and migmatites, dolerites and are intruded by younger formations like pegmatite and quartz veins. The peninsular gneisses/migmatite consists of biotite mica, plagioclase and orthoclase feldspar and quartz and are found as heat rocks running to several kms from NNE-SSW as a massive rock formation.

The order of superposition of geological sequence are given as under,

#### ROCK TYPE:

|                              |                              |
|------------------------------|------------------------------|
| Top Soil gravelly earth      | - Recent Age                 |
| Pegmatite and Quartz veins   | - Archaean Age               |
| Dolerite Dyke                | - Archaean Age               |
| Migmatites (Paradiso& Multi) | - Archaean Age (Kolar Group) |
| Biotite Gneisses             | - Archaean Complex           |

The Regional rocks mostly composed of quartz, plagioclase feldspar, orthoclase feldspar and accessories like mica.

L U



## b. GEOLOGY OF THE LEASE APPLIED AREA:

## i) Mineralogy:

The Colour Granite deposits of this area are rich in orthoclase feldspar with excellent wave pattern. It is commercially called as **Paradiso**. It is mainly composed of mineral constituents such as biotite, Quartz, orthoclase feldspar and less plagioclase feldspar. It is a type of para gneiss with alternative bands of orthoclase and dark minerals. The biotite is fine grained and other minerals like alkaline and soda feldspars are medium grained. The flow structure, equigranular texture and presence of fresh orthoclase feldspars indicates that it is a type of Migmatite with purple colour feldspar. Presence of Xenoliths is common in this Colour Granite. Dimensional cutting and polishing of these type of hard and compact rocks exhibits an attractive alternative bands of light pink and dark minerals with excellent wave patterns.

It is a Colour granite covered partly by gravelly soil. The rock is hard, compact and sheet in nature so as to cut required sizes of blocks. The mineral constituents of the rock mass shall be about Orthoclase feldspar 45%, Quartz roughly 20%, Plagioclase feldspar 15%, mica 15% and others 5%.

## ii) Geological setting and structure:

The order of geological sequence are,

| <b>Description</b>                     | <b>Geological Age</b> |
|----------------------------------------|-----------------------|
| Top Soil- (Intermittent)               | - Recent              |
| Migmatite (Paradiso) with wave Pattern | - Archaean            |
| Biotite Gneisses (Peninsular Gneisses) | - Archaean            |

The Top soil cover is found all around the exposures of outcrops of Colour Granite. The trend of the rock formation is N20°E - S20°W direction dipping towards South east. The regional trend is shown in the geological plan. The Colour Granite that occur in this area is massive with less boulders of fractures. It is suitable for commercial exploitation of gang saw size rough blocks.

## c. QUALITY OF THE DEPOSIT:

The granite gneiss is inequigranular, medium to coarse grained having wavy pattern. Because of having flow texture with feldspar, quartz and other mafic minerals, the gneissic rock is suitable for ornamental purposes after cutting and polishing.

The physical attitude of the Colour Granite deposits of this area are given below.

|                  |                 |
|------------------|-----------------|
| Area in Ha       | - 1.09.0 Ha     |
| Strike Direction | - N20°E - S20°W |
| Dip direction    | - SE            |



### 3.3 DETAILS OF EXPLORATION

#### 3.3.1 ALREADY CARRIED OUT

As far as Colour Granite deposits are concerned, the only practical method is the systematic geological mapping, delineation of commercial Colour Granite bodies within the field and careful evaluation of body luster, physical properties, commercial aspects etc.

Explorations were conducted by the Central and State Governments.

1. In the year 1966 the Government of India conducted exploration study of the availability of Granite blocks in this area through Geological Survey of India.
2. Between the year 1992 to 1993 the State government represented by the Department of Geology and Mining conducted the exploration study for granite in this area.

Based on the valuable geological information available by the exploration conducted by the Central and the State Government, the geological reserves are estimated. Considering the waste expected, mineable reserves are arrived.

#### 3.3.2 PROPOSED STUDY TO BE CARRIED OUT:

The petrogenetic Character of the Colour granite stone may be beyond 21.0m depth but the economically viable depth persistence of the Colour Granite Stone has been taken to calculate all the categories of proved, probable and possible reserves as 21.0m only (1.0m Topsoil + 20.0m Colour Granite). The recovery of saleable Colour Granite stones (Gang saw size) has been taken as 30%.

The proposed depth of the quarry for the **first 5 years** is given upto **6.0m** below ground level. The quarrying activities during the first 5 years with deep cut as envisaged in the mining plan may render additional data as may be required for future planning.

#### 3.4 METHOD OF ESTIMATION OF RESERVES

The geological plan has been prepared in 1:1000 scale (Plate No. IV). With Three sections have been drawn, one section (X-Y) as lengthwise and another two sections are (A-B) & (C-D) drawn as widthwise. These Sections are suitably chosen to cover maximum area.

The proved depth persistence of 21.0m (1.0m topsoil + 20.0m Colour Granite) has been worked out for each cross sectional area. The cross sectional area multiplied by its length of influence on the longer axis gives the volume. The total of the Insitu reserves available within the individual cross sectional area gives the Geological Resources of the quarry lease applied area.



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The quantity of saleable granite stones and quantity of granite waste generation are computed by applying recovery factor of about 30% from the total geological resources. The salable Colour Granite stone are in terms of cubic meters (Volume) only. This differs from the other Major minerals which are quantified in Tonnage. In Granite the geological resources, mineable reserves and quantum of waste generated etc, are given only in terms of cubic meters. (Volume).

The details of estimation of Geological Resources and Mineable Reserves with reference to the Geological Plan & Cross section and Conceptual Plan & Section as shown in (Plate no.IV and VIII) have been furnished in Table - 4 & Table - 5 respectively.



T. J. K.



## 3.5.0 GEOLOGICAL RESOURCES:

Table -4

| GRANITE GEOLOGICAL RESERVES |       |       |       |       |                          |                                      |                                     |                                     |                            |                               |
|-----------------------------|-------|-------|-------|-------|--------------------------|--------------------------------------|-------------------------------------|-------------------------------------|----------------------------|-------------------------------|
| Section                     | Bench | L (m) | W (m) | D (m) | Volume In m <sup>3</sup> | Total Reserves ROM in m <sup>3</sup> | Color Granite 30% in m <sup>3</sup> | Granite Waste 70% in m <sup>3</sup> | Top Soil in m <sup>3</sup> | Total Waste in m <sup>3</sup> |
| XY-AB                       | I     | 76    | 91    | 1     | 6916                     |                                      |                                     |                                     | 6916                       | 6916                          |
|                             | II    | 52    | 76    | 5     | 19760                    | 19760                                | 5928                                | 13832                               |                            | 13832                         |
|                             | III   | 76    | 91    | 5     | 34580                    | 34580                                | 10374                               | 24206                               |                            | 24206                         |
|                             | IV    | 76    | 91    | 5     | 34580                    | 34580                                | 10374                               | 24206                               |                            | 24206                         |
|                             | V     | 76    | 91    | 5     | 34580                    | 34580                                | 10374                               | 24206                               |                            | 24206                         |
| TOTAL                       |       |       |       |       |                          | 123500                               | 37050                               | 86450                               | 6916                       | 93366                         |
| XY-CD                       | I     | 68    | 59    | 1     | 4012                     |                                      |                                     |                                     | 4012                       | 4012                          |
|                             | II    | 68    | 59    | 5     | 20060                    | 20060                                | 6018                                | 14042                               |                            | 14042                         |
|                             | III   | 68    | 59    | 5     | 20060                    | 20060                                | 6018                                | 14042                               |                            | 14042                         |
|                             | IV    | 68    | 59    | 5     | 20060                    | 20060                                | 6018                                | 14042                               |                            | 14042                         |
|                             | V     | 68    | 59    | 5     | 20060                    | 20060                                | 6018                                | 14042                               |                            | 14042                         |
| TOTAL                       |       |       |       |       |                          | 80240                                | 24072                               | 56168                               | 4012                       | 60180                         |
| GRAND TOTAL                 |       |       |       |       |                          | 203740                               | 61122                               | 142618                              | 10928                      | 153546                        |

Topsoil = 10928 m<sup>3</sup>  
 Total Reserves ROM = 203740 m<sup>3</sup>  
 Colour Granite Recovery @ 30% = 61122 m<sup>3</sup>  
 Granite Waste @ 70% = 142618 m<sup>3</sup>  
 Total Waste = 153546 m<sup>3</sup>  
 Granite Waste ratio = 1:2.51



**MINEABLE RESERVES:**

Table -5

| MINEABLE RESERVES |       |       |       |       |                          |                                      |                                     |                                     |                            |                               |
|-------------------|-------|-------|-------|-------|--------------------------|--------------------------------------|-------------------------------------|-------------------------------------|----------------------------|-------------------------------|
| Section           | Bench | L (m) | W (m) | D (m) | Volume In m <sup>3</sup> | Total Reserves ROM in m <sup>3</sup> | Color Granite 30% in m <sup>3</sup> | Granite Waste 70% in m <sup>3</sup> | Top Soil in m <sup>3</sup> | Total Waste in m <sup>3</sup> |
| XY-AB             | I     | 78    | 77    | 1     | 6006                     |                                      |                                     |                                     | 6006                       | 6006                          |
|                   | II    | 64    | 67    | 5     | 21440                    | 21440                                | 6432                                | 15008                               |                            | 15008                         |
|                   | III   | 72    | 64    | 5     | 23040                    | 23040                                | 6912                                | 16128                               |                            | 16128                         |
|                   | IV    | 67    | 54    | 5     | 18090                    | 18090                                | 5427                                | 12663                               |                            | 12663                         |
|                   | V     | 62    | 44    | 5     | 13640                    | 13640                                | 4092                                | 9548                                |                            | 9548                          |
| TOTAL             |       |       |       |       |                          | 76210                                | 22863                               | 53347                               | 6006                       | 59353                         |
| XY-CD             | I     | 49    | 44    | 1     | 2156                     |                                      |                                     |                                     | 2156                       | 2156                          |
|                   | II    | 48    | 42    | 5     | 10080                    | 10080                                | 3024                                | 7056                                |                            | 7056                          |
|                   | III   | 43    | 32    | 5     | 6880                     | 6880                                 | 2064                                | 4816                                |                            | 4816                          |
|                   | IV    | 38    | 22    | 5     | 4180                     | 4180                                 | 1254                                | 2926                                |                            | 2926                          |
|                   | V     | 33    | 12    | 5     | 1980                     | 1980                                 | 594                                 | 1386                                |                            | 1386                          |
| TOTAL             |       |       |       |       |                          | 23120                                | 6936                                | 16184                               | 2156                       | 18340                         |
| GRAND TOTAL       |       |       |       |       |                          | 99330                                | 29799                               | 69531                               | 8162                       | 77693                         |





|                               |   |                      |
|-------------------------------|---|----------------------|
| Topsoil                       | = | 8162 m <sup>3</sup>  |
| Total Reserves ROM            | = | 99330 m <sup>3</sup> |
| Colour Granite Recovery @ 30% | = | 29799 m <sup>3</sup> |
| Granite Waste @ 70%           | = | 69531 m <sup>3</sup> |
| Total Waste                   | = | 77693 m <sup>3</sup> |
| Granite Waste ratio:          | = | 1:2.60               |



The geological resources computed based on the geological cross sections up to the economically workable depth of 21.0m from the top surface of the area wise (1.0m topsoil + 20.0m Colour Granite) works out to 61122m<sup>3</sup> (30% recovery) cubic meters (Table-4) and mineable reserves have been computed as 29799 m<sup>3</sup> (Table-5) at the rate of 30% recovery upto a depth of 21.0m(1.0m topsoil + 20.0m Colour Granite).

The mineable reserve is found out by deducting the locked up area in safety distance all along the perimeter of the lease boundaries. Proved & possible reserves are categorized up to 21.0m depth (1.0m topsoil + 20.0m Colour Granite).

The Colour Granite body occurring in this area exhibits more or less uniform color and texture and sold in par with commercial granite deposit. If any variations occur locally during mining such as cracks flaws and patches, the defective area is removed during dressing & marketed. The deposit is uniform and no gradational change is noticed except some shear, cracks, xenoliths and slender pegmatite veins.

#### 4.0 MINING

Under the regulation 106 (2) (b) of the Metallurgical Mines Regulation 1961, in all open cast mining, the bench height should not exceed 5.0m and bench width should not be less than bench height. The slope of the bench should not exceed 60° from horizontal.

Due to the prevailing difficulties in mining granite dimensional stone, it is proposed to obtain relaxation to the provisions of the above regulation from the Director of Mines Safety Chennai for which necessary provision is available with the Regulation 106 (2) (b) of the Metallurgical Mines Regulation 1961.

The production of Colour Granite dimensional stone is contrary to the method of mining of other major minerals.

The following methods are familiar with the production of Colour Granite dimensional stone:

**PRIMARY CUTTING:** By adopting the method of Diamond wire cutting considerable volume of the Colour granite dimensional stone is carefully removed by splitting from the parent rock. Special care is being taken to avoid any visibly seen defects such as cracks.

This liberation of huge volume of granite body from the parent rock is called "primary cutting". This huge portion is further split into several blocks of desirable dimension.

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Hydraulic cranes are used to lift the blocks splitted and shifted to the dressing yard for further processing.

Skilled laborers will be engaged for removing the defective portions and dressing them in to dimensional blocks by manual methods using feather and wedges and chiseling respectively.

Under the continuous supervision of experienced personals the defects free dimensional stone of different sizes are thus produced by the method as described above. The marketable grade of Colour granite dimensional stone is segregated depending upon the need of customers.

The granite waste materials generated during quarrying activity will be taken in tippers and proposed to dump in the Southern side of the lease applied area with dimension of L45.0m X W25.0mX H15.55m. (Plate No. V and VI) for the first 5 years.

The excavated top soil will be utilized for afforestation and construction of bunds and haul roads.



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## 4.1 YEAR WISE DEVELOPMENT AND PRODUCTION FOR THE FIRST FIVE YEARS

Table -6

| YEARWISE DEVELOPMENT & PRODUCTION |       |          |          |          |                             |                                               |                                              |                                              |                                  |                                     |
|-----------------------------------|-------|----------|----------|----------|-----------------------------|-----------------------------------------------|----------------------------------------------|----------------------------------------------|----------------------------------|-------------------------------------|
| Year                              | Bench | L<br>(m) | W<br>(m) | D<br>(m) | Volume<br>In m <sup>3</sup> | Total<br>Reserves<br>ROM in<br>m <sup>3</sup> | Color<br>Granite<br>30%<br>in m <sup>3</sup> | Granite<br>Waste<br>70% in<br>m <sup>3</sup> | Top<br>Soil in<br>m <sup>3</sup> | Total<br>Waste<br>in m <sup>3</sup> |
| I<br>YEAR                         | I     | 24       | 54       | 1        | 1296                        |                                               |                                              |                                              | 1296                             | 1296                                |
|                                   | II    | 20       | 50       | 5        | 5000                        | 5000                                          | 1500                                         | 3500                                         |                                  | 3500                                |
| TOTAL                             |       |          |          |          |                             |                                               |                                              |                                              |                                  |                                     |
| II<br>YEAR                        | I     | 20       | 54       | 1        | 1080                        |                                               |                                              |                                              | 1080                             | 1080                                |
|                                   | II    | 20       | 50       | 5        | 5000                        | 5000                                          | 1500                                         | 3500                                         |                                  | 3500                                |
| TOTAL                             |       |          |          |          |                             |                                               |                                              |                                              |                                  |                                     |
| III<br>YEAR                       | I     | 20       | 54       | 1        | 1080                        |                                               |                                              |                                              | 1080                             | 1080                                |
|                                   | II    | 20       | 50       | 5        | 5000                        | 5000                                          | 1500                                         | 3500                                         |                                  | 3500                                |
| TOTAL                             |       |          |          |          |                             |                                               |                                              |                                              |                                  |                                     |
| IV<br>YEAR                        | I     | 20       | 54       | 1        | 1080                        |                                               |                                              |                                              | 1080                             | 1080                                |
|                                   | II    | 20       | 50       | 5        | 5000                        | 5000                                          | 1500                                         | 3500                                         |                                  | 3500                                |
| TOTAL                             |       |          |          |          |                             |                                               |                                              |                                              |                                  |                                     |
| V<br>YEAR                         | I     | 20       | 54       | 1        | 1080                        |                                               |                                              |                                              | 1080                             | 1080                                |
|                                   | II    | 20       | 50       | 5        | 5000                        | 5000                                          | 1500                                         | 3500                                         |                                  | 3500                                |
| TOTAL                             |       |          |          |          |                             |                                               |                                              |                                              |                                  |                                     |
| GRAND TOTAL                       |       |          |          |          |                             |                                               |                                              |                                              |                                  |                                     |
|                                   |       |          |          |          |                             | 25000                                         | 7500                                         | 17500                                        | 5616                             | 23116                               |



|                                             |                        |
|---------------------------------------------|------------------------|
| Topsoil                                     | = 5616 m <sup>3</sup>  |
| Total Reserves ROM first five years         | = 25000 m <sup>3</sup> |
| Colour Granite 5% Recovery first five years | = 7500 m <sup>3</sup>  |
| Granite waste @ 70%                         | = 17500 m <sup>3</sup> |
| Total Waste                                 | = 23116 m <sup>3</sup> |
| Granite Waste ratio                         | = 1:3.08               |

#### Estimated Life of the quarry

|                                   |                             |
|-----------------------------------|-----------------------------|
| Mineable ROM                      | = 99330 m <sup>3</sup>      |
| Mineable Recoverable Reserve(30%) | = 29799 m <sup>3</sup>      |
| Average production per year       | = 1500 m <sup>3</sup>       |
| Estimated Life of the Quarry      | = 29799 / 1500 = 19.8 years |

**Life = 20 years**

The year wise quantum of work proposed and the details of estimation of production quantity and generation of waste are furnished in Table-6 with reference to Year wise Development and Production plan (Plate No.V).

The quarrying block is shown in such a way to meet the average annual production. The average annual production for the first five years is 1500m<sup>3</sup> at the rate of 30% recovery. (Refer Table No.6).

For achieving this rate of production a total quarrying block with dimension of 100m(L) x 50m(W) x 6m(D) of 1<sup>st</sup> to 5<sup>th</sup> year is selected from the North side towards southern side of the lease applied area. More details of the five year wise production parameter are explained with bench length, width and height in Plate No.V & Table No.6.

#### 4.2 PROPOSED RATE OF PRODUCTION WHEN THE QUARRY IS FULLY DEVELOPED

The proposed rate of production when the quarry is fully developed is 1500m<sup>3</sup> per annum and 7500m<sup>3</sup> for the first five years @ 30% recovery. (Table-6).

#### 4.3 MINEABLE RESERVES AND ANTICIPATED LIFE OF MINE

The Colour Granite is deep seated in nature. The depth persistence of the Colour Granite will be beyond the economically workable depth. The method of extraction of rock mass from Colour Granite rock is highly expensive affair at greater depths.

An optimum depth of 21.0m (1.0m topsoil + 20.0m Colour Granite) for entire lease period has been established as economically viable depth. Eventually this depth is the optimum depth for safe and scientific quarrying.

The mineable reserves are calculated by excluding the mining loss due to formation of benches, ultimate depth of mine, the mineral reserve held up within the safety distances all along the boundary of quarry lease applied area.



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The mineable reserves for this Colour Granite quarry is thus arrived as **29799m<sup>3</sup>** (Table-5) and **ROM 99330m<sup>3</sup>** (Table-5) for an assumed depth of 21.0m from top surface (1.0m topsoil + 20.0m Colour Granite). The details of estimation of five years development plan (plate no.V) is furnished in Table-6.

The average rate of production of Colour Granite from this quarry is 1500m<sup>3</sup> per year and mineable reserves 99330m<sup>3</sup>.

Based on the above, and taking into consideration of the available Mineable Reserves, **the life of mine will be about 20 years**, if the quarry is being worked continuously with prevailing market conditions and according to this mining plan.

#### 4.3.1 CONCEPTUAL MINING PLAN

Conceptual mining plan is prepared with an object of long term systematic development of benches; lay outs, selection of permanent ultimate pit limit, depth of mining and ultimate pit, selection of sites for construction of infrastructure etc.

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 dimensions of the quarry are given below. (Please refer Plate No.VIII).

| ULTIMATE PIT DIMENSION |          |       |
|------------------------|----------|-------|
| Length                 | Width    | Depth |
| 126m                   | 60m(avg) | 21.0m |

However, during extraction of blocks each bench will be of 5 mts height with vertical slope for proper dimensional cutting. The quantum of excavation is estimated to be 99330 m<sup>3</sup> for depth of 21.0m (1.0m topsoil + 20.0m Colour Granite)(refer Table-5).

The waste is estimated as 69531m<sup>3</sup>, (Table-5) and marketable granite blocks as 29799m<sup>3</sup>. (Plate No-VIII). An earth bund of 1m height will be formed around the quarry lease boundary over the topsoil.

#### 4.4.0 METHOD OF MINING

##### 4.4.1 OPEN CAST WORKING

In accordance with the Regulation 106 (2) (b) of the Metalliferous Mines Regulations 1961, in all open cast working where the ore body forms hard rock, the working faces and sides should be adequately benched and sloped; a bench height not exceeding 5m and a bench width not less than the bench height has to be maintained. The slope angle of such benches and sides should not exceed 60° from horizontal.



However, observance of these statutory provisions in granite dimensional stone mining is seldom possible due to the field difficulties and technical reasons as below:

1. Complying the statutory parameters, series blasting may not be possible due to formation of benches and sides. Special care to be taken for the production of undamaged rectangular dimensional blocks. Due to the generation of blasting cracks the marketable granite stone may get spoiled.
2. The 60° slope formation poses practical difficulty in forming benches within the granite deposit. The granite portion confined within the 60° while extracted as blocks will generate mineral waste while shaping into rectangular blocks.
3. The size of the granite blocks extracted plays a major role in the industry. Huge blocks with measurements up to 3 m x 2 m x 2 m. is not at all possible with a moving bench of 5m height. Production of such huge blocks in turn increases the recovery and reduces the mineral waste during dressing. Smaller size of blocks of certain varieties of granite are not marketable now-a-days (or) has a less commercial value.
4. The problem of mineral locked up prevails during the formation of too many benches with more height and the width equal to the height.

To facilitate economical mining operations, it is proposed to obtain relaxation to the provisions of Regulation 106 (2) (b) Metalliferous Mines Regulations 1961 up to a bench parameter of 5.0m height & 5.0m width with vertical faces.

Since the entire terrain is made up of hard rock, compact sheet and possess high stability on slope even at higher vertical angles the proposed bench parameters may not be detrimental to the DGMS.

#### 4.4.2 EXTENT OF MECHANIZATION / COST OF MACHINERY:

The following machineries are utilized on rental basis for the development and production work at this mine.

##### I. DRILLING MACHINE

| S.No | Type                      | Nos | Dia Hole mm | Size Capacity         | Make        | Motive power     |
|------|---------------------------|-----|-------------|-----------------------|-------------|------------------|
| 1    | Jack hammer & Accessories | 3   | 32          | 1.2m to 6m            | Atlas Copco | Compressed air   |
| 2    | Compressor                | 2   |             | 400 psi               | Atlas Copco | Diesel Drive     |
| 3    | Diamond wire saw          | 1   | -           | 30m <sup>3</sup> /Day | Optima      | Diesel Generator |
| 4    | Gen set                   | 1   | -           | Powerica              | -           | CP 125 D5P (H.P) |



## II. LOADING EQUIPMENT

| S.No. | Type      | Nos | Capacity | Make    | Motive Power |
|-------|-----------|-----|----------|---------|--------------|
| 1     | Excavator | 1   | 350      | Kobelco | Diesel Drive |

## III. HAULAGE WITHIN THE MINE &amp; TRANSPORT EQUIPMENT

| S.No. | Type    | Nos | Capacity  | Make | Motive Power |
|-------|---------|-----|-----------|------|--------------|
| 1     | Tippers | 1   | 10 tonnes | Tata | Diesel Drive |

## IV. TRANSPORT FROM THE QUARRY HEAD TO DESTINATION

The Raw blocks from Quarry head is transported to the Dressing Site, then to desired destination by trucks or by trailers.

## V. MISCELLANEOUS:

Apart from the above the following tools and tackles are required for quarry operation.

## A. For operation

The operation of granite quarry requires the following loose tools material and have to be kept sufficiently in stock for non - interruption of the quarry work.

1. Drill roads - 0.3m ,0.4m , 0.5 m ,0.6m , 0.75m ,1.65m, 2.25m, 3m, 3.6m, 3.6m, 4.6m, 5.6m & 6.6m.
2. Steel Alloy chains of sufficient length of 12mm, 16mm and 18mm, sizes.
3. 'D' shackles to link the chain lengths.
4. Rubber hose of required length.
5. Hose clamps to link the compressor delivery hoses.
6. Feather and wedges of 6" and 12" dia sizes utilize for splitting the block from the parent rock. This is an important tool in the operation of a quarry.
7. Crow bars.
8. Spades.
9. Sludge Hammer
10. Iron Pans
11. Pitcher Hammer
12. Chisels.
13. Consumables, such as diesel, Hydraulic oil, grease, abrasive wheels, welding Machines etc.
14. Stock of essential spare parts of machinery.





In addition to the above diamond wire saw equipment with accessories are required to remove rock from parent body rapidly with minimum damage.

The above machineries are adequate to meet out the simultaneous development and production schedule drawn out in this mining plan.

## 5. BLASTING

During future development of quarrying, removal of Top soil will be done by excavator and mild blasting with explosives in holes drilled by jack hammer of 32mm dia especially. No deep hole blasting is proposed. Portable magazine has been proposed to install in the ear marked places. Authorized explosive dealers supply the explosive at site as per the requirement.

## 6.0 MINE DRAINAGE

Quarry operation is confined to 21m which is well above the water table which is 60m in summer and 52m during rainy season. This water table is observed in nearby wells. Even during rainy season if there is any water seepage the same may be drained out using diesel pumps and will be utilized for afforestation area.

## 7.0 STACKING OF MINERAL WASTE AND DISPOSAL OF WASTE

### a) Topsoil:

The thickness of 1m topsoil will measure about 5616m<sup>3</sup> of the quarry which will be utilized for construction of bunds, road and afforestation purpose.

### b) Granite waste:

First five years Colour Granite waste forms nearly 70% of ROM and the quantity of waste in the five years will be around 23116m<sup>3</sup>. The Granite waste material will be proposed to dump in the Southern side of the lease area.

### c) Land chosen for disposal of waste:

The Proposed granite waste (70%) will be dumped in the Southern side of the lease applied area with dimensions 45.0m (L) X 25.0 (W) X 15.55m (H).avg which will also accommodate the waste generated during the first five years. (Plate No. V and VIII).

### d) Manner of disposal of waste:

As and when there is accumulation of waste, the same will be loaded into the tipper by loading machines and dumped in the respective places.

The waste management plan with reference to the quantum of waste generated (Table No-6) is shown in Mine layout and Afforestation plan (Plate No.VI).



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**8.0 USE OF THE GRANITE STONE**

The quarried Colour Granite blocks are either exported as raw blocks or processed as value added products such as slabs, tiles, fancy items, Monuments, precision surface plates for engineering application.

The export market for granite is china, European Country, North America, Middle East, Far East, Japan, Taiwan & Canada besides catering local markets.

**9.0 QUALITY CONTROL**

The Colour Granite deposit occurring in this quarry shows uniform quality throughout and hence will be quarried and marketed as a single variety.

The excavated blocks will be carefully inspected for any natural defects such as joints, cracks, xenoliths growth etc and such defects will be removed manually using feather and wedges and the blocks are then shaped into perfect rectangular dimensional stone blocks by chiseling. Different price for each quality material have been fixed and the entire production quantity is marketed accordingly.

**10. SURFACE TRANSPORT**

The mode of transport of the granite blocks produced and marketed is by road to various customer destinations and granite processing units located at different parts of the country. The Colour Granite blocks approved for export market are shipped from Tuticorin Harbour to various countries and if required the blocks may be shifted to Chennai Harbour which depend upon the exporters' destination.

**11. SITE SERVICES**

The simple methods adopted and the limited scale of activities involved in granite dimensional stone quarrying does not require high tension electric power supply or huge workshop facilities. The quarry operation is restricted to one general shift during day time only. Machinery repair works are attended at Denkanikottai (10.0kms) town. Minor repairs carried out by applicant staff at the quarry site itself.

Potable drinking water will be supplied from the nearby community wells and approved water vender can be transported to the work site through tanker placed on tippers. Quarry office, first-aid room, store room, rest shed, toilet etc, will be provided on semi - permanent structures within the quarry lease applied area (Plate No - V - IX).



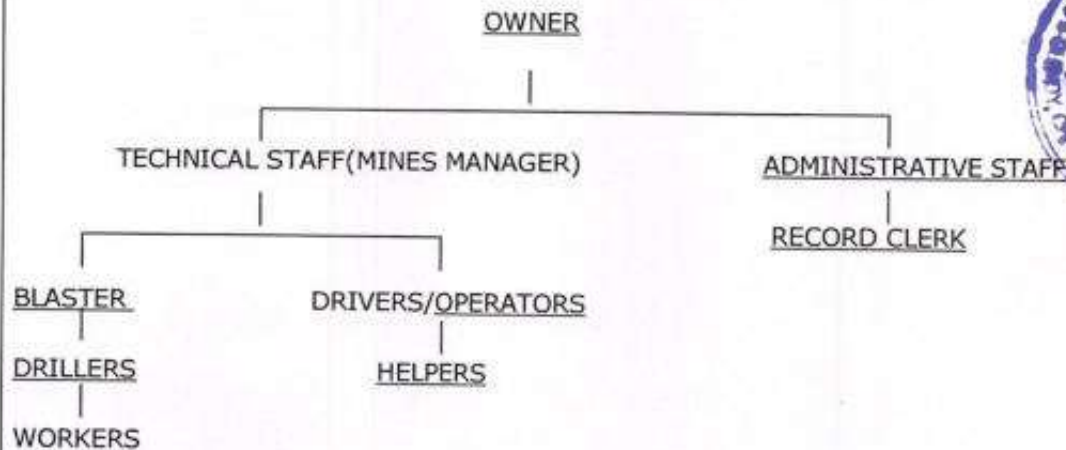
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## 12. EMPLOYMENT POTENTIAL

The man power is proposed for the Colour Granite Quarry to look after and carryout the day-to-day quarrying activities, and achieves targeted production duly comply with the statutory provisions of the Quarry is as summarized below:

### ORGANISATION CHART



The strength of man power requirement is proportionate to the proposed production for the Colour Granite Quarry in the referred area as detailed below:

|    |               |   |               |
|----|---------------|---|---------------|
| 1. | Mines Manager | : | 1             |
| 2. | Record Clerk  | : | 1             |
|    | Total         | : | <b>2 Nos.</b> |

#### Highly skilled, Skilled, Semi-skilled and Unskilled:

|                                      |   |               |
|--------------------------------------|---|---------------|
| Supervisor Cum Blaster               | : | 1             |
| <b>Skilled:</b>                      |   |               |
| Compressor and Wagon Drill operators | : | 2             |
| Drillers / Workers                   | : | 4             |
| Excavator / Rock Breaker Operators   | : | 2             |
| Vehicle Driver                       | : | 1             |
| Total                                | : | <b>11 Nos</b> |
| <b>Semi-skilled:</b>                 |   |               |
| Watchman                             | : | 1             |
| Total                                | : | <b>1 Nos</b>  |
| <b>Unskilled - Cleaner</b>           | : | 3             |
| Total                                | : | <b>3 Nos</b>  |
| <b>Grand Total</b>                   | : | <b>17 Nos</b> |

The man power strength is subject to the extent of mechanizations. The above mentioned technical staff and administrative staff are to be considered to meet out the production schedule and to comply with the statutory provisions of the Mines Safety Regulations.

**13.0 ENVIRONMENTAL MANAGEMENT PLAN****13.1 BASELINE INFORMATION**

The following observations are made for environmental management plan.

**I. EXISTING LAND USE PATTERNS:**

The quarry lease applied area Undulated rocky elevated terrain at an average height of 3 meters above the ground level. The area receives 700 - 800mm rainfall/annum and the ground water occurs at a depth of 60m in summer and 52m during rainy season. Villagers use water for drinking and other domestic purposes without any adverse health effect. Agricultural activities are carried out by utilizing well water (lift irrigation). The area experiences moderate climate and there is scanty growth of vegetation in and around the quarry lease applied area.

**II. WATER REGIME:**

Quarry operation is confined to 21m which is well above the water table which is 60m in summer and 52m during rainy season. This water table is observed in nearby wells. The water level would not be affected by the quarry operation. There is no lake, river or reservoir within 50m radius of the quarry lease applied area.

**III. FLORA AND FAUNA:**

The main crops are Neem, Mango, Plam, Julia flora, aspera.,etc. In some places lift irrigation is carried out. There is no wild life, bird sanctuary, reserve or social forest within 500m radius of the quarry lease applied area.

**IV. CLIMATIC CONDITIONS:**

The prevailing climatic condition experienced in the quarry lease applied area is semi-arid with maximum temperature up to 43°C in summer is very dry and falls down to 22° C during winter seasons. The area receives 700 - 800mm rainfall per annum during both south west and north east monsoons.

**V. HUMAN SETTLEMENT:**

There are few villages located within the radius of 5km from the quarry lease applied area. It is rural area with small hamlets scattered all around the area. The approximate distance and population are given below.

| S.No | Name of the Village | Direction | Approximate Distance | Approximate population |
|------|---------------------|-----------|----------------------|------------------------|
| 1.   | Giryanapalli        | North     | 1.3kms               | 180                    |
| 2.   | Hanumanthapuram     | East      | 1.5kms               | 220                    |
| 3.   | Gullatty            | South     | 5.0kms               | 210                    |
| 4.   | Irudhukottai        | West      | 3.5kms               | 300                    |



Basic human welfare amenities such as health center, schools, communication facilities, commercial centers etc are available in Denkanikottai town which is at a distance of about 10.0kms towards North western side of the lease applied area.

#### VI. PUBLIC BUILDINGS, MONUMENTS AND PLACES OF WORSHIPS:

There are no permanent structures like National Monuments, Places of Worship, Residential Areas and Places of Archaeological Interest within 300m radius from the area applied for quarrying lease.



#### 13.2 ENVIRONMENT IMPACT ASSESSMENT STATEMENT

The mining plan is proposed for production of Colour Granite dimensional stone without involving deep hole drilling. Mild blasting is done to minimize the shattering effect. Such limited mining activity will not cause any impact adversely on environment as far as pollution of air, water and noise is concerned.

##### (a) Four Boundaries of the Lease applied area:

| Applied Area S.F.No. | Direction | S.F.No       | Classification  |
|----------------------|-----------|--------------|-----------------|
| 1160/1(Part)         | North     | 1160/1(Part) | Government land |
|                      | East      | 1160/5       | Patta land      |
|                      | South     | 890          | Patta land      |
|                      | West      | 1159         | Patta land      |

##### (b) Approach road facility:

Approach road facility is available.

##### (c) Environmental Aspects:

The area applied for quarry lease is situated in an Undulated rocky terrain with gentle slope towards Northwest. The soil type of the area is gravelly soil in nature and is having an average thickness of about 1.0m. Hence, there is no chance for slope destabilization of the area. There is no fauna and flora of botanical importance. Hence it is noticed that there will be no chance for the degradation of environment and geology of the area due to the proposed quarrying activity.

##### (d) Whether HACA Clearance has been obtained:

The lease applied area Irudhukottai village of Denkanikottai Taluk is not classified under hill area as per G.O.M.S.No.49 Housing & Urban Development (UD 22) Department dated 24.03.2003 and hence obtaining clearance from Hill area conservation authority does not arise.



**e) PROPOSED ENVIRONMENT MANAGEMENT(EMP) FOR FIXED ASSET COST AND OPERATIONAL COST:**

**A.FIXED ASSET COST:**

| SL.No        | Description                                            | Amount (Rs)        |
|--------------|--------------------------------------------------------|--------------------|
| 1            | Land cost(Tender Amount For Government Poramboke Land) | 1,37,00,000        |
| 2            | Labour shed                                            | 1,60,000           |
| 3            | Sanitary facility                                      | 70,000             |
| 4            | Fencing cost                                           | 90,000             |
| <b>Total</b> |                                                        | <b>1,40,20,000</b> |

**B.OPERATIONAL COST:**

| SL.No        | Description                 | Approximate Amount (Rs) |
|--------------|-----------------------------|-------------------------|
| 1            | Excavator                   | 50,00,000               |
| 2            | Tipper                      | 30,00,000               |
| 3            | Wire saw                    | 8,00,000                |
| 4            | Compressor with loose tools | 20,00,000               |
| <b>Total</b> |                             | <b>1,08,00,000</b>      |

**C. EMP COST:**

| SL.No        | Description             | Approximate Amount (Rs) |
|--------------|-------------------------|-------------------------|
| 1            | Drinking water facility | 1,00,000                |
| 2            | Safety kits             | 40,000                  |
| 3            | Water sprinkling        | 70,000                  |
| 4            | Afforestation           | 20,000                  |
| 5            | Water quality test      | 30,000                  |
| 6            | Air quality test        | 30,000                  |
| 7            | Noise / Vibration test  | 20,000                  |
| <b>Total</b> |                         | <b>3,10,000</b>         |

**Total Project Cost (A+B+C) =Rs. 2,51,30,000/-**

## 13.3.0 ENVIRONMENT MANAGEMENT PLAN

## 13.3.1 PROPOSAL FOR WASTE MANAGEMENT

The Top soil, the waste material generated during quarrying activity includes rock fragments of different sizes and waste chips (Rubble) during dressing of the blocks forms the total waste.

During the mining plan period (five years) of quarry, the total waste to be produced will be 23116m<sup>3</sup>. (refer Table - 6).

The waste management plan with reference to the quantum of waste generated (Table - 6) is shown in Mine layout plan (Plate No. VI). The wastes will be dumped in the Southern side of the lease area.

The generated top soil during the entire life of the quarry will be utilized for construction of bunds, road and afforestation purpose. The waste generated during the quarrying will be dumped in the demarcated Southern side of the lease area. Suitable specific trees to be grown over in such soil dumps will be identified with the help of agriculture experts to evolve proper afforestation plan.

## 13.3.2 PROPOSAL FOR RECLAMATION OF LAND AFFECTED BY MINING ACTIVITIES DURING &amp; AT THE END OF QUARRYING

The depth persistence of the granite body in this quarry is beyond the workable limits due to nature of occurrence of massive granite formation. In the proposed mining plan only 21m depth (1.0m topsoil + 20.0m Colour Granite) has been envisaged as workable depth for safe, systematic & economic mining. The Proposed waste will also be used for Back-filling at the end of quarry lease. The quarried out pits will be protected by providing fencing with barbed wire.

## 13.3.3 PHASED PROGRAMME OF PLANTING TREES

The essential safety distance provided along the lease boundary has been identified for dumping the Top soil wastes to maintain afforestation. Appropriate species of Neem trees will be planted in a phased manner as described below.

Table -8

| Year | No. of trees proposed to be planted | Name of the species | Survival rate expected in % | No. of trees expected to be grown |
|------|-------------------------------------|---------------------|-----------------------------|-----------------------------------|
| I    | 60                                  | Neem                | 70                          | 42                                |
| II   | 60                                  | Neem                | 70                          | 42                                |
| III  | 60                                  | Neem                | 70                          | 42                                |
| IV   | 60                                  | Neem                | 70                          | 42                                |
| V    | 60                                  | Neem                | 70                          | 42                                |



Nearly 1000Sq.m area is proposed for afforestation by planting 60 Nos. of Neem trees during every year and expected growth is around 42 no. of Neem trees at a survival rate of 70%. The afforestation plan is shown in Plate No.VI.

#### 13.3.4 MEASURES FOR DUST SUPPRESSION:

Diamond wire saw cutting will minimize the shattering effect. As the granite rocks are quarried without involving deep hole drilling and mild blasting, generation of lumps, fines and dust are negligible. This quantum of quarrying activity will not generate the dust which is detrimental to the health of the persons employed. The approach roads and waste dumps will be sprinkled with water for the suppression of air borne dust from quarry on regular intervals using water tankers. Drilling of blast holes of 32 mm dia will be always under wet conditions to prevent flying of dusts. In the unloading points, water will be sprinkled through tippers to suppress dust. The drillers are provided with respirators in accordance with the Mines Regulations.

#### 13.3.5 MEASURES TO MINIMIZE GROUND VIBRATION DUE TO BLASTING AND CHECK NOISE POLLUTION

Special care will be taken to minimize ground vibration due to blasting and check noise pollution. Shallow holes of 32mm diameter will be drilled and conventional low explosives such as gun powder, ordinary safety fuse will be used for removal of side burden. Hence ground vibration and noise pollution will be minimal and restricted with the quarry workings. The blasting will be taken up at appointed timing and with sufficient caution to the public. The noise produced by diamond wire saw cutting will be negligible.

##### 13.3.5.1 STABILIZATION AND VEGETATION OF DUMPS

There is a stable temporary dump even at higher slopes will be formed by the waste generation in the quarry which includes hard rock fragments of considerable size and irregular shape with varying angularity. To increase the stability of the sides of the waste dumps suitable soil will be brought from outside and also used for planting trees over safety zone in a phased manner as discussed in chapter 13.3.3.

#### 14.0 PROGRESSIVE MINE CLOSURE PLAN

In the Colour Granite quarry operations the maximum depth proposed is **21.0m (1m Top soil + 20.0m Colour Granite) for the entire life of quarrying operations**, this is based on the market potential at present scenario and **6.0m depth (1.0m Topsoil + 5.0m Colour Granite) during the first five year plan period.**

The waste generated during the quarrying operation is proposed to dump in the Southern side and proposed to construct safety barrier in the quarried out pits after the end of the life of the quarry period.

After completion of quarry operation the quarried out land will be fenced and maintained with barbed wire to prevent inherent entry of the public and cattle's. Garland drains will be constructed around the quarry to prevent the surface run off of the rain water.

Afforestation and Green belt development will be maintained in all the boundaries, till the trees attain the stabilize level.

Land use pattern

Table-9

| Description        | Present Area (Ha.) | Area to be required at the present Mining Plan period (Ha) | End of life of Quarrying Period (Ha.) |
|--------------------|--------------------|------------------------------------------------------------|---------------------------------------|
| Area under Quarry  | Nil                | 0.46.0                                                     | 0.73.0                                |
| Dumps              | Nil                | 0.11.0                                                     | Backfilling                           |
| Stockyard          | Nil                | Nil                                                        | Nil                                   |
| Infrastructure     | Nil                | 0.01.0                                                     | 0.01.0                                |
| Roads              | Nil                | 0.01.0                                                     | 0.01.0                                |
| Green Belt         | Nil                | 0.34.0                                                     | 0.34.0                                |
| Unutilized area    | 1.09.0             | Nil                                                        | Nil                                   |
| <b>Grand Total</b> | <b>1.09.0</b>      | <b>0.93.0</b>                                              | <b>1.09.0</b>                         |

### 15.0 MINERAL CONSERVATION AND DEVELOPMENT

The aspects of Granite Conservation and development is fully covered in this mining plan. The proposed working of the quarry to the maximum possible workable depth is focused towards the future plan. Recovery of the maximum saleable quality and quantity of Colour Granite dimensional stones is ensured by proper supervision of experienced skilled technical personals. This quality control measures propagate full utilization of the consumer requirements.

By adopting systematic and scientific quarrying special care is taken to safeguard the material quarried in an efficient and economical manner.



**16.0 STATUTORY PROVISIONS**

The provisions of the Mines Act, Rules and Regulations and orders made there under shall be complied with, so that the safety of the mine, machinery and person will be well protected. Permission, relaxation or exemption wherever required for the safe and scientific quarrying of the deposit will be obtained from the Department of Mines Safety, Chennai. Any violation pointed out by the inspecting authorities shall be rectified as per the guidelines of the department.

Certified that this Mining Plan has been Prepared in Accordance with the Mines Act, Rules and Regulations and orders made there under and also in Conformity with the Rule 8-A of TNMMCR 1959 & Rule 12 of Granite Conservation and Development Rules, 1999.

  
S.DHANASEKAR, M.Sc. (Geo)  
Qualified Person

  
COMMISSIONER  
GEOLOGY AND MINING,  
GUINDY, CHENNAI-600 032.

This Mining Plan is Approved  
Subject to the Conditions/ Stipulation  
Indicated in the Mining Plan Approval  
Letter No./ 6946/444/2023 Dated 04.23





ANNEXURE - 2

Industries (MME.2) Department,  
Secretariat, Chennai - 600 009

**Letter No.898/MME.2/2021 - 1, Dated 26.02.2021**

From

Thiru N. Muruganandam, I.A.S.,  
Principal Secretary to Government.

To

M/s. Jayran Mines,  
Door No. HIG-301,  
New Temple Land Hudco,  
Rajaji Road, Hosur Taluk,  
Krishnagiri District - 635109.



Sir,

Sub: Mines and Minerals - Minor Mineral - Colour Granite,  
Irudhukottai Village - Denkanikottai Taluk - Krishnagiri  
District - S.F.No.1160/1 (Part) - Over an extent of  
1.09.0 hectares of Government Poramboke land -  
Highest Bid amount offered by M/s. Jayran Mines,  
Krishnagiri - Precise Area Communicated - Balance  
Lease Amount - Approved Mining Plan and  
Environmental Clearance - Called for.

- Ref:
1. Krishnagiri District Gazette Extraordinary issue in English No.20 and Tamil No. 35 dated:09.10.2020.
  2. Application of Highest Bidder of M/s. Jayran Mines, Krishnagiri on 07.11.2020.
  3. Proposal of the District Collector, Krishnagiri in file No.1055/2020 (Mines), dated 20.11.2020.
  4. From the Commissioner of Geology and Mining, File Rc No.6946/MM4/2020, dated:26.01.2021 and 09.02.2021.

I am directed to state that in the references third and fourth cited, the District Collector, Krishnagiri and the Commissioner of Geology and Mining have recommended to declare you as successful bidder and to grant quarry lease for quarrying of Colour Granite over an extent of 1.09.0 hectares of Government Poramboke land in S.F.No.1160/1 (Part) in Irudhukottai Village of Denkanikottai Taluk, Krishnagiri District for a period of 20 years under rule 8-A of the Tamil Nadu Minor Mineral Concession Rules, 1959.

//p.t.o//



2. I am directed to declare you as successful bidder to grant quarry lease for quarrying of Colour Granite over an extent of 1.09.0 hectares of Government Poramboke land in S.F.No.1160/1 (Part) in Irudhukottai Village of Denkanikottai Taluk, Krishnagiri District for a period of 20 years under rule 8-A of the Tamil Nadu Minor Mineral Concession Rules, 1959 subject to the outcome of W.P.No.18317 of 2020 and W.P.No.16060/2020 and W.M.P.No.19999 of 2020. The District Collector shall comply with the directions of the Hon'ble High Court of Madras in W.P.No.18317 of 2020 and W.P.No.16060/2020 and W.M.P.No.19999 of 2020 and undertake the activities mentioned in para 3 below strictly in compliance with the directions of the Hon'ble High Court of Madras.

3. In this connection, I am directed to request you to remit the balance lease amount of Rs.1,12,00,000/-in the District Treasury concerned and to submit the original challan to Government within a period of one month from the date of this communication and to submit the approved Mining Plan as per Rule 12 of Granite Conservation and Development Rules, 1999 through the Commissioner of Geology and Mining to Government within the period of 3 months from the date of receipt of this communication as per Rule 8-A(8)(a)(ii) of the Tamil Nadu Minor Mineral Concession Rules, 1959 and also to produce Environmental Clearance obtained from the Competent Authority for the above said area as per the conditions stipulated in the prescribed Act and Rules in addition to the following conditions:-

- 1) A safety distance of 7.5 meters should be provided to the adjacent patta lands and should not cause any hindrance to them while quarrying and transportation.
- 2) A safety distance of 10 meters should be provided to the Government Poramboke land in S.F.No.1160/1(P) on the north side of the lease area.
- 3) All conditions stipulated in the District Gazette Extra ordinary notification English No.20 and Tamil No.35 dated 09.10.2020 should be adhered by the Bidder.
- 4) Environmental clearance should be obtained from the State Level Environmental Impact Assessment Authority before grant of quarry lease as per rule 42 of the Tamil Nadu Minor Mineral Concession Rules, 1959.
- 5) The applicant firm should fence the lease granted area with barbed wire before the execution of lease deed as follows: -
  - The pillar post shall be firmly grounded with concrete foundation of height not less than 2 meters with a distance between two pillars shall not be more than 3 meters.



- The applicant firm shall incorporate the DGPS readings for the entire boundary Pillars of the area and the same should be clearly shown in the mining plan.
- A soft copy of the digitized map with DGPS readings should be submitted in the CD form to the Assistant Director (i/c), Krishnagiri.



- 6) The District Administration and Geology and Mining Department should ensure the conditions imposed in G.O.(Ms).No.79, Industries Department, dated 06.04.2015.
- 7) As per Rule 12(V) of Minerals (other than Atomic & Hydrocarbon Energy Minerals) Concession Rules, 2016, the applicant firm shall at his own expenses erect, maintain and keep in repair all the boundary pillars.
- 8) The applicant firm should use mild explosives during quarrying.
- 9) Child Labourers should not be engaged in quarry works.
- 10) If any violation is found during quarrying operation, the penal provisions of the Tamil Nadu Minor Mineral Concession Rules, 1959 and other rules and act in force will attract.
- 11) The applicant firm should ensure that while starting the quarry work, all the quarry workers working under his control are registered in the Labour Welfare Board and also enrolled in the ongoing insurance scheme.
- 12) The District Collector, Krishnagiri shall obtain a sworn-in-affidavit from the applicant firm containing the above conditions before execution of lease deed and also ensure that the instructions issued in Government Letter No.12789/MMB2/2002-7, Industries Department, Dated: 9.1.2003 are complied with.
- 13) The grant of quarry lease to the applicant firm in the applied area will be based on the Judgment of Hon'ble High Court of Madras in W.P.No.18317 of 2020 and W.P.No.16060/2020 and W.M.P.No.19999 of 2020.

Yours faithfully,

*[Signature]*  
26.2.2021

for Principal Secretary to Government

*[Signature]*  
26/2/2021

**Copy to:**

The Commissioner of Geology and Mining,  
Guindy, Chennai -600 032.

✓ The District Collector,  
Krishnagiri. (for necessary followup action)

*[Signature]*  
**S.DHANASEKAR**, M.Sc.(Geo)  
Qualified Person





# KRISHNAGIRI DISTRICT GAZETTE

EXTRAORDINARY

PUBLISHED BY AUTHORITY



No. 20 ]

KRISHNAGIRI, OCTOBER 9, 2020  
(Sarvari, Purattasi 23 - Thiruvalluvar Aandu 2051)

## NOTIFICATION BY THE COLLECTOR

[Roc. No. 90/20177/(Mines), Dated: 09.10.2020]

[Notice Inviting Tender Applications for the Grant of Quarry Lease for Black/ Multi Colour Granite situated in Government land in Krishnagiri District under Tender-Cum-Auction system as per Rule 8-A of the Tamil Nadu Minor Mineral Concession Rules, 1959].

Last date and time for submission of tender application : 31.10.2020 upto 4.00 pm

Date and time on which open auction will be conducted and opening of tender application } : 02.11.2020 from 11.00 am onwards

1. For and on behalf of the Government of Tamil Nadu sealed Tender applications in Triplicate are invited by the District Collector Krishnagiri at collectorate, Krishnagiri up to 4.00 pm on 31.10.2020 (as per the office clock of the Assistant Director of Geology and Mining, Krishnagiri, Room No.30, Ground Floor, Collectorate, Krishnagiri) from the individuals or companies or partnership firms for the purpose for obtaining quarry lease to quarry black / multi color granite from the areas situated in Government lands in Krishnagiri District specified in the schedule for a period twenty years in accordance with the Tamilnadu Minor Mineral Concession Rules, 1959 more specifically as per Rule 8-A of the above said rules notified in G.O.Ms.No.103/ Industries/MMC1/Department Dt:13.07.1996 and published in Tamilnadu Government Gazette, Extraordinary No.337, part-III, section 1(a) Dt:13.07.1996 and subsequently amended.
2. The tender applications submitted as per the notification shall be in the form prescribed as per appendix VI-A of Tamil Nadu Minor mineral concession Rules, 1959. Model application form is enclosed with this gazette notification. The applications not submitted as prescribed in appendix VI-A and the applications without statutory enclosures shall not be entertained.
3. The tenderers / Bidders shall make their own arrangements to visit the notified proposed quarry sites, assess the quantity and the quality of granite before making their offers. They should also make their own arrangements for providing necessary infrastructure including approach roads, etc., for quarrying granite, if the area is allotted to them on lease eventually.





- (a) All applications made in response to this notification shall be in the form prescribed in Appendix V-A to these rules and they shall be sent directly to The District Collector, Krishnagiri District and submitted to the O/o The Assistant Director, Geology and Mining, Room No.30, Ground Floor, Collectorate, Krishnagiri on or before 4.00 PM of 31.10.2020 in person or by RPAD in a sealed cover superscribed as "TENDER APPLICATION FOR GRANT OF QUARRYING LEASE-ITEM SL.No.....IN THE NOTICE/ ADVERTISEMENT, DATED.....". The name and address of the applicant shall also be legibly written on the sealed cover. For each item of area specified in the District Gazette Notification or in the news paper advertisement separate tender application shall be made.
- b. Every tender application made for grant of quarrying lease shall be accompanied by:-
- (i) Original challan for payment of Rs.5000/- (Rupees Five Thousand only) towards non-refundable application fee in a Government Treasury in the District concerned. The amount can also be remitted through demand draft drawn in favour of the District Collector, Krishnagiri obtained from any Nationalized Bank or Co-Operative Bank and the original Demand Draft should be enclosed.
  - (ii) A demand draft for (Rs.25,00,000/-) (Rupees Twenty Five Lakhs only) towards Earnest Money Deposit in favour of the District Collector, Krishnagiri.
  - (iii) An affidavit showing the particulars of the areas mineral wise in each district of the State, which the applicant or any person jointly with him :-
    - (i). already holds under a quarrying lease
    - (ii). already applied for but not yet granted
    - (iii). is being applied for simultaneously;
    - (iv). A valid mining dues clearance certificate obtained from the Collector of the District where the quarrying or mining lease area is situated in the form prescribed in Appendix-VIII to these rules for having paid the mining dues, such as royalty, seigniorage fee, lease amount, dead rent, surface rent, area assessment, penalty amount or any other dues payable under the Act or these rules or under the lease deed or agreement already executed or entered into by the applicant if the applicant is not having any Mining/Quarrying lease in the State of TamilNadu an Affidavit towards no mining dues also to be enclosed.
  - (v). An affidavit stating that the applicant has:-
    - i. Filed upto date Income tax return.
    - ii. Paid the income tax assessed on him.
    - iii. Paid the income tax on the basis of the self assessment as provided in the Income Tax Act, 1961 (Central Act 43 of 1961) or any other later instructions of the Central Government
- (c)- The application thus made shall contain the particulars about the maximum amount the applicant is willing to offer for getting the area applied for by him on lease for quarrying purpose.
- (d) All applications shall reach the addressee specified in the notice or advertisement within the specified time and date.
5. (a) Where the application is delivered personally, its receipt shall be acknowledged in the form in Appendix-IX to the rules of TNMMCR, 1959. Where an application is sent by post it shall be sent by registered post and its receipt shall also be acknowledged to the applicant by RPAD within three days from the date of receipt of date. The District Collector shall have no responsibility for any delay in receipt or loss in postal transit of any application or communication.



- (b). If any application is made for an area when there is no invitation of application, it shall summarily be rejected as premature application. If any application is received after, the due time and date fixed for receipt of application, it shall be rejected by the District Collector as time barred application. Failure to satisfy the conditions and to comply with the requirements specified above will result in summary rejection of an application for participation in auction or tender proceedings and the person who made such application is not entitled to participate in the auction or tender as the case may be. The rejection order passed on such application with the demand draft if any shall be sent through registered post to the applicant within seven days from the date of receipt of the application retaining the application and the cover.

### TENDER - CUM - AUCTION PROCEDURE

6. (a) (i) Before opening tender applications received for each area for which applications are invited through notification and advertisement, an auction shall be conducted in which all tender applicants and also others who consider themselves as eligible and pay an Earnest Money Deposit of (Rs.25,00,000/-) by a bank draft can participate. The auction bids of the non-tender applicants will be accepted subject to verification of their eligibility and subject to their submitting the application form with statutory enclosures and payment of application fee before commencement of the tender-cum-auction proceedings. For people who have already paid Earnest Money Deposit in tender, no separate fee need be levied for participating in auction.
- (ii) In the absence of the applicant one nominee of the applicant may be permitted to participate in the auction and allowed to be present when the tender applications are opened provided the nominee produces a letter from the applicant authorising the nominee to do so and signed before a Notary Public who shall attest the signature of the applicant and his nominee.
- (b) (i) Before opening tender applications received for each area, auction shall be conducted by the District Collector or the officer authorized by the District Collector allowing all eligible applicants to bid at the auction for making their offer of lease amount to obtain the area on lease. Immediately after conclusion of the auction, all the valid tender applications for the area shall be opened and examined by the District Collector or the authorized officer.
- (ii) The sealed tender applications shall be opened in the presence of the tender applicants or their nominees who may choose to be present. Failure on the part of any tender applicant or his nominee to be present on the date and time of auction or at the time of opening of the sealed tender applications shall not prevent the authorities concerned from conducting the auction and opening of the sealed tender applications with the participation of the other tender applicants or their nominees or others.
- (iii) Where the receipt of total no. of Tender cum Auction applications are less than three, auction process shall be annulled and recommended for a retender for one time within one month.
- (iv) The authorized officer shall declare the total number of valid applications received for an area, names of the applicants and the tender amount offered for the area by each of the applicants. He shall also declare the highest bid amount offered at the auction and the highest tender amount quoted in the tender applications and the names of the highest offerers of the bid amount and the tender amount before concluding the proceedings.
- (v) In a case where the highest auction amount is found to be less than the highest tender amount and where the said highest tender amount has been quoted by two or more applicants, the District Collector or the officer authorized by the District Collector shall call such applicants alone to make their further offers.



- (vi) After declaring the name of the highest bidder/tender applicant for an area, the EMD received from the applicant bidders other than the highest bidder/tender applicant shall be returned forthwith to the applicants/bidders present on obtaining acknowledgement for receipt of the same or sent by registered post in due course, if they are not present. The Earnest Money Deposit made by the highest bid amount or tender amount offeror, as the case may be, shall be adjusted towards payment of lease amount in case he is selected for grant of the area on lease to him for quarrying purpose.

7. The District Collector after the conclusion of the Auction Cum Tender procedures, shall forward all the applications received to the State Government through the Director of Geology and Mining. On receipt of the proposal from the District Collector, the Director of Geology and Mining shall forward the same to the State Government with his recommendations.

- 8 (a) (i). On receipt of the recommendation of the Director of Geology and Mining for grant of lease for an area the State Government shall communicate its decision to grant the lease to the applicant who is declared as the successful offer or of the bid amount or Tender amount whichever is greater.

- (ii). The State Government shall communicate its decision to grant the lease for the precise area directing to remit the balance amount indicated in the order of the State Government in the District Treasury concerned and to submit the original challan to the State Government within one month from the date of receipt of such communication and to submit the approved mining plan as per Rule 12 of the Granite Conservation and Development Rules, 1999 to the State Government within a period of three months from the date of receipt of the communication from the State Government.

- (iii). Where the applicants fail to remit the balance amount within the stipulated period, the amount already remitted shall be forfeited and the communication issued, shall be deemed to be cancelled. When the said applicants have remitted the amount within the stipulated period but are not able to submit the approved mining plan as per Rule 12 of the Granite Conservation and Development Rules, 1999 to the State Government within the stipulated period for reasons beyond their control, they may apply for extension of time for submission of the approved mining plan. The State Government on receipt of such request and after satisfying that the balance amount has been paid within the prescribed period, may grant extension of time for a further period not exceeding three months, if satisfied with the reasons furnished by the applicant. In case the applicant fails to submit the approved mining plan as per Rule 12 of the Granite Conservation and Development Rules, 1999 even in the extended period, the amounts remitted by the applicant shall be forfeited and the communication letter shall be deemed to be cancelled.

- (iv). The applicant shall also submit the Environmental Clearance from the competent authority as per Rule 42 of Tamilnadu Minor Mineral Concession Rules 1959 within the time limit as prescribed by the State Government.

- (v). The applicant shall have to submit the NOC obtained from District Forest Officer, Hosur for the proposed granite quarry.

- (vi). On receipt of the approved mining plan as per Rule 12 of the Granite Conservation and Development Rules, 1999 and the Environmental Clearance from the competent authority as per Rule 42 of Tamilnadu Minor Mineral Concession Rules 1959 and NOC from the Forest Department, the State Government shall issue the order granting the lease.

- (b) Where the State Government is satisfied that the highest amount offered by the applicant is not reasonable in the circumstances of the case and that it will not be in the interest of mineral development to grant the lease to the said applicant, an order refusing to grant the lease to the applicant shall be passed by the State Government, communicating the reasons there for to the applicant.



- (c) The lease deed shall be executed by the applicant with the district Collector concerned within one month from the date of receipt of the order of the State Government or within such further period not exceeding a period of thirty days as the District Collector may allow in this behalf. The lease deed shall be executed by the applicant on the appointed day and time with a map of the demarcated leased out area signed by the District Collector and the lessee, appended to it.
- (d) Where the State Government has granted a quarrying lease, to an applicant, if the applicant fails to produce the signed copy of the demarcated map of the area or fails to produce the required stamp papers for preparing the lease deed or fails to execute the lease deed within the stipulated time, the State Government may cancel the order granting the lease to the defaulter and forfeit all amounts paid by him to the State Government. In the case of an area for which there are two or more applicants, after cancellation of the order granting the quarrying lease to the defaulter the State Government may grant the quarrying lease in favour of the next below highest bidder or tender applicant, Subject to the provision of clauses (a) and (b) If the next highest bidder or tender applicant is not communicating his acceptance of such an offer of the State Government within fifteen days from the date of receipt of the State Government's offer, the State Government shall call for fresh tender applications for the area concerned.

#### CONDITIONS FOR CARRYING OUT QUARRYING OPERATIONS.

9. (a) The date of commencement of the period for which the quarry lease is granted under this Rule shall be the date on which the lease deed is executed.
- (b) Before execution of the lease deed the successful bidder/tender applicant shall, deposit as security @ twenty percent (20%) of the bid/tender amount for which the lease has been granted by the State Government.
- (c) All the lessees, besides the onetime payment of the bid amount / tender amount which is the lease amount, shall also pay

seigniorage fee or dead rent whichever is more in respect of the actual quantity of the mineral removed or consumed at the rates prescribed from time to time in Appendix-II to these rules. Besides the onetime payment of lease amount and seigniorage fee or dead rent whichever is greater the lessee shall pay such other levies as may be prescribed by the State Government from time to time.

In the event of failure to pay the seigniorage fee or dead rent whichever is greater the lease shall be cancelled.

Provided that the lessee shall pay the dead rent for the first year of the lease before the execution of the lease deed and for the subsequent years thirty days before the date of commencement of each year of the lease period.

Provided further that the lessee is entitled to obtain transport permit and dispatch slips for removal of the mineral from the leasehold area without paying seigniorage fee until the amount of dead rent already paid is got adjusted towards seigniorage fee payment.

- (d) No lessee is entitled to raise any dispute with reference to the survey and demarcation of the area leased out to him after execution of the lease deed.
- (e) The lease shall expire on the date specified in the lease deed and in no case extension of the period of the lease shall be made.
- (f) No lessee shall commence any quarrying operation in any area without executing the lease deed. No lessee shall continue quarrying in the area after the expiry of the stipulated lease period. If any quarrying or transportation of the mineral is done without complying with or in violation of the above conditions, it shall be treated as illicit quarrying and illicit transportation and the lessee is liable to be punished for the offence without prejudice to any other actions that can be taken on the person as provided in these Rules or the Act.



- (g) The lessee shall remove and transport the mineral from the leasehold area after obtaining transport permit from the District Collector concerned or any Officer authorized by him in this behalf and complying with the other conditions stipulated in these Rules.
- (h) The lessee shall not quarry any other mineral other than the purpose for which the lease is granted. If, any other mineral / valuable metal is found to be noticed, the quarrying operation shall be stopped at once and intimated to the District Collector / Government.
- (i) The lessee shall not without the previous consent in writing of the State Government assign, sublet, mortgage or in any other manner transfer the quarrying lease as specified in Rule-36F of Tamil Nadu Minor Mineral Concession Rule 1959.
- (j) The lessee shall keep correct accounts showing the quantity and other particulars of all minerals quarried and transported from the quarry site. The lessee shall also allow any officer authorized by the State Government or the Director of Geology and Mining or the District Collector in this behalf to inspect the quarry and verify the records and accounts and to furnish such information and returns as may be required by him.
10. (a) The lessee shall carryout the quarrying operations in a skilful, scientific and systematic manner keeping in view the proper safety of the labour, conservation of minerals and preservation of the environment and ecology of the area.
- (b) The lessee shall allow any officer authorized by State Government, or the Director of Geology and Mining, or the District Collector concerned to enter upon the leasehold area and inspect for the purpose mentioned in clause (a) and for any other purpose which may be required for compliance of the provisions of the Act and these rules or any other Act or Rules framed by the Central Government or the State Government.
11. The lease granted under this rule may be renewed for a period not exceeding twenty years, provided that renewal of lease shall be subject to the satisfactory performance of the lessee in the past in fulfilling the conditions of lease and as per the other rule provisions of Tamil Nadu Minor Mineral Concession Rules 1959.

## 12. CONDITIONS

1. The period for which the area granted on lease for quarrying under this rules is only for twenty years.
2. The quarrying lease will be granted only in the name of the successful Tenderer/bidder declared by the state Government.
3. No quarrying activities commenced there to shall be done before the execution of the agreement.
4. The Executed lease deed shall be registered at the cost of the lessee.
5. While quarrying no hindrance shall be caused to the adjoining pattadars and public.
6. The lessee should restrict his mining operations strictly within the permitted area as defined in the sketch without any encroachments.
7. The lessee should maintain, at his cost proper signboards indicating the survey numbers, years of lease, name of the lease holder and lease period to the satisfaction of the District Collector and Commissioner/ Director of Geology and Mining and maintain it all time at the quarry site.
8. The lessee should make his/her own arrangement to form the approach road from the public road to the place of the quarry.
9. The lessee shall abide to all the provisions of Mines and Minerals (Development and Regulation) Act, 1957, The Metalliferous Mines Regulations 1961 or any other connected Laws including Forest (Conservation) Act, 1980, Forest Conservation Rules, 1981, Environment Protection Act, 1980, Indian Explosives Act 1884, (Central Act IV of 1884) and the Rules made there under and the Tamil Nadu Minor Minerals Concession Rules, 1959.

*[Handwritten signature]*



10. Quarry lease area should be demarcated state on ground with wire fencing to show the boundary of the lease area on all sides with red flags on every pillar with DGPS reading shall be erected before commencement of quarrying and it should be maintained throughout the period of lease.
11. No quarrying shall be made within the safety distance of 7.5 mts to the adjacent patta lands and 10 mts to the adjacent Government Poramboke land.
12. Pit Mouth register should be maintained in the quarry site.
13. A minimum distance of 50 mts. from any Civil structure/ habitation, Electric / Telephone lines, Railway line, Reservoir canal, National highways and other public works shall be kept from the periphery of any excavation area and 10mts safety distance to the village roads shall be kept and maintained during the entire lease period.
14. Quarry operations shall be carried only after appointing Mines Manager/Mines Mate and it should be carried out on the supervision of Mines Manager/Mines Mate.
15. Notice of opening of the quarry should be sent to the Director of Mines safety, Bangalore.
16. In any accident occur in the quarry area the lessees should give intimation to the Director of Mines safety Bangalore and District Collector, Krishnagiri at once and lessee is solely responsible for any violation.
17. The lessee should get the consent for establishment and for operation from the Tamil Nadu Pollution Control Board before the commencement of quarrying operation.
18. The conditions imposed by the TNPCB in the consent order should be adhered without any omission.
19. The Environmental clearance and the consent of the TNPCB should be renewed periodically without any lapse.
20. If any quarrying is found in the area granted on lease before the date of execution of lease deed, the lease is liable to be cancelled and criminal action will be initiated.
21. No lease granted under this rule shall be extended.
22. The lessee shall provide safety distance in the area as per the rules in force or any rule which may be imposed by Government. He must also take up all safety measures as directed by the Government at his own cost.

### 13. SPECIAL CONDITIONS

1. The Government reserves the right to accept or reject any or all tender / bid applications either in part or in full without any liability to the Government or any of the officers of the Government.
2. The authority for acceptance of tender / bid shall rest with the Government. The Government do not bind themselves to accept the highest or any other tender / bid applications.
3. The applicants participating in the tender / bid either should have (or) shall obtain a valid Permanent Account Number issued by the Income Tax department of Government of India.
4. The successful bidder shall pay 2% on the total tender / bid amount into the TAN number CHEDO5905E as TDS to IT Department and produce the remittance challan to the Assistant Director of Geology and Mining, Krishnagiri.
5. After execution of the lease deed the lessees shall have to pay as 2% on the seigniorage fee as TDS to Income Tax Department on the total Seigniorage Fee paid for the total volume of transportation at the time of obtaining transport permit.
6. The lessee shall pay 10% of the total amount of the seigniorage fee paid for obtaining transport permit towards the contribution of Krishnagiri District Mineral Foundation Trust Fund and the said amount should be remitted to current account number 37243080996 @ the State Bank of India, Krishnagiri Branch then and there without fail.



7. Transportation of Black Granite/ Colour Granite blocks should not be carried out from 6.00 P.M to 6.00 A.M.

8. The lessee shall strictly adhere to the statutory and safety requirements.

9. The waste materials generated during quarrying operation shall be dumped only within the area granted under lease.

10. Quarrying shall be done as per the approved Mining Plan and as such laws made by the Central Government/State Government and any other notifications issued then and there.

11. The lessee/grantee shall submit scheme of mining, mine closure plan and other statutory requirements within the time stipulated for submission of the above as per rules.

12. The lessee shall submit half yearly returns in form 'F' and Annual returns in Form 'G' as per GCDR 1999 within the prescribed time limit.

13. The lessee should strictly adhere all the conditions imposed by the state Government, in the lease granting order, conditions imposed in the Environmental Clearance certificate, conditions imposed by the Director of Geology and Mining, the District Collector, Krishnagiri and any other directions / instructions issued from time to time.

14. Any other conditions stipulated by other Statutory/Government authorities shall be complied with.

#### 14.SCHEDULE

#### KRISHNAGIRI DISTRICT

Areas notified for lease under Tender-Cum-Auction as per Rule 8-A of Tamil Nadu Minor Mineral Concession Rules, 1959.

| Sl. No | Taluk  | Village          | S.F. No.       | Extent Proposed for lease (in hecets.) | Classification of land | Mineral        |
|--------|--------|------------------|----------------|----------------------------------------|------------------------|----------------|
| (1)    | (2)    | (3)              | (4)            | (5)                                    | (6)                    | (7)            |
| 1      | Bargur | Pasinayana palli | 73(P)          | 4.25.0                                 | Parai                  | Black Granite  |
| 2      | Bargur | Guttur           | 362/1(P) BIT-1 | 1.02.0                                 | Kallankuthu            | Black Granite  |
| 3      | Bargur | Guttur           | 362/1(P) BIT-2 | 1.42.0                                 | Kallankuthu            | Black Granite  |
| 4      | Bargur | Guttur           | 309(P)         | 1.64.0                                 | Kallankuthu            | Black Granite  |
| 5      | Bargur | Guttur           | 397/1 & 404/1  | 2.80.0                                 | Kallankuthu UAW        | Black Granite  |
| 6      | Bargur | Pasinayana palli | 10(P)          | 3.46.0                                 | UAW Parai              | Colour Granite |
| 7      | Bargur | Modikuppam       | 121(P)         | 2.52.0                                 | UAW                    | Colour Granite |

| (1) | (2)            | (3)                | (4)              | (5)    | (6)         | (7)            |
|-----|----------------|--------------------|------------------|--------|-------------|----------------|
| 8   | Bargur         | Shoolamalai        | 333(P)           | 1.98.0 | UAW         | Colour Granite |
| 9   | Bargur         | Ikondam kothapalli | 337/1(P)         | 2.54.0 | Karadu      | Colour Granite |
| 10  | Bargur         | Puligunda          | 345(P)<br>BIT-1  | 1.28.0 | Kallankuthu | Colour Granite |
| 11  | Bargur         | Puligunda          | 345(P)<br>BIT-2  | 1.78.0 | Kallankuthu | Colour Granite |
| 12  | Bargur         | Jagadevi palayam   | 366(P)           | 1.87.0 | UAW Parai   | Colour Granite |
| 13  | Pocham palli   | Nagojana halli     | 609A(P)<br>BIT-1 | 2.92.0 | UAW Malai   | Colour Granite |
| 14  | Pocham palli   | Nagojana halli     | 609A(P)<br>BIT-2 | 4.10.0 | UAW Malai   | Colour Granite |
| 15  | Pocham palli   | Nagojana halli     | 609A(P)<br>BIT-3 | 3.23.0 | UAW Malai   | Colour Granite |
| 16  | Pocham palli   | Nagojana halli     | 609A(P)<br>BIT-4 | 1.80.0 | UAW Malai   | Colour Granite |
| 17  | Pocham palli   | Nagojana halli     | 609A(P)<br>BIT-5 | 1.54.0 | UAW Malai   | Colour Granite |
| 18  | Denkani kottai | Irudhu kottai      | 1160/1<br>(Part) | 1.09.0 | Podukal     | Colour Granite |

Krishnagiri,  
09-10-2020.

**V. JAYA CHANDRA BHANU REDDY,**  
District Collector,  
Krishnagiri District.

  
**S. DHANASEKAR**, M.Sc., (Geo)  
Qualified Person

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## ANNEXURE - III

வனம் கமிஷன்

வனம் பெறுவோம்

## தமிழ்நாடு வனத்துறை

அனுப்பதல்

திரு. தீபக் எஸ். பீல்கி, இலய,  
வன உயிரின காப்பாளர்,  
மத்திகிரி, ஓரூர் - 635 110.  
தொலைபேசி எண். 04344-262259.

பெறுதல்

மாவட்ட ஆட்சித் தலைவர்,  
கிருஷ்ணகிரி மாவட்டம்,  
கிருஷ்ணகிரி.

ந.க.எண்.5279/2019-எல் நாள். 27.11.2019

(ஸ்ரீ லிங்கா லுடம், கார்த்திகை 11, திருவள்ளூர் ஆண்டு 2050)

அப்பா,

**பொருள் :** கனிமங்களும் குவாரிகளும் - சிறுகனிமம் - கிரானைட் கற்கள் - கிருஷ்ணகிரி மாவட்டத்தில் அரசு புறம்போக்கு நிலங்களில் உள்ள கிரானைட் கற்கள் வெட்டியெடுக்க டெண்டருடன் இணைந்த ஏலமுறையில் குவாரி குத்தகை வழங்குதல் குறித்து வனத்துறையின் தடைமின்மைச் சான்று கோருதல் - வனத்துறை நோக்கிலான கருத்து தெரிவித்தல்-தொடர்பாக.

**பார்வை :** 1. மாவட்ட ஆட்சித் தலைவர், கிருஷ்ணகிரி மாவட்டம் ந.க.எண். 90/2017/கனிமம் நாள்.20.05.2019.  
2. வனச்சரக அலுவலர், தேன்கனிக்கோட்டை சரகம் ந.க.எண்.178/2019 நாள்.13.11.2019.  
3. வனச்சரக அலுவலர், கிருஷ்ணகிரி சரகம் ந.க.எண்.560/2019 நாள்.25.11.2019.

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பார்வை 1-ல் கண்ட கிருஷ்ணகிரி மாவட்ட ஆட்சித் தலைவர் அவர்களது கடிதத்தில், கிருஷ்ணகிரி மாவட்டத்தில் உள்ள அரசு புறம்போக்கு நிலங்களில் கிரானைட் கற்கள் வெட்டி எடுக்க டெண்டர் / பொது ஏலம் மூலம் குத்தகைக்கு வழங்க, வனத்துறை நோக்கிலான கருத்தும் மற்றும் வனத்துறையின் தடைமின்மை சான்று வழங்க வேண்டி கேட்கப்பட்டுள்ளது.

மேற்படி மனு மீது நடவடிக்கை எடுக்கும் பொருட்டு, கிருஷ்ணகிரி வனச்சரக அலுவலரால் 25.11.2019ந்தேதியும் மற்றும் தேன்கனிக்கோட்டை வனச்சரக அலுவலரால் 13.11.2019ந்தேதியும் சரக பணியாளர்களுடன் தணிக்கை மேற்கொண்டு அறிக்கை சமர்ப்பித்துள்ளனர்.

கிருஷ்ணகிரி மற்றும் தேன்கனிக்கோட்டை வனச்சரக அலுவலர்கள் அறிக்கைகளின் அடிப்படையில், கிரானைட் கற்கள் வெட்டி எடுக்க டெண்டர் / பொது ஏலம் மூலம் குத்தகைக்கு வழங்க அனுமதி கோரியுள்ள பகுதிகளை வன உயிரின காப்பாளரால், சரக பணியாளர்களுடன் தணிக்கை செய்யப்பட்டதில், கீழ்க்கண்ட அட்டவணை 1-ல் உள்ள குவாரிப் பகுதிகளுக்கு கிரானைட் கற்கள் வெட்டி எடுக்க டெண்டர் / பொது ஏலத்தில் குத்தகைக்குவிட கீழ்க்கண்டவாறு இவ்வனுபலகத்தின் கருத்து தெரிவிக்கப்படுகிறது.



i) கிராண்ட் கற்குவாரி குத்தகை வழங்க ஒப்பந்தம் செய்வதற்கு (Lease deed agreement) முன்பு ஒவ்வொரு குவாரிப் பகுதிக்கும் தனித்தனியாக வளத்துறையின் நிபந்தனை மற்றும் குறிப்புகளுடன் முன் அனுமதி பெற்றப்பின் குவாரிப் பணி செய்ய பணி ஆணை (Work order) வழங்கப்பட வேண்டும்.

ii) காவேரி வடக்கு வன உயிரின சரணாலயத்திற்கான Eco Sensitive Zone எல்லை நிர்ணயம் செய்ய பிரேரிக்கப்பட்டு ஆணை எதிர்நோக்கியுள்ள சூழலில், மேற்படி கிராண்ட் கற்குவாரி குத்தகை கோரும் புலங்கள் காவேரி வடக்கு வன உயிரின சரணாலய எல்லையிலிருந்து 10 கி.மீ-க்குள் அமைந்திருப்பின் தேசிய வன உயிரின வாரியத்தின் முன் அனுமதி (National Board for Wildlife) பெறப்பட வேண்டும்.

iii) மலைதள பாதுகாப்பு பரிந்துரை குழு (Hill Area Conservation Authority)-ன்படி அறிவிக்கை செய்யப்பட்ட கிராம எல்லைக்குள் கற்குவாரி பணி செய்ய அனுமதி கோரியுள்ள புலங்கள் அமைந்திருப்பின், மலைதள பாதுகாப்பு பரிந்துரை குழு (Hill Area Conservation Authority)-ன் கீழ் முன் அனுமதி பெறப்படவேண்டும்.

iv) கிராண்ட் கற்கள் வெட்டி எடுக்க டெண்டர் / பொது ஏலத்தில் குத்தகைக்குவிட அனுமதி கோரும் புலங்கள் வருவாய்த்துறை ஆவணங்களில் "காடு" என வகைப்படுத்தப்பட்ட புலங்களில் கற்குவாரிப் பணிசெய்யஅனுமதிக்கக் கூடாது.

v) கிராண்ட் கற்கள் வெட்டி எடுக்க டெண்டர் / பொது ஏலத்தில் குத்தகைக்குவிட அனுமதி கோரும் புலங்கள் தமிழ்நாடு வனச்சட்டம் 1882-ன் பிரிவு 4 மற்றும் 16-ன் கீழ்காப்பு நிலம் / காப்புக்காடு என அறிவிக்கை செய்யப்பட்ட புலங்களாக இருத்தல் கூடாது.

vi) கிராண்ட் கற்கள் வெட்டி எடுக்க டெண்டர் / பொது ஏலத்தில் குத்தகைக்குவிட அனுமதி கோரும் புலங்கள் தமிழ்நாடு வனச்சட்டம் 1882-ன் பிரிவு 26-ன் கீழ் அறிவிக்கை செய்யப்பட்ட புலங்களாக இருத்தல்கூடாது.

vii) கிராண்ட் கற்கள் வெட்டி எடுக்க டெண்டர் / பொது ஏலத்தில் குத்தகைக்குவிட அனுமதி கோரும் புலங்கள் காப்புக்காட்டின் எல்லைக்கு அருகில் அமைந்திருப்பின், Standing Orders of the Board of Revenue- volume - I Section III, Sub-Section 38 (III) வருவாய் வாரிய நிலை ஆணை தொகுப்பு 1, பிரிவு 3, உட்பிரிவு 38 (III)-ன்படி காப்புக்காட்டிற்கு அருகில் உள்ள நிலத்தில் இதர பயன்பாட்டிற்கு உட்படுத்த நடவடிக்கை மேற்கொள்ளப்படும் போது காப்புக் காட்டின் எல்லையிலிருந்து குறைந்தபட்சம் 60 மீட்டர் (3 Chain) தொலைவிற்கு அப்பாற்பட்டிருக்க வேண்டும் என்ற நிபந்தனையை கடைபிடிக்கப்பட வேண்டும்.

viii) அரசாணை (நிலை) எண்.79 தொழில் (கனிமம் 1) துறை நாள்.06.04.2015-ல் குறிப்பிட்டுள்ள நிபந்தனைகளை மாவட்ட நிர்வாகம் / கனிம வளத்துறை கவனத்தில் கொள்ளவேண்டும்.



## அட்டவணை - 1

கிராமணர் கற்கள் வெட்டி எடுக்க டெண்டருடன் இணைந்த ஏலமுறை வழங்க பரிந்துரை செய்யப்படும் குவாரிப் பகுதிகள் விபரம்

| Sl. No. | Taluk         | Village            | Survey Number    | Propoed area (In Ha) |
|---------|---------------|--------------------|------------------|----------------------|
| 1       | BARGUR        | PASINAYANAPALLI    | 10(P) ✓          | 3.69.0 ✓             |
| 2       | BARGUR        | MODIKUPPAM         | 121(P) ✓         | 2.85.0 ✓             |
| 3       | BARGUR        | SHOOLAMALAI        | 333(P) ✓         | 200.0 ✓              |
| 4       | BARGUR        | IKONDAM-KOTHAPALLI | 337/1(P) Bit 2   | 2.54.0 ✓             |
| 5       | BARGUR        | PULIGUNDA          | 345(P) BIT-1     | 1.67.0 ✓             |
| 6       | BARGUR        | PULIGUNDA          | 345(P) BIT-2     | 1.78.0 ✓             |
| 7       | BARGUR        | JAGADEVIPALAYAM    | 366(P) ✓         | 1.87.0 ✓             |
| 8       | BARGUR        | PASINAYANAPALLI    | 73(P) ✓          | 4.25.0 ✓             |
| 9       | BARGUR        | GUTTUR             | 309(P) ✓         | 2.50.0 ✓             |
| 10      | BARGUR        | GUTTUR             | 362/1(P) BIT-1 ✓ | 1.02.0 ✓             |
| 11      | BARGUR        | GUTTUR             | 362/1(P) BIT-2 ✓ | 1.62.0 ✓             |
| 12      | BARGUR        | GUTTUR             | 397/1 & 404/1 ✓  | 2.80.0 ✓             |
| 13      | POCHAMPALLI   | NAGOJANAHALLI      | 609A(P) BIT-1 ✓  | 2.92.0 ✓             |
| 14      | POCHAMPALLI   | NAGOJANAHALLI      | 609A(P) BIT-2 ✓  | 4.10.0 ✓             |
| 15      | POCHAMPALLI   | NAGOJANAHALLI      | 609A(P) BIT-3 ✓  | 3.23.0 ✓             |
| 16      | POCHAMPALLI   | NAGOJANAHALLI      | 609A(P) BIT-4 ✓  | 1.80.0 ✓             |
| 17      | POCHAMPALLI   | NAGOJANAHALLI      | 609A(P) BIT-5 ✓  | 1.54.0 ✓             |
| 18      | DENKANIKOTTAI | IRUDHUKOTTAI       | 1160             | 3.06.0 ✓             |

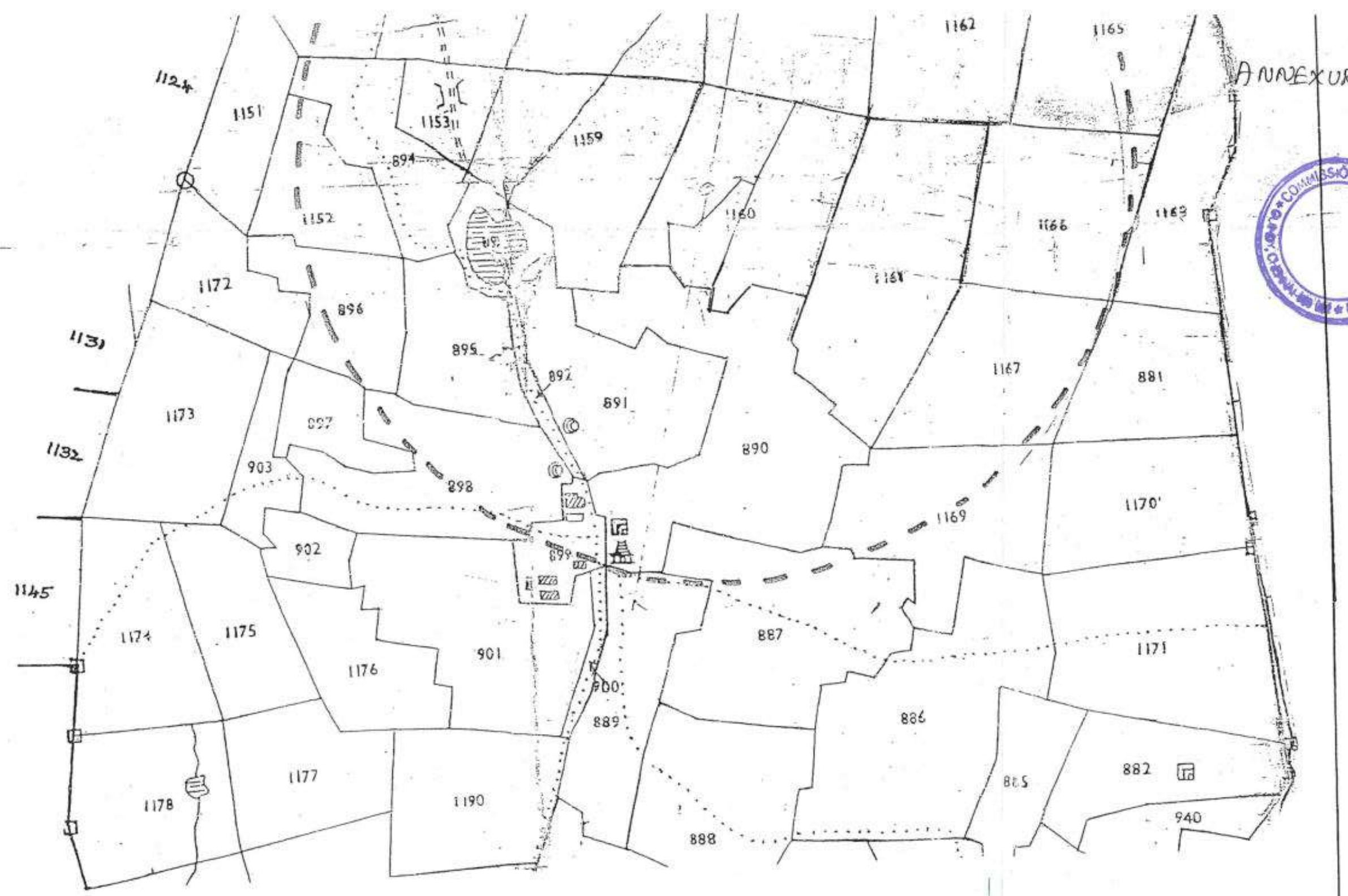
கீழ்க்கண்ட அட்டவணை 2-ல் குறிப்பிடப்பட்டுள்ள பகுதிகளில் குவாரிப் பணி செய்ய டெண்டருடன் இணைந்த ஏலமுறையில் விடுவதை தற்போது நிறுத்திவைக்கலாம் என்பதை தெரிவித்துக்கொள்கிறேன்.

## அட்டவணை - 2

கீழ்க்கண்ட பகுதிகளில் கிராமணர் கற்கள் வெட்டி எடுக்க டெண்டருடன் இணைந்த ஏலமுறை விடுவதை தற்போது நிறுத்திவைக்கலாம்

| Sl. No. | Taluk       | Village            | Survey Number  | Propoed area (In Ha) |
|---------|-------------|--------------------|----------------|----------------------|
| 1       | BARGUR      | MODIKUPPAM         | 143/2(P)       | 1.60.0               |
| 2       | BARGUR      | IKONDAM-KOTHAPALLI | 337/1(P) Bit 1 | 2.96.0               |
| 3       | POCHAMPALLI | NAGOJANAHALLI      | 642(P)         | 1.00.0               |
| 4       | UTHANGARAI  | KUNNATHUR          | 220/1 & 220/2  | 1.89.0               |





கூலி கற்கள் உடைக்கி உருமம்  
கோடும்படுத்.

ச. சிவசுந்தரி  
FIRKA SURVEYOR  
DENKANIKOTTA

S. DHANASEKAR, M.Sc. (Geo)  
Qualified Person



|   |               |                  |              |        |
|---|---------------|------------------|--------------|--------|
| 5 | DENKANIKOTTAI | HANUMANTHA-PURAM | 287          | 1.62.0 |
| 6 | DENKANIKOTTAI | HANUMANTHA-PURAM | 288/4        | 1.73.0 |
| 7 | DENKANIKOTTAI | THAVAKARAI       | 348(P) BIT-1 | 2.50.0 |
| 8 | DENKANIKOTTAI | THAVAKARAI       | 348(P) BIT-2 | 2.50.0 |
| 9 | DENKANIKOTTAI | THAVAKARAI       | 348(P) BIT-3 | 2.50.0 |

மேற்கண்ட அட்டவணை 1-ல் கண்ட இணங்களுக்கு மட்டும் டெண்டர் / பொது ஏலத்தில் குத்தகைக்குவிட மட்டுமே தடையில்லாச் சான்று தற்போது அளிக்கப்படுகிறது. ஒவ்வொரு குவாரிப் பகுதிகளுக்கும் வனத்துறையின் மூலம் தனித்தனியாக தணிக்கை மேற்கொண்டு, அதற்கேற்ப சட்ட திட்டங்களுக்கு உட்பட்டு, மாண்புமிகு உச்சநீதி மன்ற ஆணைகளை கடைபிடிக்க (Compensatory planting), மனித - வன விலங்கு மோதல்கள் மற்றும் மாக கட்டுப்பாடு போன்றவற்றை கருத்தில்கொண்டு வனத்துறையின் கருத்துகள் மற்றும் நிபந்தனைகளை பெற ஒவ்வொரு குத்தகைக்கும் தனித்தனியாக விண்ணப்பிக்க வேண்டும் என்பதை அன்புடன் தெரிவித்துக்கொள்கிறேன்.

தங்கள் அன்புள்ள,  
ஒம்/-தீபக் எஸ். பில்கி,  
வனஉயிரின காப்பாளர்,  
ஒரூர் வனக்கோட்டம்.

//உ.ந.உ.ப//

கண்காணிப்பாளர் 27/11/19

27/11/19

S.DHANASEKAR, M.Sc., (Geo)  
Qualified Person



# ஆம் பரணியில் உதவுகிறீர்கள்  
மாஸ்டர் ஜார்ஜ் என்.எம்.  
மாஸ்டர் ஜார்ஜ் என்.எம்.  
மாஸ்டர் ஜார்ஜ் என்.எம்.

பிரபலக் கணக்கு

Figure 2

கிராமத்தில் வருடவாசி புலவாரி கைப்பற்று சாகுபடி அடங்கல் கணக்கு

[illegible][illegible]

35-1 0906 1 0911

3-06-70



KU 2009  
240

சிறிய பிரவாக அலுவலர்  
41 இரும்பு கோட்டி (இராமல்)  
தேன்களிக்கோட்டை வட்டம்



|      | 2  | 3      | 4 | 5   | 6   | 7   | 8       | 9                  | 10     | 11   | 12                       |
|------|----|--------|---|-----|-----|-----|---------|--------------------|--------|------|--------------------------|
|      |    |        |   |     |     |     | கு. பை. | தொ. ஏ. சி. கு. பை. |        |      |                          |
| 1159 | 1  | 1159-1 | ர | ய   | ... | 8-5 | 12      | 0 62               | 1 70-0 | 1 05 | 1794 சின்னப்பா.          |
|      | 2A | -2பா   | ர | ய   | ... | 8-5 | 12      | 0 62               | 1 15-0 | 0 71 | 759 மு. பேளா<br>ளப்பா.   |
|      | 2B | -2பா   | ர | ய   | ... | 8-5 | 12      | 0 62               | 0 95-5 | 0 59 | 215 மு. கோவித்<br>தப்பா. |
|      | 3  | -3     | ர | ய   | ... | 8-5 | 12      | 0 62               | 0 36-5 | 0 23 | 1606 முத்தம்மா.          |
|      |    |        |   |     |     |     |         |                    | 4 17-0 | 2 58 |                          |
| 1160 | 1  | 1160-1 | அ | ய   | ... | 8-5 | 12      | 0 62               | 3 06-0 | 1 55 | பே. குகால்               |
|      | 2  | -2     | அ | யுற | ... | ... | ...     | ...                | 0 12-0 | ...  | பா. குகால்               |
|      | 3  | -3     | ர | ய   | ... | 8-5 | 12      | 0 62               | 0 84-5 | 0 52 | 1796 சவுப்பா.            |
|      | 4  | -4     | ர | ய   | ... | 8-5 | 12      | 0 62               | 0 11-5 | 0 13 | 536 மா. திமி<br>ராயப்பா. |
|      | 5  | -5     | ர | ய   | ... | 8-5 | 12      | 0 62               | 0 60-5 | 0 66 | 990 முனிகாமி.            |
|      |    |        |   |     |     |     |         |                    | 4 74-5 | 2 86 |                          |
| 1161 | 1  | 1161-1 | ர | ய   | ... | 8-4 | 10      | 1 09               | 0 79-5 | 0 86 | 736 பெருமக்கா.           |
|      | 2  | -2     | ர | ய   | ... | 8-4 | 10      | 1 09               | 1 21-5 | 1 32 | 1038 முத்தப்பா.          |
|      | 3  | -3     | ர | ய   | ... | 8-4 | 10      | 1 09               | 0 43-5 | 0 48 | 736 பெருமக்கா.           |
|      | 4  | -4     | ர | ய   | ... | 8-4 | 10      | 1 09               | 1 00-0 | 1 09 | 437 சென்றாயப்பா.         |
|      | 5  | -5     | ர | ய   | ... | 8-4 | 10      | 1 09               | 0 14-5 | 0 15 | 315 மு. முனியப்பா.       |
|      | 6  | -6     | அ | ய   | ... | 8-4 | 10      | 1 09               | 0 33-0 | 0 36 | ..... போகூல்             |
|      | 7  | -7     | ர | ய   | ... | 8-4 | 10      | 1 09               | 0 29-5 | 0 32 | 438 சென்னப்பா.           |
|      | 8  | -8     | ர | ய   | ... | 8-4 | 10      | 1 09               | 0 56-0 | 0 61 | 734 பெள்ளுரப்பா.         |
|      |    |        |   |     |     |     |         |                    | 4 77-5 | 5 19 |                          |
| 1162 | 1  | 1162-1 | ர | ய   | ... | 8-4 | 10      | 1 09               | 0 94-5 | 1 02 | 1033 முனிலக்கமி.         |
|      | 2  | -2     | ர | ய   | ... | 8-4 | 10      | 1 09               | 0 45-5 | 0 49 | 543 திம்மராயப்பா.        |
|      | 3  | -3     | ர | ய   | ... | 8-4 | 10      | 1 09               | 0 78-0 | 0 85 | 1038 முத்தப்பா.          |
|      | 4  | -4     | ர | ய   | ... | 8-4 | 10      | 1 09               | 1 14-0 | 1 25 | 1396 வெங்கடேசன்.         |
|      | 5  | -5     | ர | ய   | ... | 8-4 | 10      | 1 09               | 0 49-5 | 0 54 | 888 மாரியப்பன்.          |
|      | 6  | -6     | ர | ய   | ... | 8-4 | 10      | 1 09               | 0 32-5 | 0 35 | 1622 மு. ராஜம்மா.        |
|      |    |        |   |     |     |     |         |                    | 4 14-0 | 4 50 | சென்னை                   |

S. DHANASEKAR, M.Sc. (Geo)  
Qualified Person

சிராமநாதன் அழகன்  
41, இரத்தின கோட்டை (கிராமம்)  
கேள்வனியில்லை





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ANNEXURE - VII



## FORM C

[See rule 9(a)]

## Acknowledgement of Registration of Firms

The Registrar of Firms, TamilNadu, hereby acknowledges the receipt of the statement prescribed by Section 58(1) of the Indian Partnership Act, 1932. The statement has been filed and the name of the firm **JAYRAN MINES** has been entered in the Register of Firms as No FR/Krishnagiri/180/2020.



Date 28-11-2020

Station : Krishnagiri



Digitally Signed by Thiru/ Tmt/ Selvi

SENTHILKUMAR VELMURUGAN

Registrar of Firms

செந்தில்குமார் வெல்முருகன்

29/11/2020

S.DHANASEKAR, M.Sc. (Geo)  
Qualified Person

29/11/2020





தமிழ்நாடு தமில்நாடு TAMILNADU

Rs. 100/-

Jayman Mines  
Hosur

Date: 27.07.2020

CA 077600

C. Shanmuga Sundaran

Stamp Vendor L.No:17/2009/KC  
HOSUR - 635 109. (T.N.)

### PARTNERSHIP DEED

This deed of Partnership Deed is made on 27<sup>th</sup> day of July, 2020 between:-

1. Mr. V.JAYAPRAKASH S/o. VENKATESHNAIDU, aged about 54 years, Residing at D NO HIG 301, New Temple Land Hudco, Rajaji Road Phase 10, Hosur-635109, Krishnagiri district. Adhar No. (2593 8465 0800) Hereinafter referred to as Party of the FIRST PART)
2. Mr. J.NAVARATHAN S/o. JAYAPRAKASH, aged about 21 years, Residing at D NO HIG 301, New Temple Land Hudco, Rajaji Road Phase 10, Hosur-635109, Krishnagiri district. Adhar No. (4841 8291 6432) Hereinafter referred to as Party of the the SECOUND PART).

*[Signature]*

*J. Navarathan*

*[Signature]*





தமிழ்நாடு தமில்நாடு TAMILNADU

Rs.

100/-

Date

27-07-2020

Jayran Mines  
Hosur

CA 077601

C. Shanmuga Sundara

Stamp Vendor L.No:17/2009/K  
HOSUR - 635 109. (T.N)

WHEREAS the aforesaid parties intend to carry on the business in the name and style of M/s JAYRAN MINES., of GRANITES, BLOCK EXPORTS or any other Business which may be advantageous to the firm from time to time as mutually decided by the partners.

AND WHEREAS it is deemed expedient and necessary to reduce into writing the terms and conditions upon which the partners have agreed to carry on the business.

NOW THIS DEED OF PARTNERSHIP WITNESS AS FOLLOWS:

1. NAME OF THE FIRM:

The name and style of the Partnership shall be that of M/s. "JAYRAN MINES."

*[Signature]*

*[Signature]*

*[Signature]*





தமிழ்நாடு தமில்நாடு TAMILNADU

Rs. 100/-

Date: 27-07-2020

Jayaram Mines  
Hosur

CA 077602  
Shanmuga Sundar  
Stamp Vendor L.No:17/2009  
HOSUR - 635 109. (T)

## 2. PRINCIPAL PLACE OF BUSINESS :

The principal place of business shall be at Hosur and the business of partnership shall be carried on at the address D NO HIG 301, NEW TEMPLE LAND HUDCO, RAJAJI ROAD PHASE 10, HOSUR-635109. KRISHNAGIRI (DT), Tamilnadu or the partners by mutual consent may change the place of business to any other place or places from time to time. The partners can open new branches, extend and close any of the offices.

## 3. COMMENCEMENT AND DURATION OF THE FIRM:

That partnership business shall be deemed to have come into force with effect from the date of this deed and continue for the period at the partners and it shall be a partnership at "WILL"

## 4. BUSINESS OF THE FIRM:

The partnership business shall that of GRANITES, BLOCKS EXPORTS or any other Business which may be advantageous to the firm from time to time as decided by the partners

*[Signature]*

*[Signature]*

*[Signature]*



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## 5. CAPITAL OF THE FIRM:

The initial capital of the Firm shall be Rs. 10, 00,000 (Rupees Ten Lakhs Only) which shall be contributed by all the partners as follows. Additional capital whenever required is to be contributed by the partners equally. The capital contributed by the partners shall carry interest @ 12% per annum.

|                      |               |                 |
|----------------------|---------------|-----------------|
| 1) Mr. V.JAYAPRAKASH | (First Part)  | Rs. 9,00,000/-  |
| 2) Mr. J.NAVARATHAN  | (Second Part) | Rs. 1,00,000 /- |



The net Profits or Losses of the Firm arrived after deducting interest and Salary Payable to the partners shall be shared among the Partners in the following Ratio:

|               |               |     |
|---------------|---------------|-----|
| V.JAYAPRAKASH | (First Part)  | 90% |
| J.NAVARATHAN  | (Second Part) | 10% |

## 6. REMUNERATION TO PARTNERS :

- The Salary for all the partners will be Rs: 10,000/- per month.
- In case of insufficient profits, the salary to partners shall be allowed to the extent of profits available. The salary may be increased or decreased as mutually agreed by the partners time to time.
- However the salary so payable shall not exceed the limits prescribed under the Income Tax Act, 1961.

## 7. MANAGEMENT AND ADMINISTRATION :

All the partners shall be active partners and look after the day-to-day affairs of the firm. All the partners are jointly on behalf of the firm are hereby authorized to borrow money from banks, financial institutions, companies or any other persons or shall act as mutually agreed upon themselves. Documents, loan papers shall be executed by the partners jointly and all the partners are severally and jointly liable to repay the borrowed money.

## 8. ACCOUNTING YEAR :

That the account of the firm shall be made up annually as on the 31<sup>st</sup> day of March in every year and profit and loss account and Balance Sheet shall be audited by a Chartered Accountant.

*U. Jeyaprasad*

*J. Navarathnan*

*U. Jeyaprasad*

## 9. BOOKS OF ACCOUNT :

The partners shall keep proper accounts and documents of the firm. The books of accounts, documents and registers relating to the firm, shall be kept in the office of the firm. The partners are entitled to inspect and take copies of the Books of accounts during the hours.

## 10. BORROWING POWERS :

The firm shall borrow funds from any Nationalized Bank or Scheduled Bank or Financial Institutions for the purpose of the business and such borrow shall be binding on the firm.

## 11. BANK ACCOUNT :

The firm shall open Bank accounts in the name of the partnership firm shall be open at Hosur in one or more of Nationalized / Scheduled / commercial Bank and shall be operated by the First Part Only on behalf of the firm.

## 12. RETIREMENT OF THE PARTNERS :

Any partner can retire at any time by giving three months notice in advance and the amount standing to the credit of the outgoing partner shall be paid within a period of three months from the date of his retirement by the continuing partner. The retiring partner shall have no claim on the goodwill of the firm.

## 13. TRANSFER OF RIGHTS :

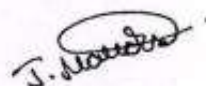
No partner shall without the previous consent in writing of the other partners sign, transfer or mortgage his share or interest in the partnership or introduce any person as partner with him therein.

## 14. PRIVATE DEBTS OF PARTNERS :

The private debts of any partners shall not bind to the firm.

## 15. INDEMNITY BY PARTNERS :

Every partner shall indemnify the firm for any loss or damage caused to it by his / her fraud willful neglect or misconduct in the conduct of the business of the firm out of his / her private assets or from out of the balance due from the firm in his account.




**16. CONTINGENCY :**

On the death of any partner, nominee, successors, or legal representatives of the deceased as the case may be, by mutual consent of the existing partners, be admitted into the partnership. In case of dissolution of the firm, the assets and liabilities of the firm shall be divided in their capital ratio.

**17. ALTERATION :**

That the partners may by mutual consent amend, alter or delete any of the above clauses or add new clauses to this deed of partnership.

**18. ARBITRATION :**

That the dispute if any, among the partners out of this partnership or on interpretation, operation or enforcement of the terms of this partnership shall be referred to arbitration and settled as per the Arbitration Act, 1940.

**19. PARTNERSHIP ACT:**

For the term and conditions not specifically mentioned above, the terms and conditions as laid down in the Indian Partnership Act, 1932 shall apply.

**20. MANAGING PARTNER**

Mr. V.JAYAPRAKASH partner No.1 Partners shall be the "Managing Partner" of the firm. He is authorized to maintain all the accounts the firm and communicate with the officials and others to obtain necessary permissions for buying / selling / exporting and importing of goods and is authorized to sign necessary documents of all the transactions and is eligible to remit and receive the funds in the bank and other activities of the firm.

IN WITNESS WHEREOF THE PARTNERS above mentioned have signed this deed of partnership at Hosur on the date, month and year above mentioned.

1. Mr. V.JAYAPRAKASH

*[Signature of V. Jayaprakash]*

Party of the First Part

2. Mr. J.NAVARATHAN

*[Signature of J. Navarathan]*

Party of the Second Part

*[Signature]*



## WITNESSES: -

1. S. A. S. S/Ameen S/o Siddanna  
Hosur.

2. R. Srinivasan R. SRINIVASAN S/o A. RAJENDRAN  
THIRUPATTER



  
S. DHANASEKAR, M.Sc. (Geo)  
Qualified Person





தகவல்

- 1. அடாஹர் அடையாளத்திற்கான சான்று குடியரிமைக்கு அல்ல.
- 2. பாதுகாப்பான QR குறியீடு ஆப்ஸைன் XL : ஆன்லைன் அங்கீகாரத்தைப் பயன்படுத்தி அடையாளத்தை சரிபார்க்கவும்.
- 3. இது எலக்ட்ரானிக் செயல்முறை மூலம் தயாரிக்கப்பட்ட கடிதமாகும்.

#### INFORMATION

- 1. Aadhaar is a proof of identity, not of citizenship.
- 2. Verify identity using Secure QR Code/ Offline XML/ Online Authentication.
- 3. This is electronically generated letter.

- 1. அடாஹர் நாடு முழுவதிலும் செல்லுபடியாகும்.
- 2. பல்வேறு அரசு மற்றும் அரசு சார்பு சேவைகளை எளிதில் பெற அடாஹர் உதவுகிறது.
- 3. உங்கள் மொபைல் எண் மற்றும் மின்னஞ்சல் இடையை அடாஹர் மூலப்பிக்கவும்.
- 4. அடாஹர் - செல்லியைப் பயன்படுத்தி உங்கள் ஸ்மார்ட் போனில் ஆதாரை எடுத்துச் செல்லுங்கள்.

- 1. Aadhaar is valid throughout the country.
- 2. Aadhaar helps you avail various Government and non-Government services easily.
- 3. Keep your mobile number & email ID updated in Aadhaar.
- 4. Carry Aadhaar in your smart phone - use Aadhaar App.



இந்த தகவல், மட்டுமன்றி ஆதாரை அடையாளம்  
Unique Identification Authority of India

முகவரி:  
S/O: வெங்கடேசுதாசு, கான் ஓர் ஐ டீ  
301, புது டெம்பிள் லாண்ட் ஹூட்கோ, ராஜாஜி  
ரோடு பிளஸ் 10, ஹசுர், கிருஷ்ணகிரி,  
தமிழ் நாடு - 635109

Address:  
S/O: Venkateshnaidu, D NO H I G 301, NEW  
TEMPLE LAND HUDCO, RAJAJI ROAD  
PHASE 10, HOSUR, Hosur, Krishnagiri,  
Tamil Nadu - 635109



2593 8465 0800

VID : 9118 7179 1619 2813

1947 | help@uidai.gov.in | www.uidai.gov.in



ANNEXURE-IX



305

பதிவேட்டு எண்/ Enrolment No.: 2192/50344/55906

To  
ஜெயபிரகாஷ் வெங்கடேசுதாசு  
Jayaprakash Venkateshnaidu  
S/O: Venkateshnaidu  
D NO H I G 301  
NEW TEMPLE LAND HUDCO  
HOSUR  
RAJAJI ROAD PHASE 10  
Hosur  
Hosur  
Krishnagiri Tamil Nadu - 635109  
9443221375

Download Date: 24/02/2020  
Issue Date: 18/02/2020

Signature valid



உங்கள் ஆதார எண் / Your Aadhaar No. :

2593 8465 0800

VID : 9118 7179 1619 2813

எனது ஆதார, எனது அடையாளம்



Government of India

Download Date: 24/02/2020



ஜெயபிரகாஷ் வெங்கடேசுதாசு  
Jayaprakash Venkateshnaidu  
பிறந்த நாள்/DOB: 25/05/1966  
ஆண்/ MALE

Issue Date: 18/02/2020

2593 8465 0800

VID : 9118 7179 1619 2813

எனது ஆதார, எனது அடையாளம்





Government of India

நவரத்தன் ஜெயபிரகாஷ்  
Navarathan Jayaprakash  
பிதர் : ஜெயபிரகாஷ்  
Father : Jayaprakash

பிறப்பு நாள்: 12/10/1999  
பாலினம் : Male

4841 8291 6432

Unique Identification Authority of India

முகவரி : ஸ்ரீ. ஜெயபிரகாஷ்  
கான் ஸ்ரீ ஐ.ஜி.ஓ. 301  
நியூ டெம்பிள் லாண்ட் ஹூட்கோ  
ராஜாஜி ரோடு பிளஸ் 10,  
ஹோசூர், ஹோசூர், ஹோசூர்,  
கிருஷ்ணா மாவட்டம், தமிழ்நாடு  
635109

Address: S. Jayaprakash,  
D NO H I G 301, NEW  
TEMPLE LAND HUDCO,  
RAJAJI ROAD PHASE 10,  
HOSUR, Hosur, Hosur,  
Krishnagiri Tamil Nadu,  
635109

4841 8291 6432

ஆதார - சாதாரண மனிதனின் அதிகாரம்



1200 303 1047



help@uidai.gov.in



www.uidai.gov.in

*J. Navarathan*



*S. Dhanasekar*  
**S.DHANASEKAR, M.Sc.,(Geo)**  
Qualified Person

*15/2/2000*



அறிவியல் புலம்

FACULTY OF SCIENCE



பெரியார் பல்கலைக்கழக ஆட்சிக்குழு 2003 ஆம் ஆண்டு ஏப்ரல் மாதம்  
 நடந்த பயன்பாட்டு புவியமைப்பியல் தேர்வில்  
 S தனசேகர் என்பவர்  
 முதல் வகுப்பில் தேர்ச்சி பெற்றார் என்று தக்க தேர்வாளர்கள்  
 சான்றளித்தபடி அறிவியல் நிறைஞர் என்னும்  
 பட்டத்தை அவருக்குப் பல்கலைக்கழக இலச்சினையுடன் வழங்குகிறது.

*The Syndicate of the Periyar University hereby makes known*  
*that* **DHANASEKAR 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** *at the*  
*Examination held in* **APRIL 2003**



Given under the seal of this University

நாள்

Dated 15-09-2004

சேலம் 636011, தமிழ்நாடு, இந்தியா  
 Salem 636011, TamilNadu, India.

*[Signature]*  
 பதினாள்  
 Registrar

*[Signature]*  
 துணைவேந்தர்  
 Vice-Chancellor

*[Signature]*  
**S.DHANASEKAR, M.Sc. (Geo)**  
 Qualified Person



ANNEXURE - XI

**PRITHVI MINERALS,**

☎ : 04288 - 262489

VARANALLAMPALAYAM,  
ALATHUR POST - 637 303.  
SANKARI Tk, Salem Dt. Tamil Nadu

Date : 15.11.10

TO WHOMSOEVER IT MAY CONCERN

This is to certify that Shri. S. DHANASEKAR, S/o. Shri. A. Sundaram residing at No. 8/3, Kullappan Street, Omalur Taluk, Salem District - 636 455 is working in our mines from 15.10.2003 to 05.07.2005 as Part time Geologist. From 06.07.2005 to till date he is working as Full time Geologist. During the above tenure of service his execution of the assigned work is exemplary and worth mentioning.

We wish him success in his future endeavors.

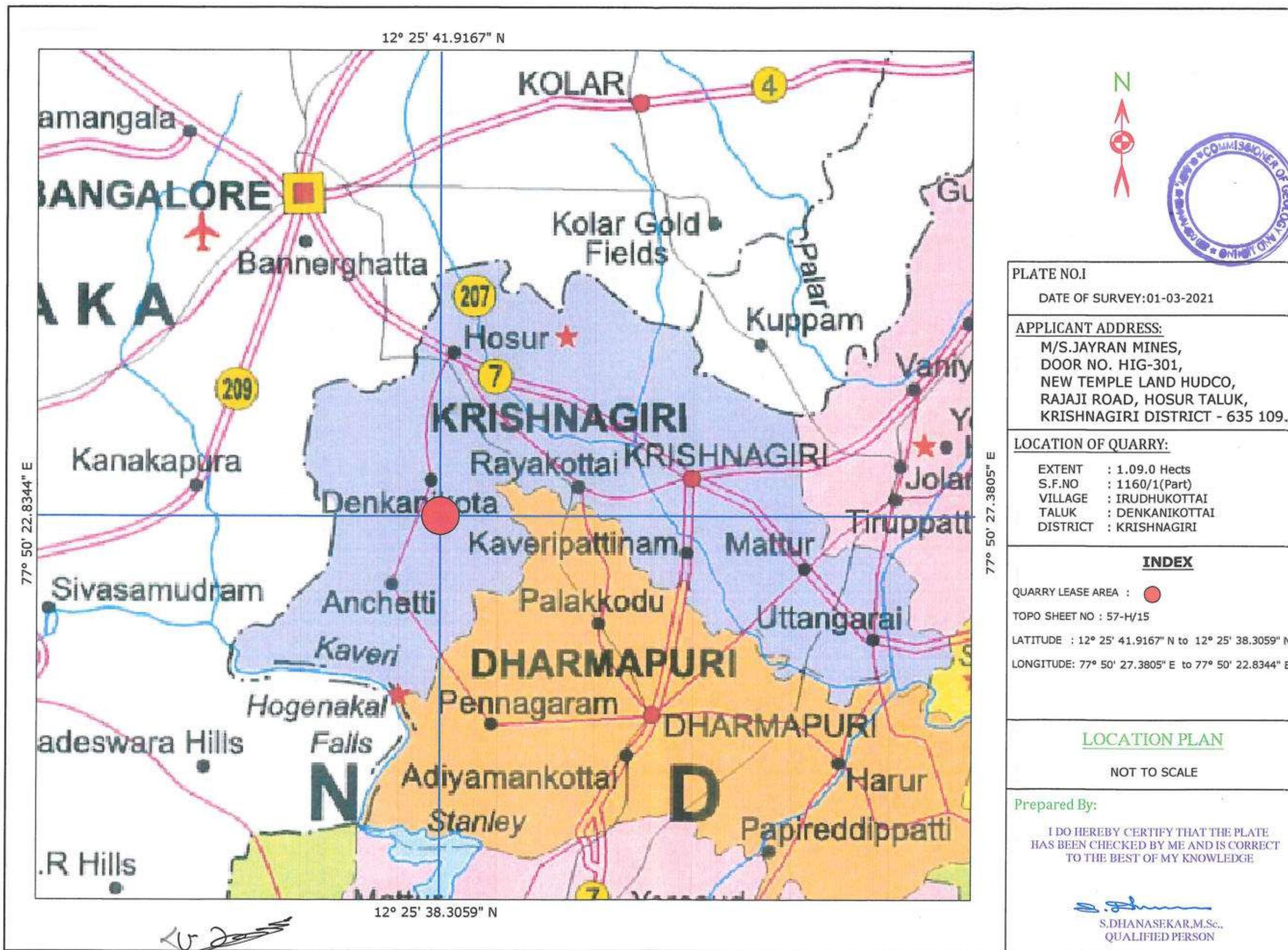
for PRITHVI MINERALS,

(T. P. THIAGAVEL)

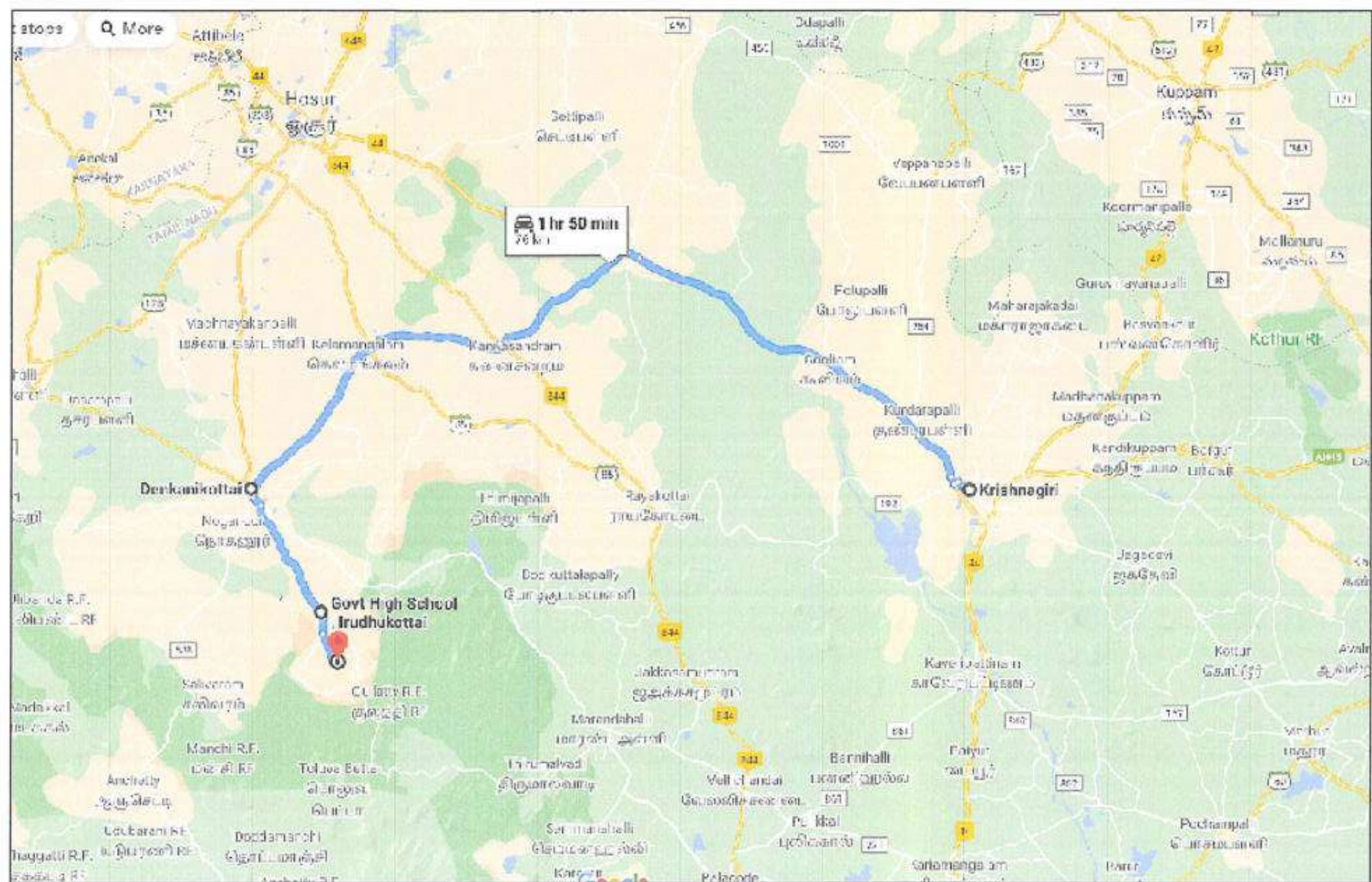
Partner

S. DHANASEKAR, M.Sc. (Geo)  
Qualified Person







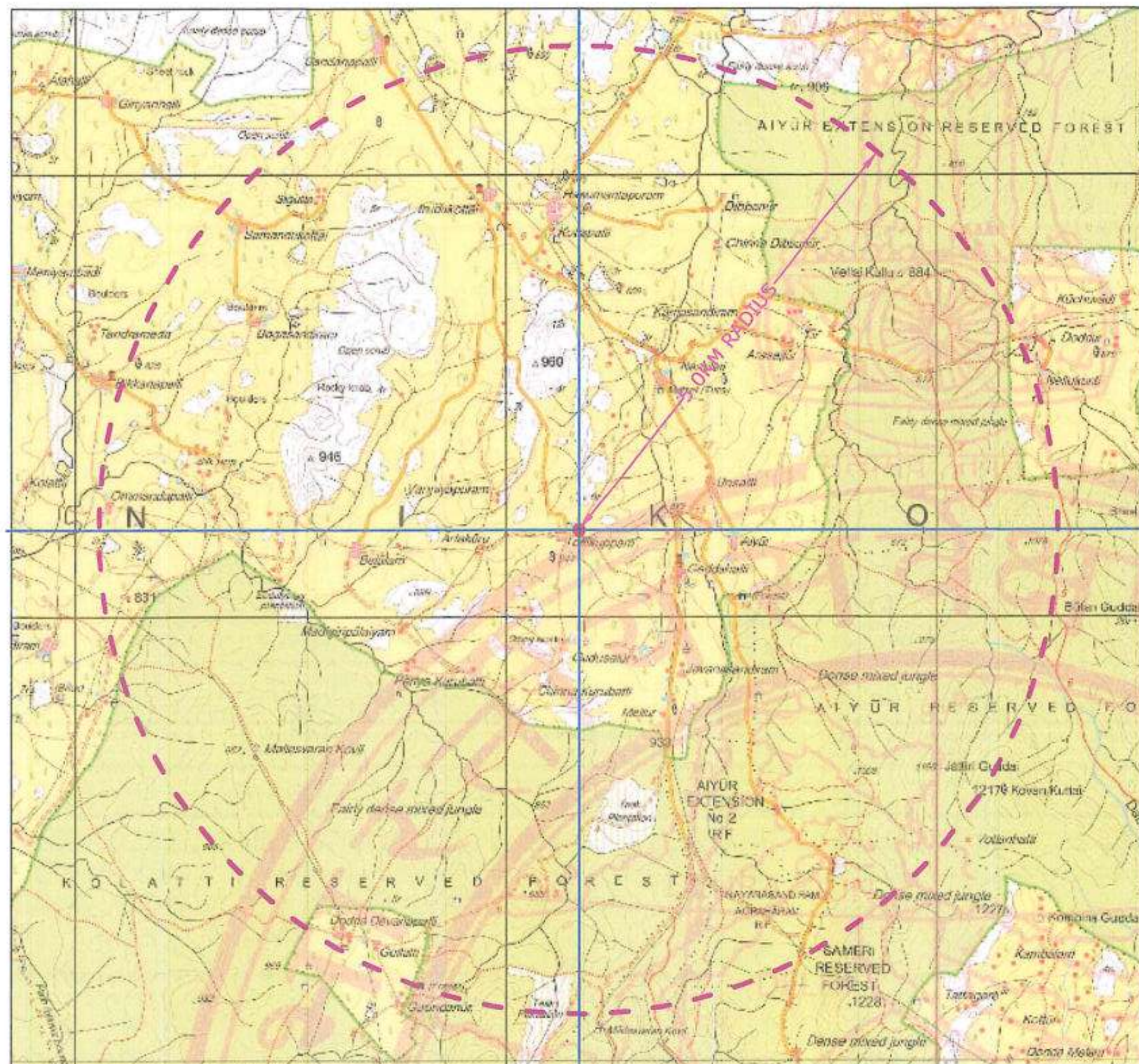


|                                                                                                                                                                                                                                                                               |  |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|
| <b>PLATE NO.1A</b>                                                                                                                                                                                                                                                            |  |
| DATE OF SURVEY:01-03-2021                                                                                                                                                                                                                                                     |  |
| <b>APPLICANT ADDRESS:</b><br>M/S.JAYRAN MINES,<br>DOOR NO. HIG-301,<br>NEW TEMPLE LAND HUDCO,<br>RAJAJI ROAD, HOSUR TALUK,<br>KRISHNAGIRI DISTRICT - 635 109.                                                                                                                 |  |
| <b>LOCATION OF QUARRY:</b><br>EXTENT : 1.09.0 Hects<br>S.F.NO : 1160/1(Part)<br>VILLAGE : IRUDHUKOTTAI<br>TALUK : DENKANIKOTTAI<br>DISTRICT : KRISHNAGIRI                                                                                                                     |  |
| <b>INDEX</b><br>QUARRY LEASE AREA : <br>ROAD                                                        |  |
| <b>KEY MAP/ROUTE MAP</b><br>NOT TO SCALE                                                                                                                                                                                                                                      |  |
| <b>Prepared By:</b><br><br>I DO HEREBY CERTIFY THAT THE PLATE<br>HAS BEEN CHECKED BY ME AND IS CORRECT<br>TO THE BEST OF MY KNOWLEDGE<br><br><br>S.DHANASEKAR,M.Sc.,<br>QUALIFIED PERSON |  |

Handwritten signature/initials in black ink.



12° 25' 41.9167" N



77° 50' 22.8344" E

77° 50' 27.3805" E

12° 25' 38.3059" N

PLATE NO. JB

DATE OF SURVEY: 01-03-2021

APPLICANT ADDRESS:

M/S. JAYRAN MINES,  
DOOR NO. HIG-301,  
NEW TEMPLE LAND HUDCO,  
RAJAJI ROAD, HOSUR TALUK,  
KRISHNAGIRI DISTRICT - 635 109.

LOCATION OF QUARRY:

EXTENT : 1.09.0 Hects  
S.F.NO : 1160/1(Part)  
VILLAGE : IRUDHUKOTTAI  
TALUK : DENKANIKOTTAI  
DISTRICT : KRISHNAGIRI

INDEX

MINE LEASE AREA



5.0KM RADIUS



TOPO SHEET NO : 57-H/15

LATITUDE : 12° 25' 41.9167" N to 12° 25' 38.3059" N

LONGITUDE: 77° 50' 27.3805" E to 77° 50' 22.8344" E



TOPOSHEET MAP

NOT TO SCALE

Prepared By:

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HAS BEEN CHECKED BY ME AND IS CORRECT  
TO THE BEST OF MY KNOWLEDGE

  
S. DHANASEKAR, M.Sc.,  
QUALIFIED PERSON





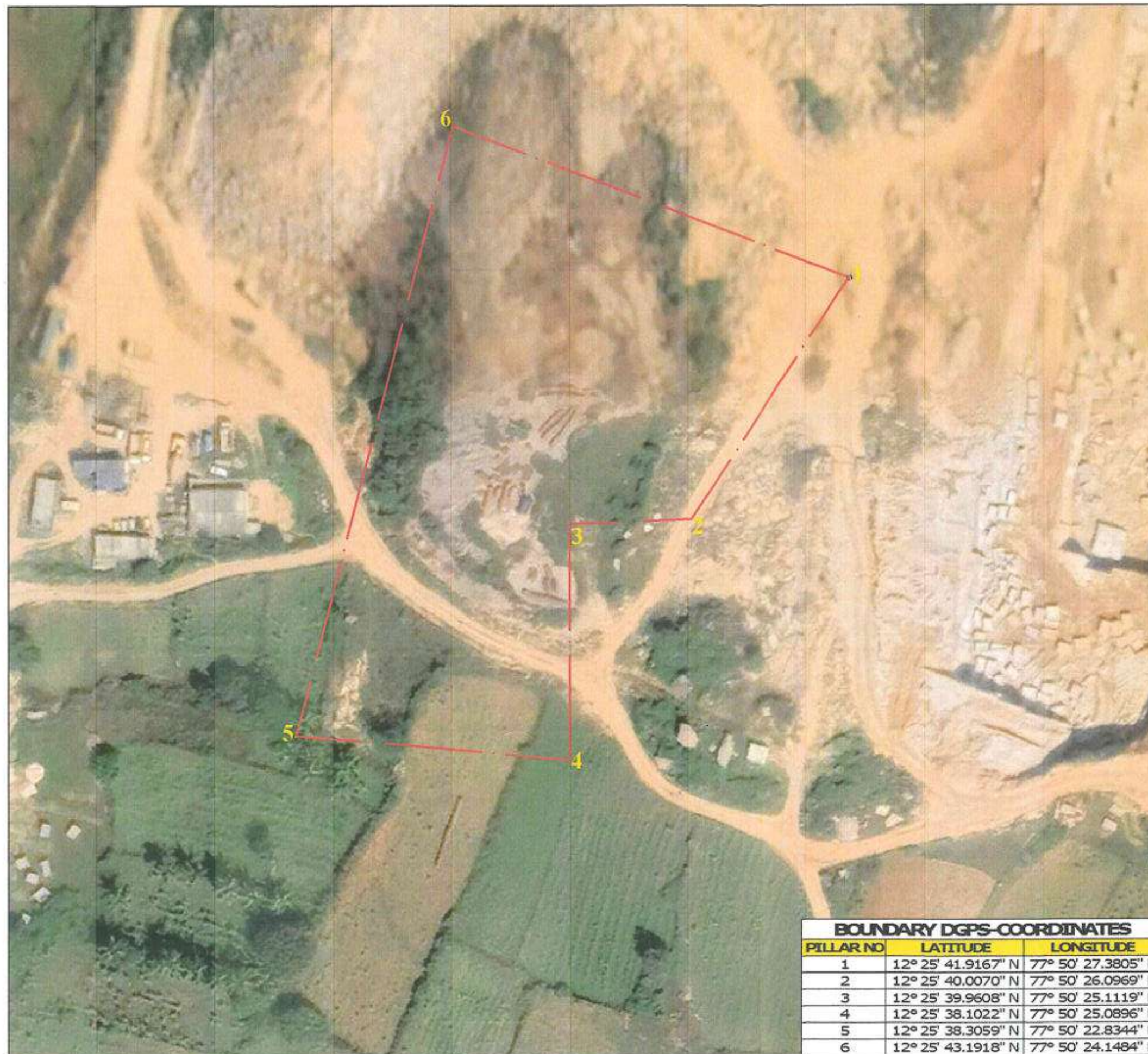


PLATE NO.IC

DATE OF SURVEY:01-03-2021

APPLICANT ADDRESS:

M/S.JAYRAN MINES,  
DOOR NO. HIG-301,  
NEW TEMPLE LAND HUDCO,  
RAJAJI ROAD, HOSUR TALUK,  
KRISHNAGIRI DISTRICT - 635 109.

LOCATION OF QUARRY:

EXTENT : 1.09.0 Hects  
S.F.NO : 1160/1(Part)  
VILLAGE : IRUDHUKOTTAI  
TALUK : DENKANIKOTTAI  
DISTRICT : KRISHNAGIRI

INDEX

QUARRY LEASE BOUNDARY



SATELLITE IMAGE  
(LEASE AREA)

SCALE : 1: 1000

Prepared By:

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

S.DHANASEKAR,M.Sc.,  
QUALIFIED PERSON



12° 25' 43.1918" N  
77° 50' 24.1484" E



12° 25' 38.3059" N  
77° 50' 22.8344" E

12° 25' 41.9167" N  
77° 50' 27.3805" E

12° 25' 38.1022" N  
77° 50' 25.0896" E



PLATE NO.ID

DATE OF SURVEY:01-03-2021

**APPLICANT ADDRESS:**

M/S.JAYRAN MINES,  
DOOR NO. HIG-301,  
NEW TEMPLE LAND HUDCO,  
RAJAJI ROAD, HOSUR TALUK,  
KRISHNAGIRI DISTRICT - 635 109.

**LOCATION OF QUARRY:**

EXTENT : 1.09.0 Hects  
S.F.NO : 1160/1(Part)  
VILLAGE : IRUDHUKOTTAI  
TALUK : DENKANIKOTTAI  
DISTRICT : KRISHNAGIRI

**INDEX**

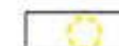
QUARRY LEASE BOUNDARY



500m RADIUS



300m RADIUS



**SATELLITE IMAGE**  
(500m RADIUS)

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

  
S.DHANASEKAR,M.Sc.,  
QUALIFIED PERSON



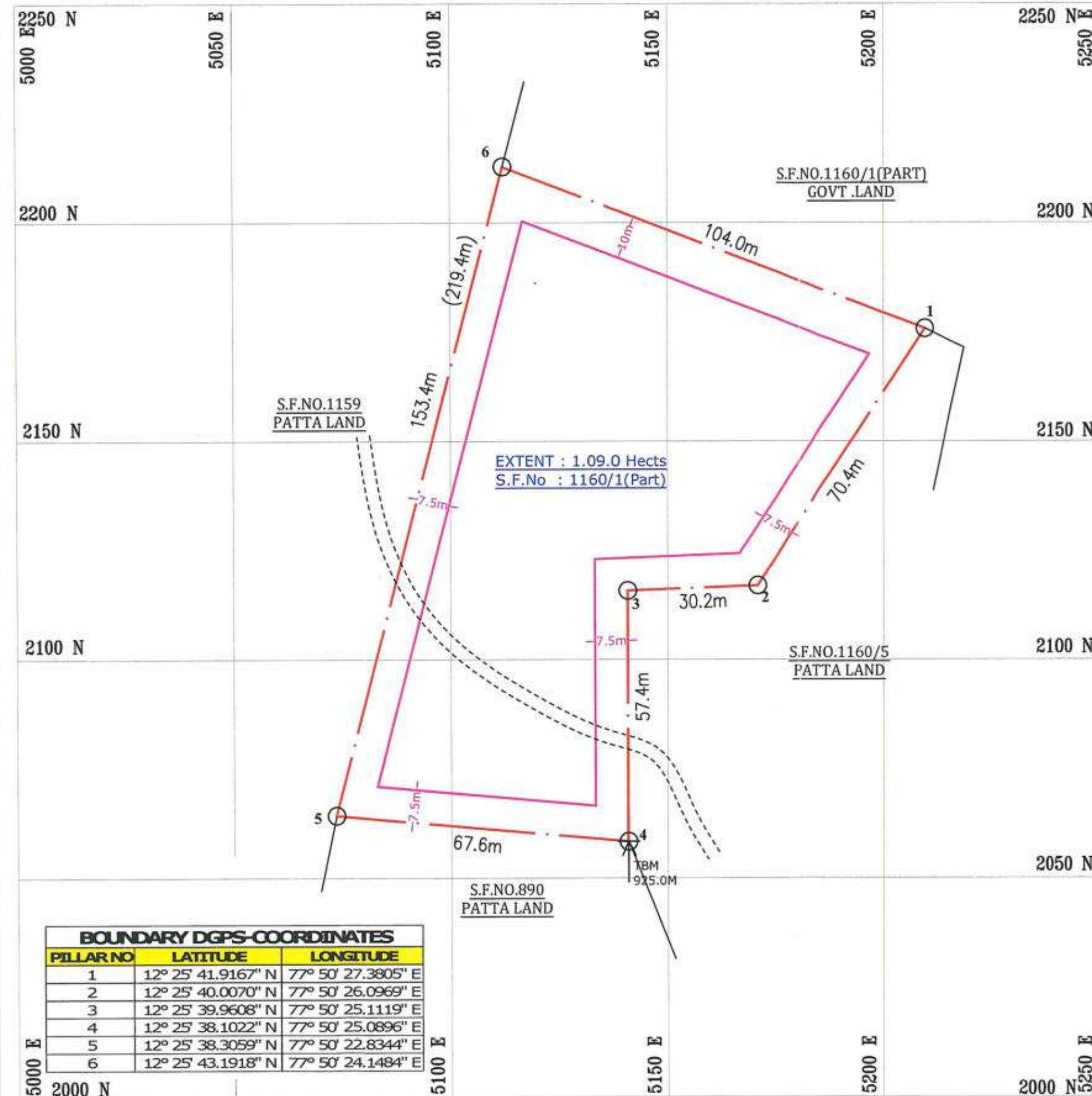


PLATE NO.II

DATE OF SURVEY:01-03-2021

APPLICANT ADDRESS:

M/S.JAYRAN MINES,  
DOOR NO. HIG-301,  
NEW TEMPLE LAND HUDCO,  
RAJAJI ROAD, HOSUR TALUK,  
KRISHNAGIRI DISTRICT - 635 109.

LOCATION OF QUARRY:

EXTENT : 1.09.0 Hects  
S.F.NO : 1160/1(Part)  
VILLAGE : IRUDHUKOTTAI  
TALUK : DENKANIKOTTAI  
DISTRICT : KRISHNAGIRI

### INDEX

|                             |  |
|-----------------------------|--|
| QUARRY LEASE BOUNDARY       |  |
| 7.5m & 10m BOUNDARY BARRIER |  |
| TEMPORARY BENCH MARK        |  |
| APPROACH ROAD               |  |

### MINE LEASE PLAN

SCALE 1:1000

Prepared By:

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

S.DHANASEKAR,M.Sc.,  
QUALIFIED PERSON





**PLATE NO.III**

DATE OF SURVEY:01-03-2021

**APPLICANT ADDRESS:**  
M/S.JAYRAN MINES,  
DOOR NO. HIG-301,  
NEW TEMPLE LAND HUDCO,  
RAJAJI ROAD, HOSUR TALUK,  
KRISHNAGIRI DISTRICT - 635 109.

**LOCATION OF QUARRY:**

EXTENT : 1.09.0 Hects  
S.F.NO : 1160/1(Part)  
VILLAGE : IRUDHUKOTTAI  
TALUK : DENKANIKOTTAI  
DISTRICT : KRISHNAGIRI

**INDEX**

|                             |  |
|-----------------------------|--|
| QUARRY LEASE BOUNDARY       |  |
| 7.5m & 10m BOUNDARY BARRIER |  |
| TEMPORARY BENCH MARK        |  |
| TOP SOIL                    |  |
| COLOUR GRANITE              |  |
| CONTOUR LINE                |  |
| QUARRY ROAD                 |  |
| SHRUB                       |  |

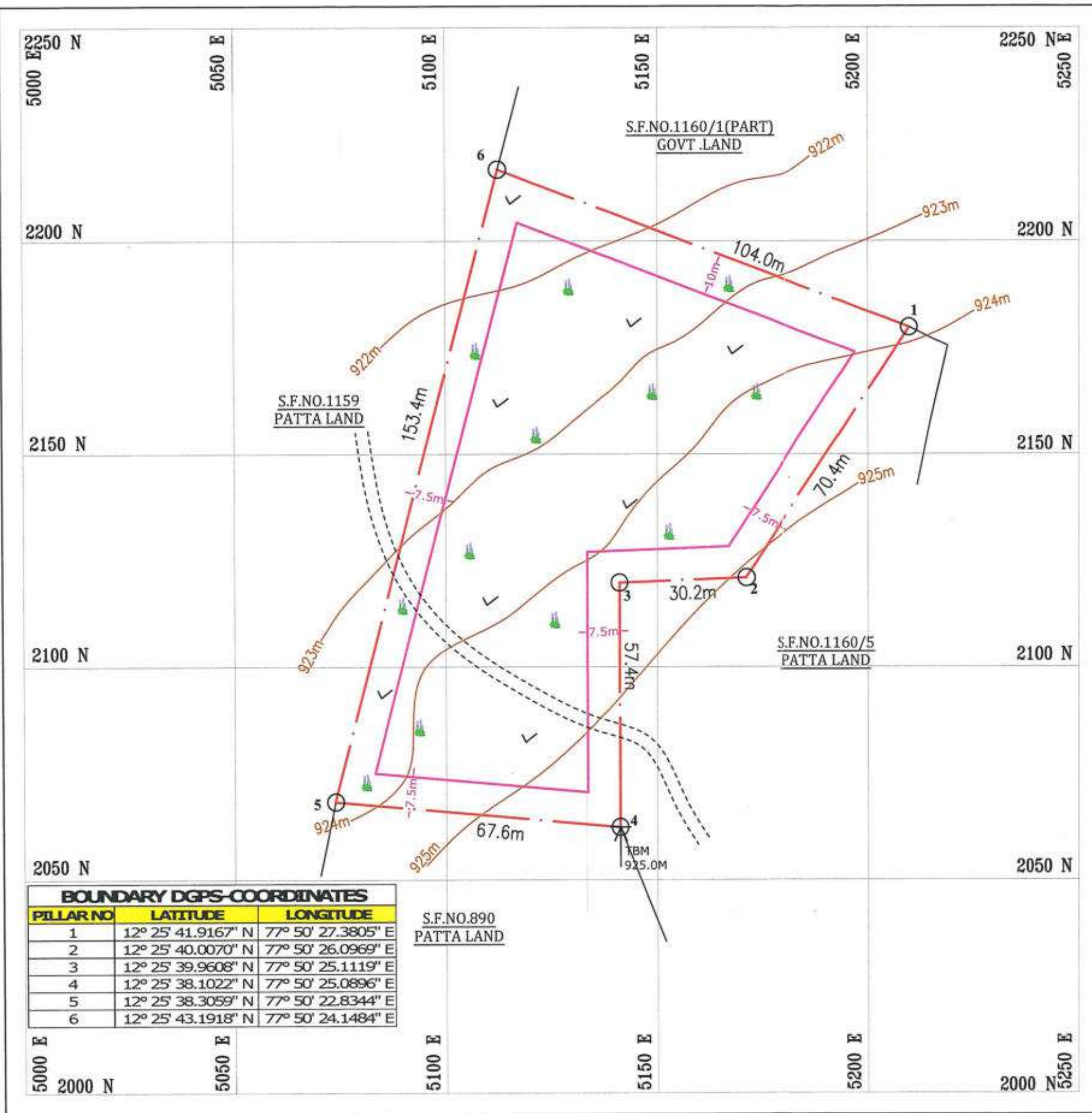
**SURFACE PLAN**

SCALE 1:1000

**Prepared By:**

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

S.DHANASEKAR,M.Sc.,  
QUALIFIED PERSON



| BOUNDARY DGPS-COORDINATES |                    |                    |
|---------------------------|--------------------|--------------------|
| PILLAR NO                 | LATITUDE           | LONGITUDE          |
| 1                         | 12° 25' 41.9167" N | 77° 50' 27.3805" E |
| 2                         | 12° 25' 40.0070" N | 77° 50' 26.0969" E |
| 3                         | 12° 25' 39.9608" N | 77° 50' 25.1119" E |
| 4                         | 12° 25' 38.1022" N | 77° 50' 25.0896" E |
| 5                         | 12° 25' 38.3059" N | 77° 50' 22.8344" E |
| 6                         | 12° 25' 43.1918" N | 77° 50' 24.1484" E |





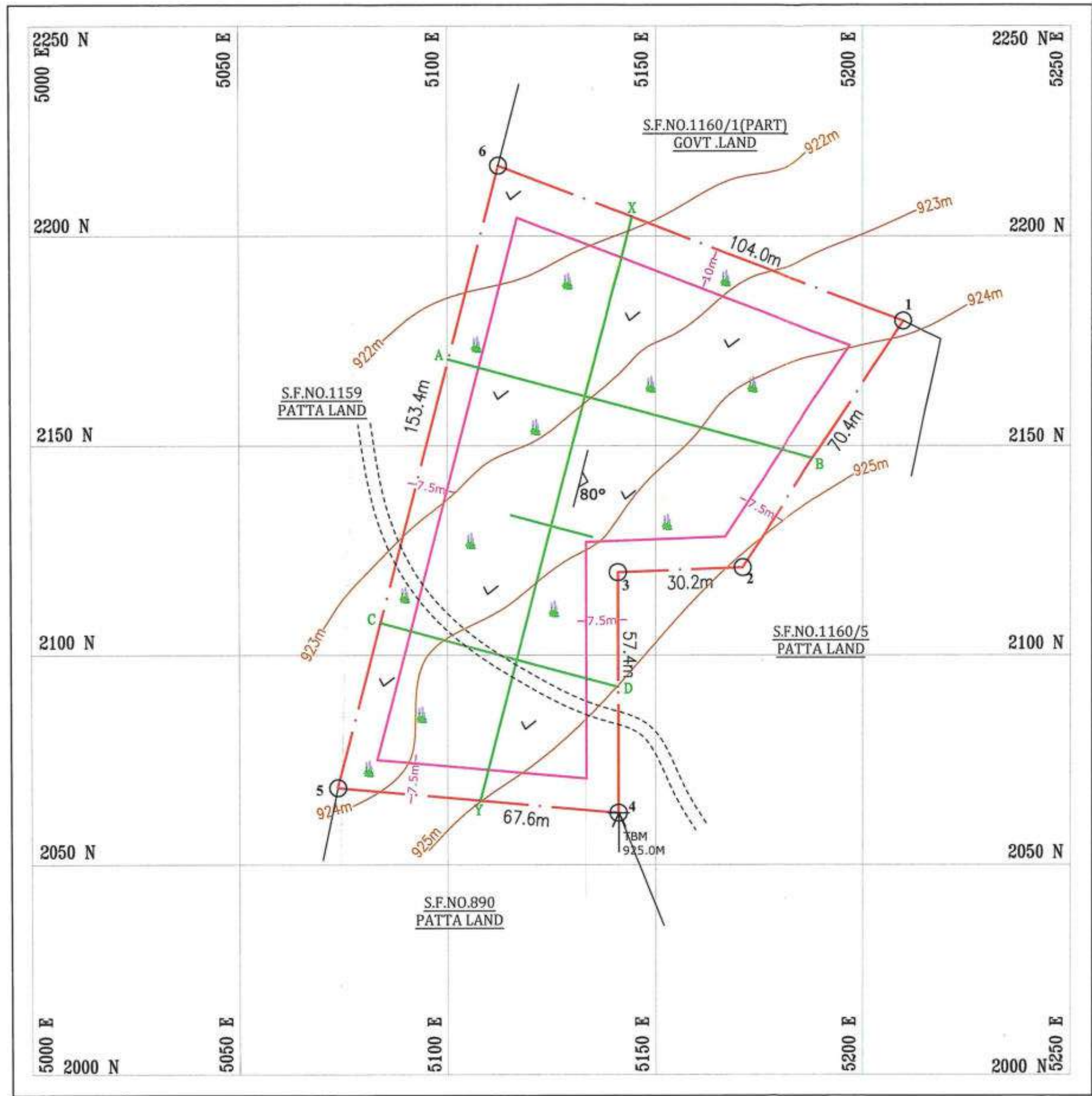
**PLATE NO.IV**  
 DATE OF SURVEY:01-03-2021  
**APPLICANT ADDRESS:**  
 M/S.JAYRAN MINES,  
 DOOR NO. HIG-301,  
 NEW TEMPLE LAND HUDCO,  
 RAJAJI ROAD, HOSUR TALUK,  
 KRISHNAGIRI DISTRICT - 635 109.

**LOCATION OF QUARRY:**  
 EXTENT : 1.09.0 Hects  
 S.F.NO : 1160/1(Part)  
 VILLAGE : IRUDHUKOTTAI  
 TALUK : DENKANIKOTTAI  
 DISTRICT : KRISHNAGIRI

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| QUARRY LEASE BOUNDARY       |  |
| 7.5m & 10m BOUNDARY BARRIER |  |
| TEMPORARY BENCH MARK        |  |
| TOP SOIL                    |  |
| COLOUR GRANITE              |  |
| CONTOUR LINE                |  |
| QUARRY ROAD                 |  |
| SHRUB                       |  |
| STRIKE AND DIP              |  |

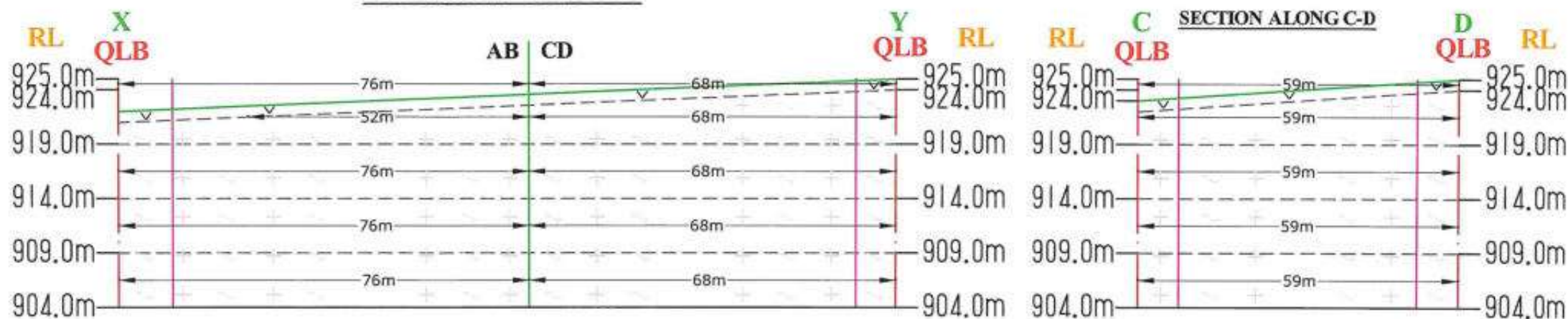
**GEOLOGICAL PLAN**  
 SCALE 1:1000

**Prepared By:**  
 I DO HEREBY CERTIFY THAT THE PLATE  
 HAS BEEN CHECKED BY ME AND IS CORRECT  
 TO THE BEST OF MY KNOWLEDGE  
  
 S.DHANASEKAR,M.Sc.,  
 QUALIFIED PERSON





SECTION ALONG X-Y



TOTAL DEPTH - 21M



PLATE NO.IV-A

DATE OF SURVEY:01-03-2021

APPLICANT ADDRESS:

M/S.JAYRAN MINES,  
DOOR NO. HIG-301,  
NEW TEMPLE LAND HUDCO,  
RAJAJI ROAD, HOSUR TALUK,  
KRISHNAGIRI DISTRICT - 635 109.

LOCATION OF QUARRY:

EXTENT : 1.09.0 Hects  
S.F.NO : 1160/1(Part)  
VILLAGE : IRUDHUKOTTAI  
TALUK : DENKANIKOTTAI  
DISTRICT : KRISHNAGIRI

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- QUARRY LEASE BOUNDARY
- 7.5m & 10m BOUNDARY BARRIER
- TOP SOIL
- COLOUR GRANITE

GEOLOGICAL SECTIONS

SECTION: HOR-1:1000  
VER-1:500

Prepared By:

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TO THE BEST OF MY KNOWLEDGE

S.DHANASEKAR,M.Sc.,  
QUALIFIED PERSON

| GRANITE GEOLOGICAL RESERVES |       |               |              |              |              |                          |                         |                         |                |                   |
|-----------------------------|-------|---------------|--------------|--------------|--------------|--------------------------|-------------------------|-------------------------|----------------|-------------------|
| Section                     | Bench | length in (m) | Width in (m) | Depth in (m) | Volume In m3 | Total Reserves ROM in m3 | Color Granite 30% in m3 | Granite Waste 70% in m3 | Top Soil in m3 | Total Waste in m3 |
| XY-AB                       | I     | 76            | 91           | 1            | 6916         |                          |                         |                         | 6916           | 6916              |
|                             | II    | 52            | 76           | 5            | 19760        | 19760                    | 5928                    | 13832                   |                | 13832             |
|                             | III   | 76            | 91           | 5            | 34580        | 34580                    | 10374                   | 24206                   |                | 24206             |
|                             | IV    | 76            | 91           | 5            | 34580        | 34580                    | 10374                   | 24206                   |                | 24206             |
|                             | V     | 76            | 91           | 5            | 34580        | 34580                    | 10374                   | 24206                   |                | 24206             |
| TOTAL                       |       |               |              |              |              | 123500                   | 37050                   | 86450                   | 6916           | 93366             |
| XY-CD                       | I     | 68            | 59           | 1            | 4012         |                          |                         |                         | 4012           | 4012              |
|                             | II    | 68            | 59           | 5            | 20060        | 20060                    | 6018                    | 14042                   |                | 14042             |
|                             | III   | 68            | 59           | 5            | 20060        | 20060                    | 6018                    | 14042                   |                | 14042             |
|                             | IV    | 68            | 59           | 5            | 20060        | 20060                    | 6018                    | 14042                   |                | 14042             |
|                             | V     | 68            | 59           | 5            | 20060        | 20060                    | 6018                    | 14042                   |                | 14042             |
| TOTAL                       |       |               |              |              |              | 80240                    | 24072                   | 56168                   | 4012           | 60180             |
| GRAND TOTAL                 |       |               |              |              |              | 203740                   | 61122                   | 142618                  | 10928          | 153546            |



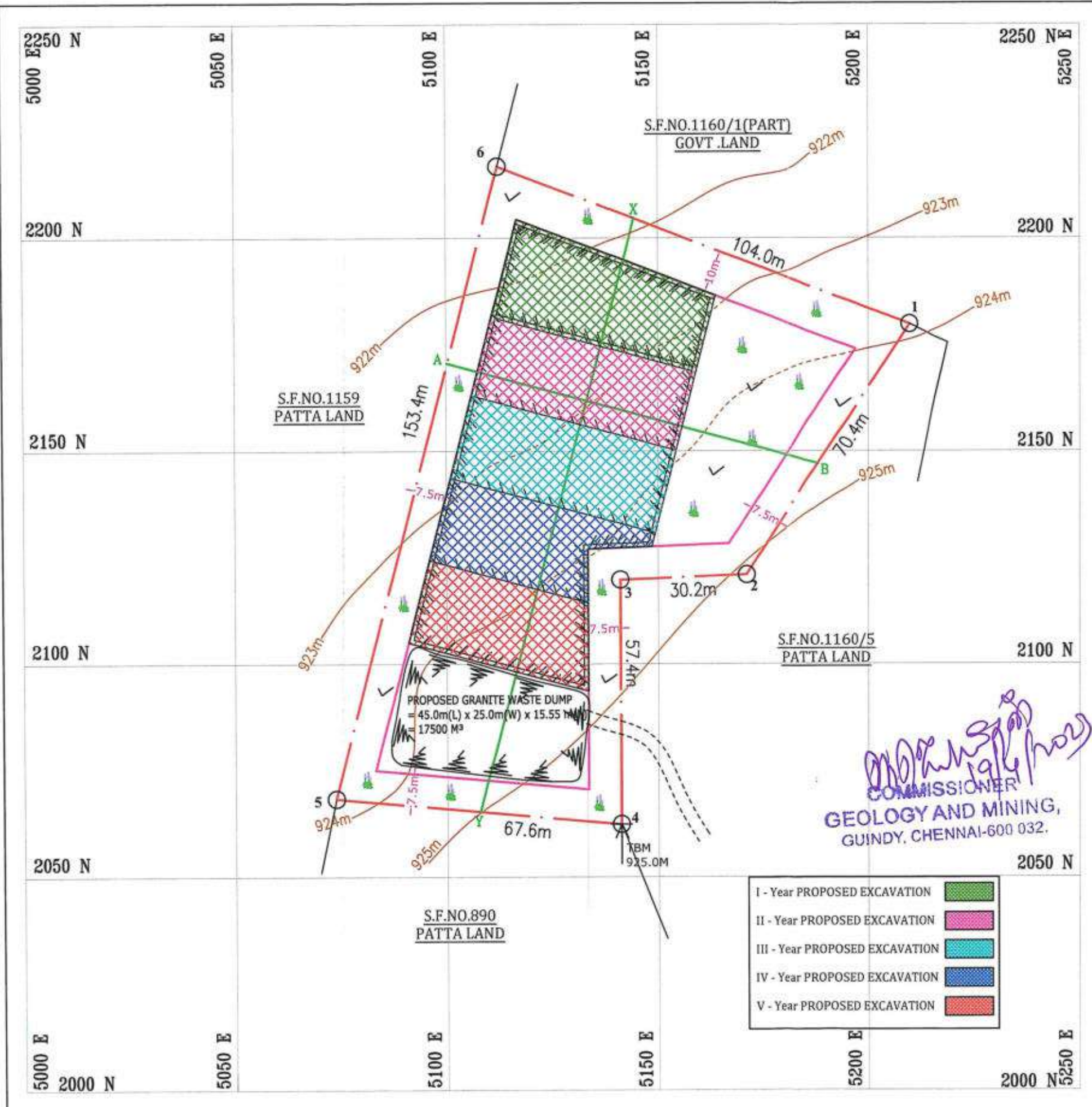


PLATE NO.V

DATE OF SURVEY:01-03-2021

APPLICANT ADDRESS:  
M/S.JAYRAN MINES,  
DOOR NO. HIG-301,  
NEW TEMPLE LAND HUDCO,  
RAJAJI ROAD, HOSUR TALUK,  
KRISHNAGIRI DISTRICT - 635 109.

LOCATION OF QUARRY:  
EXTENT : 1.09.0 Hects  
S.F.NO : 1160/1(Part)  
VILLAGE : IRUDHUKOTTAI  
TALUK : DENKANIKOTTAI  
DISTRICT : KRISHNAGIRI

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QUARRY LEASE BOUNDARY

7.5m & 10m BOUNDARY BARRIER

TEMPORARY BENCH MARK

TOP SOIL

COLOUR GRANITE

CONTOUR LINE

QUARRY ROAD

SHRUB

PROPOSED DUMP

T.B.M

925.0m

V

V

925m

925m

YEARWISE DEVELOPMENT AND PRODUCTION PLAN

SCALE 1:1000

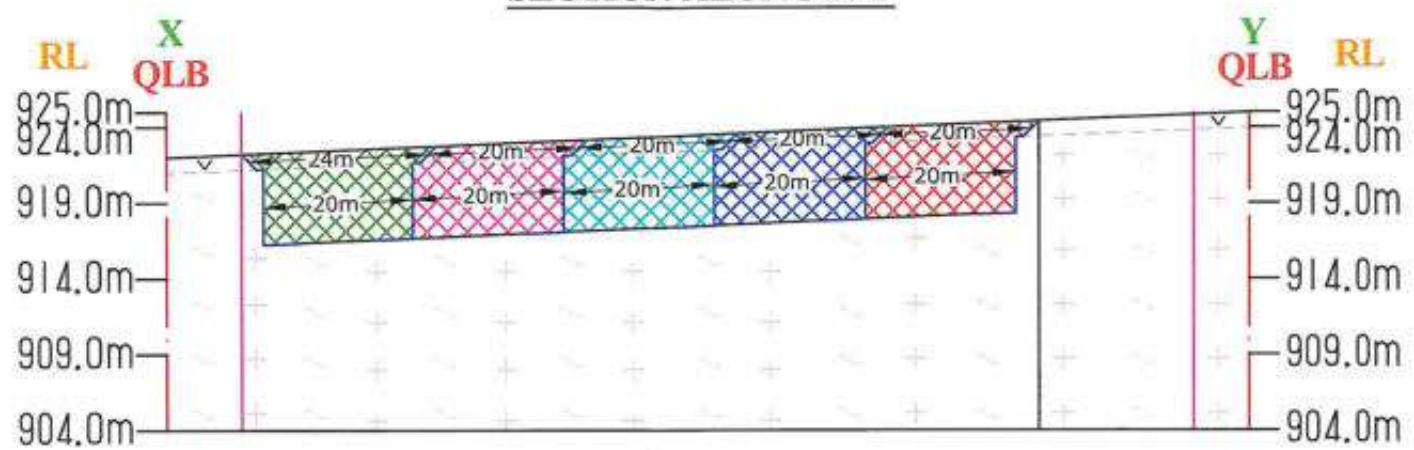
Prepared By:

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S.DHANASEKAR.M.Sc.,  
QUALIFIED PERSON



SECTION ALONG X-Y



TOTAL DEPTH -6M



PLATE NO.V-A

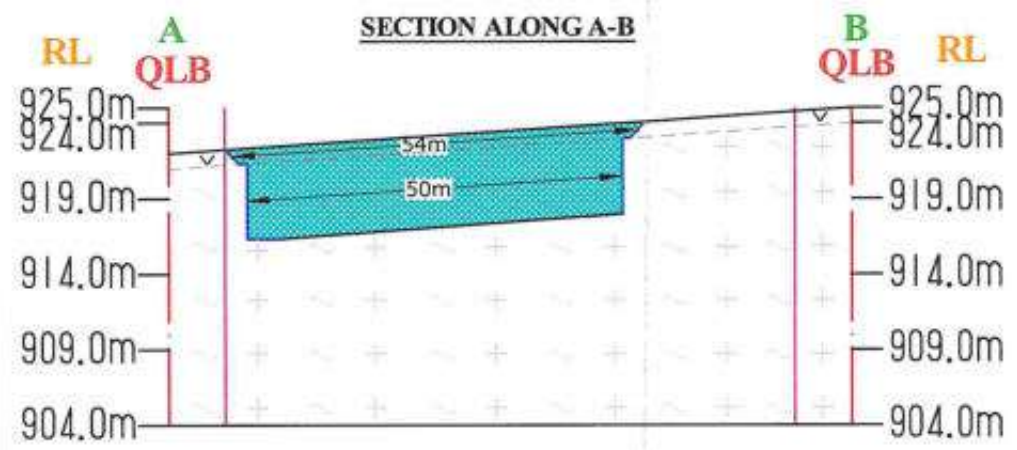
DATE OF SURVEY:01-03-2021

APPLICANT ADDRESS:

M/S.JAYRAN MINES,  
DOOR NO. HIG-301,  
NEW TEMPLE LAND HUDCO,  
RAJAJI ROAD, HOSUR TALUK,  
KRISHNAGIRI DISTRICT - 635 109.

LOCATION OF QUARRY:

EXTENT : 1.09.0 Hects  
S.F.NO : 1160/1(Part)  
VILLAGE : IRUDHUKOTTAI  
TALUK : DENKANIKOTTAI  
DISTRICT : KRISHNAGIRI



- I - Year PROPOSED EXCAVATION
- II - Year PROPOSED EXCAVATION
- III - Year PROPOSED EXCAVATION
- IV - Year PROPOSED EXCAVATION
- V - Year PROPOSED EXCAVATION

| YEARWISE DEVELOPMENT & PRODUCTION |       |               |              |              |              |                          |                         |                         |                |                   |
|-----------------------------------|-------|---------------|--------------|--------------|--------------|--------------------------|-------------------------|-------------------------|----------------|-------------------|
| Year                              | Bench | length in (m) | Width in (m) | Depth in (m) | Volume In m3 | Total Reserves ROM in m3 | Color Granite 30% in m3 | Granite Waste 70% in m3 | Top Soil in m3 | Total Waste in m3 |
| I YEAR                            | I     | 24            | 54           | 1            | 1296         | 5000                     | 1500                    | 3500                    | 1296           | 1296              |
|                                   | II    | 20            | 50           | 5            | 5000         |                          |                         |                         |                | 3500              |
| TOTAL                             |       |               |              |              |              | 5000                     | 1500                    | 3500                    | 1296           | 4796              |
| II YEAR                           | I     | 20            | 54           | 1            | 1080         | 5000                     | 1500                    | 3500                    | 1080           | 1080              |
|                                   | II    | 20            | 50           | 5            | 5000         |                          |                         |                         |                | 3500              |
| TOTAL                             |       |               |              |              |              | 5000                     | 1500                    | 3500                    | 1080           | 4580              |
| III YEAR                          | I     | 20            | 54           | 1            | 1080         | 5000                     | 1500                    | 3500                    | 1080           | 1080              |
|                                   | II    | 20            | 50           | 5            | 5000         |                          |                         |                         |                | 3500              |
| TOTAL                             |       |               |              |              |              | 5000                     | 1500                    | 3500                    | 1080           | 4580              |
| IV YEAR                           | I     | 20            | 54           | 1            | 1080         | 5000                     | 1500                    | 3500                    | 1080           | 1080              |
|                                   | II    | 20            | 50           | 5            | 5000         |                          |                         |                         |                | 3500              |
| TOTAL                             |       |               |              |              |              | 5000                     | 1500                    | 3500                    | 1080           | 4580              |
| V YEAR                            | I     | 20            | 54           | 1            | 1080         | 5000                     | 1500                    | 3500                    | 1080           | 1080              |
|                                   | II    | 20            | 50           | 5            | 5000         |                          |                         |                         |                | 3500              |
| TOTAL                             |       |               |              |              |              | 5000                     | 1500                    | 3500                    | 1080           | 4580              |
| GRAND TOTAL                       |       |               |              |              |              | 25000                    | 7500                    | 17500                   | 5616           | 23116             |

INDEX

- QUARRY LEASE BOUNDARY
- 7.5m & 10m BOUNDARY BARRIER
- TOP SOIL
- COLOUR GRANITE

YEARWISE DEVELOPMENT AND PRODUCTION SECTIONS

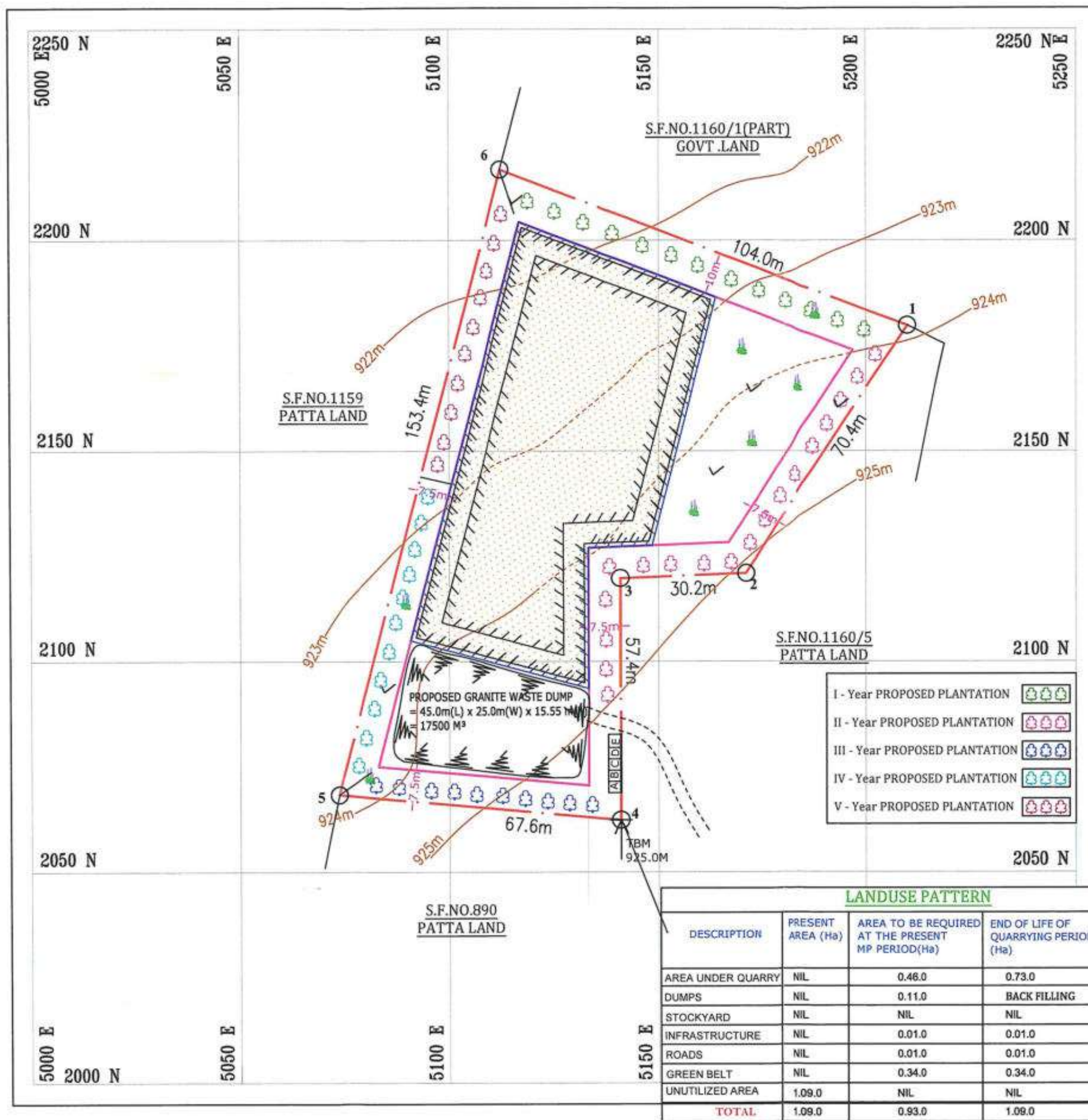
SECTION: HOR-1:1000  
VER-1:500

Prepared By:

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

S.DHANASEKAR,M.Sc.,  
QUALIFIED PERSON





**PLATE NO.VI**  
 DATE OF SURVEY:01-03-2021

**APPLICANT ADDRESS:**  
 M/S.JAYRAN MINES,  
 DOOR NO. HIG-301,  
 NEW TEMPLE LAND HUDCO,  
 RAJAJI ROAD, HOSUR TALUK,  
 KRISHNAGIRI DISTRICT - 635 109.

**LOCATION OF QUARRY:**  
 EXTENT : 1.09.0 Hects  
 S.F.NO : 1160/1(Part)  
 VILLAGE : IRUDHUKOTTAI  
 TALUK : DENKANIKOTTAI  
 DISTRICT : KRISHNAGIRI



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| QUARRY LEASE BOUNDARY       |  |
| 7.5m & 10m BOUNDARY BARRIER |  |
| TEMPORARY BENCH MARK        |  |
| TOP SOIL                    |  |
| COLOUR GRANITE              |  |
| CONTOUR LINE                |  |
| QUARRY ROAD                 |  |
| PROPOSED DUMP               |  |
| MINE LAYOUT                 |  |
| SHRUB                       |  |

**MINELAYOUT AND LANDUSE PATTERN & AFFORESTATION PLAN**

SCALE 1:1000

**Prepared By:**

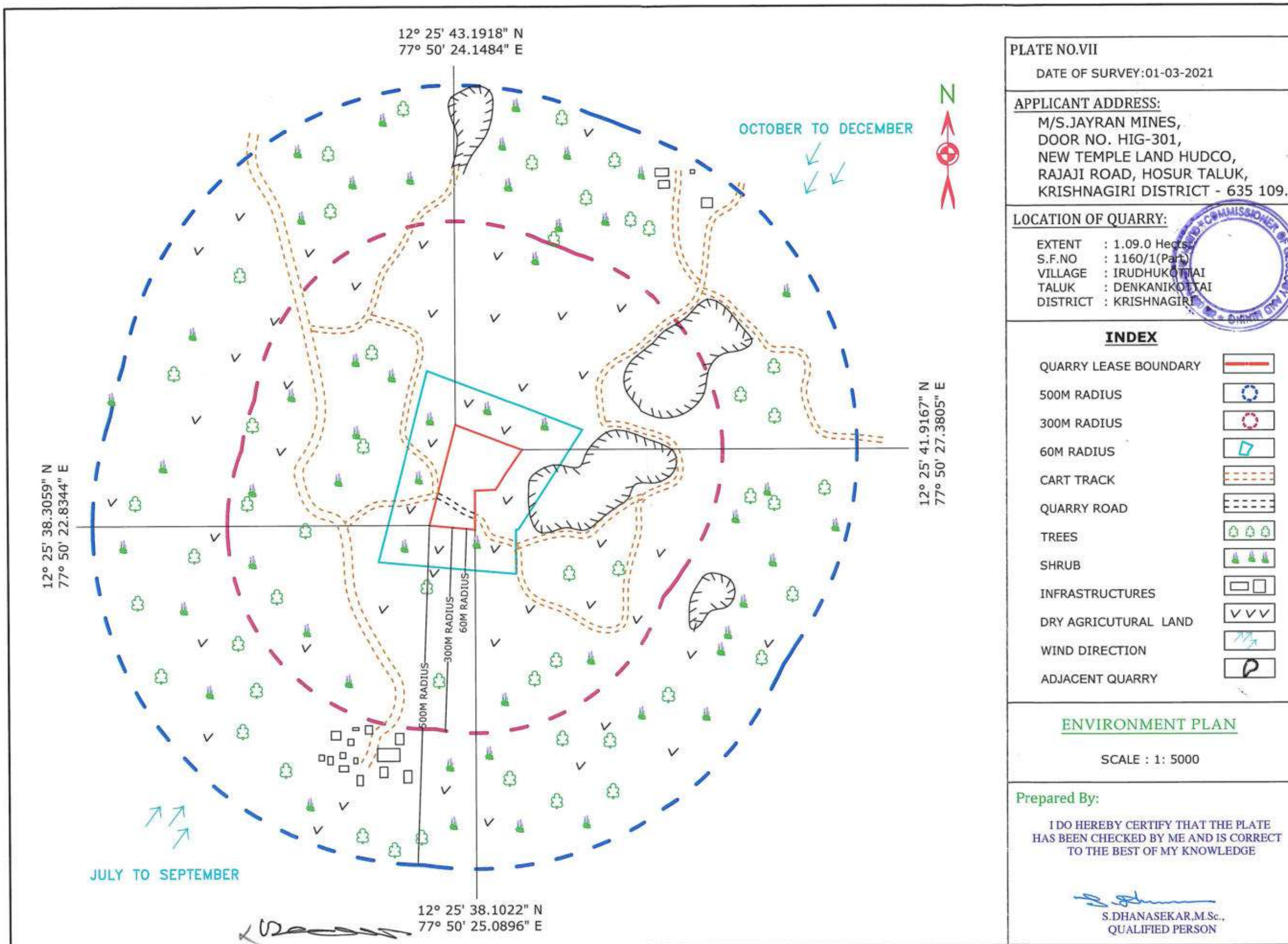
I DO HEREBY CERTIFY THAT THE PLATE HAS BEEN CHECKED BY ME AND IS CORRECT TO THE BEST OF MY KNOWLEDGE

S.DHANASEKAR,M.Sc.,  
 QUALIFIED PERSON

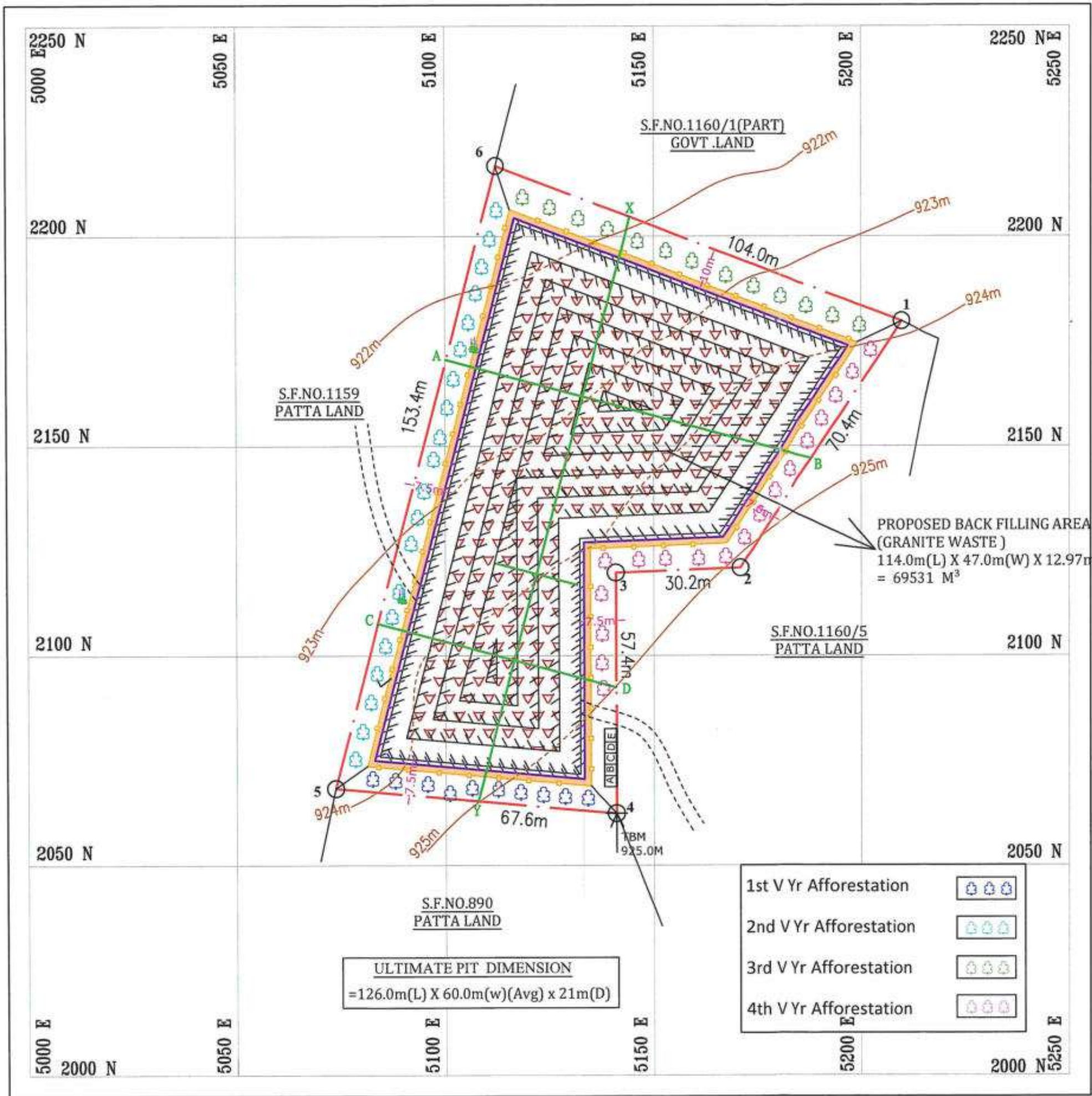
**LANDUSE PATTERN**

| DESCRIPTION       | PRESENT AREA (Ha) | AREA TO BE REQUIRED AT THE PRESENT MP PERIOD(Ha) | END OF LIFE OF QUARRYING PERIOD (Ha) | Color code |
|-------------------|-------------------|--------------------------------------------------|--------------------------------------|------------|
| AREA UNDER QUARRY | NIL               | 0.46.0                                           | 0.73.0                               |            |
| DUMPS             | NIL               | 0.11.0                                           | BACK FILLING                         |            |
| STOCKYARD         | NIL               | NIL                                              | NIL                                  |            |
| INFRASTRUCTURE    | NIL               | 0.01.0                                           | 0.01.0                               |            |
| ROADS             | NIL               | 0.01.0                                           | 0.01.0                               |            |
| GREEN BELT        | NIL               | 0.34.0                                           | 0.34.0                               |            |
| UNUTILIZED AREA   | 1.09.0            | NIL                                              | NIL                                  |            |
| <b>TOTAL</b>      | <b>1.09.0</b>     | <b>0.93.0</b>                                    | <b>1.09.0</b>                        |            |









**PLATE NO.VIII**  
 DATE OF SURVEY:01-03-2021

**APPLICANT ADDRESS:**  
 M/S.JAYRAN MINES,  
 DOOR NO. HIG-301,  
 NEW TEMPLE LAND HUDCO,  
 RAJAJI ROAD, HOSUR TALUK,  
 KRISHNAGIRI DISTRICT - 635 109

**LOCATION OF QUARRY:**  
 EXTENT : 1.09.0 Hects  
 S.F.NO : 1160/1(Part)  
 VILLAGE : IRUDHUKOTTAI  
 TALUK : DENKANIKOTTAI  
 DISTRICT : KRISHNAGIRI

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| 7.5m & 10m BOUNDARY BARRIER |  |
| TEMPORARY BENCH MARK        |  |
| TOP SOIL                    |  |
| COLOUR GRANITE              |  |
| CONTOUR LINE                |  |
| QUARRY ROAD                 |  |
| FENCING                     |  |
| PARAPET WALL                |  |
| ULTIMATE PIT LIMIT          |  |
| PROPOSED BACKFILLING AREA   |  |

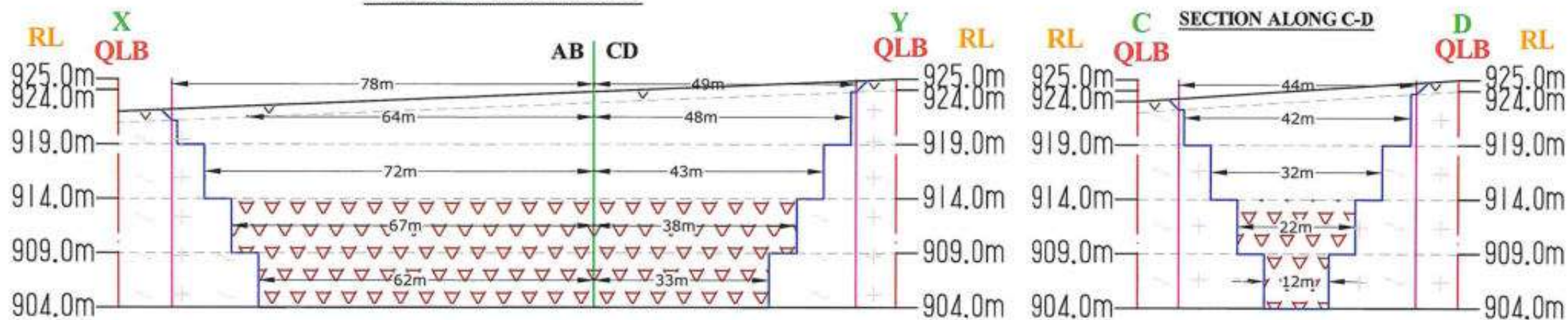
**CONCEPTUAL/ FINAL MINE CLOSURE PLAN**  
 SCALE 1:1000

**Prepared By:**  
 I DO HEREBY CERTIFY THAT THE PLATE  
 HAS BEEN CHECKED BY ME AND IS CORRECT  
 TO THE BEST OF MY KNOWLEDGE  
  
  
 S.DHANASEKAR,M.Sc.,  
 QUALIFIED PERSON

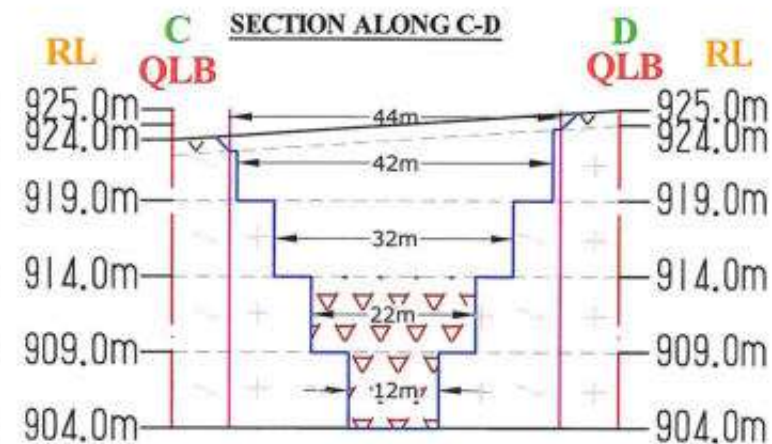




## SECTION ALONG X-Y



## SECTION ALONG C-D



TOTAL DEPTH - 21M

PLATE NO.VIII-A

DATE OF SURVEY:01-03-2021

APPLICANT ADDRESS:

M/S.JAYRAN MINES,  
DOOR NO. HIG-301,  
NEW TEMPLE LAND HUDCO,  
RAJAJI ROAD, HOSUR TALUK,  
KRISHNAGIRI DISTRICT - 635 109.

LOCATION OF QUARRY:

EXTENT : 1.09.0 Hects  
S.F.NO : 1160/1(Part)  
VILLAGE : IRUDHUKOTTAI  
TALUK : DENKANIKOTTAI  
DISTRICT : KRISHNAGIRI

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| TOP SOIL                    |  |
| COLOUR GRANITE              |  |
| ULTIMATE PIT SLOPE          |  |
| PROPOSED BACKFILLING AREA   |  |

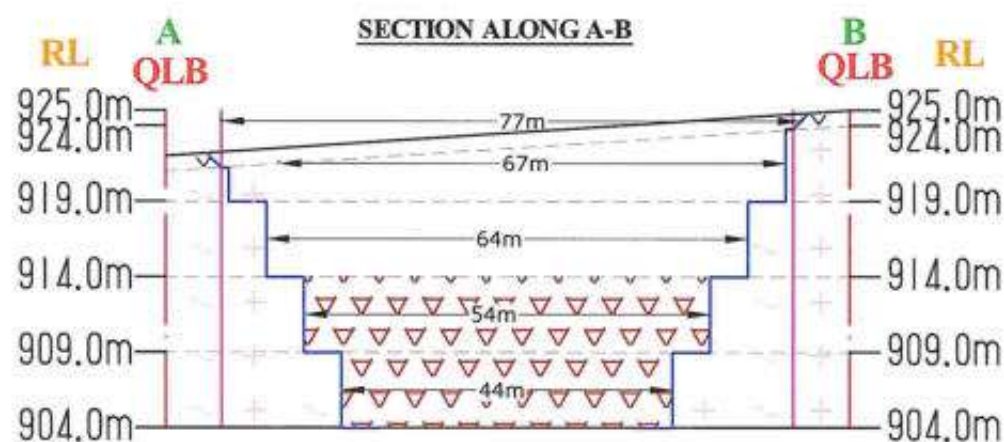
## CONCEPTUAL/ FINAL MINE CLOSURE SECTIONS

SECTION: HOR-1:1000  
VER-1:500

Prepared By:

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

S.DHANASEKAR,M.Sc.,  
QUALIFIED PERSON



## ULTIMATE PIT DIMENSION

=126.0m(L) X 60.0m(w)(Avg) x 21m(D)

## MINEABLE RESERVES

| Section     | Bench | length in (m) | Width in (m) | Depth in (m) | Volume In m3 | Total Reserves ROM in m3 | Color Granite 30% in m3 | Granite Waste 70% in m3 | Top Soil in m3 | Total Waste in m3 |
|-------------|-------|---------------|--------------|--------------|--------------|--------------------------|-------------------------|-------------------------|----------------|-------------------|
| XY-AB       | I     | 78            | 77           | 1            | 6006         |                          |                         |                         | 6006           | 6006              |
|             | II    | 64            | 67           | 5            | 21440        | 21440                    | 6432                    | 15008                   |                | 15008             |
|             | III   | 72            | 64           | 5            | 23040        | 23040                    | 6912                    | 16128                   |                | 16128             |
|             | IV    | 67            | 54           | 5            | 18090        | 18090                    | 5427                    | 12663                   |                | 12663             |
|             | V     | 62            | 44           | 5            | 13640        | 13640                    | 4092                    | 9548                    |                | 9548              |
| TOTAL       |       |               |              |              |              | 76210                    | 22863                   | 53347                   | 6006           | 59353             |
| XY-CD       | I     | 49            | 44           | 1            | 2156         |                          |                         |                         | 2156           | 2156              |
|             | II    | 48            | 42           | 5            | 10080        | 10080                    | 3024                    | 7056                    |                | 7056              |
|             | III   | 43            | 32           | 5            | 6880         | 6880                     | 2064                    | 4816                    |                | 4816              |
|             | IV    | 38            | 22           | 5            | 4180         | 4180                     | 1254                    | 2926                    |                | 2926              |
|             | V     | 33            | 12           | 5            | 1980         | 1980                     | 594                     | 1386                    |                | 1386              |
| TOTAL       |       |               |              |              |              | 23120                    | 6936                    | 16184                   | 2156           | 18340             |
| GRAND TOTAL |       |               |              |              |              | 99330                    | 29799                   | 69531                   | 8162           | 77693             |



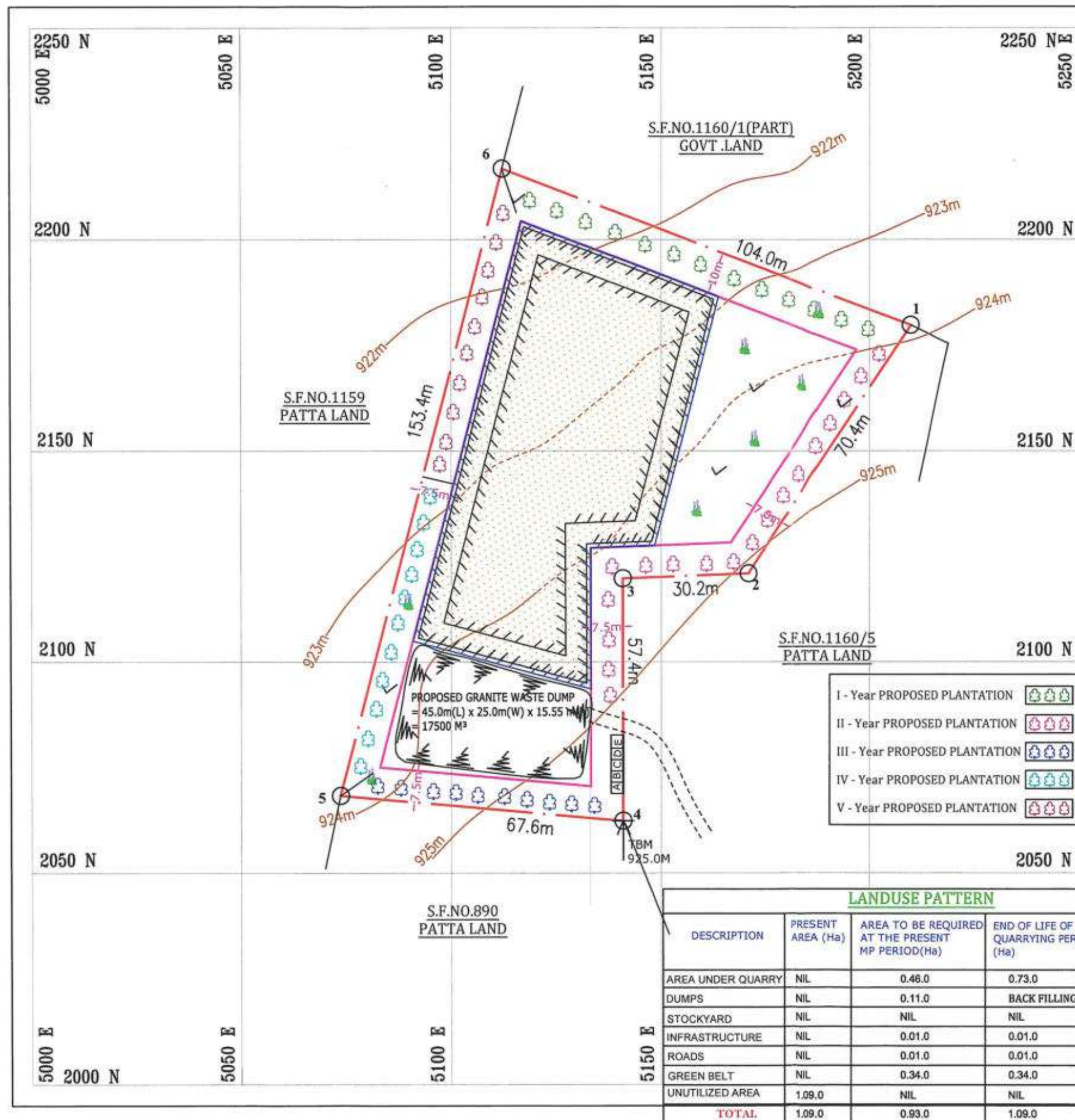


PLATE NO.IX

DATE OF SURVEY:01-03-2021

**APPLICANT ADDRESS:**

M/S.JAYRAN MINES,  
DOOR NO. HIG-301,  
NEW TEMPLE LAND HUDCO,  
RAJAJI ROAD, HOSUR TALUK,  
KRISHNAGIRI DISTRICT - 635 109.

**LOCATION OF QUARRY:**

EXTENT : 1.09.0 Hects  
S.F.NO : 1160/1(Part)  
VILLAGE : IRUDHUKOTTAI  
TALUK : DENKANIKOTTAI  
DISTRICT : KRISHNAGIRI

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| QUARRY LEASE BOUNDARY       |  |
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| COLOUR GRANITE              |  |
| CONTOUR LINE                |  |
| QUARRY ROAD                 |  |
| PROPOSED DUMP               |  |
| MINE LAYOUT                 |  |
| SHRUB                       |  |

**PROGRESSIVE MINE CLOSURE PLAN**

SCALE 1:1000

**Prepared By:**

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

S.DHANASEKAR, M.Sc.,  
QUALIFIED PERSON



06/2/2025

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## ANNEXURE - III

வனம் கமிஷனர்

வனம் பெறுவோம்

## தமிழ்நாடு வனத்துறை

அனுப்பதல்

திரு. தீபக் எஸ். பீல்கி, இலய,  
வன உயிரின காப்பாளர்,  
மத்திகிரி, ஓரூர் - 635 110.  
தொலைபேசி எண். 04344-262259.

பெறுதல்

மாவட்ட ஆட்சித் தலைவர்,  
கிருஷ்ணகிரி மாவட்டம்,  
கிருஷ்ணகிரி.

ந.க.எண்.5279/2019-எல் நாள். 27.11.2019

(ஸ்ரீ லிங்கா லுடம், கார்த்திகை 11, திருவள்ளூர் ஆண்டு 2050)

அப்பா,

**பொருள் :** கனிமங்களும் குவாரிகளும் - சிறுகனிமம் - கிரானைட் கற்கள் - கிருஷ்ணகிரி மாவட்டத்தில் அரசு புறம்போக்கு நிலங்களில் உள்ள கிரானைட் கற்கள் வெட்டியெடுக்க டெண்டருடன் இணைந்த ஏலமுறையில் குவாரி குத்தகை வழங்குதல் குறித்து வனத்துறையின் தடைமின்மைச் சான்று கோருதல் - வனத்துறை நோக்கிலான கருத்து தெரிவித்தல்-தொடர்பாக.

**பார்வை :** 1. மாவட்ட ஆட்சித் தலைவர், கிருஷ்ணகிரி மாவட்டம் ந.க.எண். 90/2017/கனிமம் நாள்.20.05.2019.  
2. வனச்சரக அலுவலர், தேன்கனிக்கோட்டை சரகம் ந.க.எண்.178/2019 நாள்.13.11.2019.  
3. வனச்சரக அலுவலர், கிருஷ்ணகிரி சரகம் ந.க.எண்.560/2019 நாள்.25.11.2019.

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பார்வை 1-ல் கண்ட கிருஷ்ணகிரி மாவட்ட ஆட்சித் தலைவர் அவர்களது கடிதத்தில், கிருஷ்ணகிரி மாவட்டத்தில் உள்ள அரசு புறம்போக்கு நிலங்களில் கிரானைட் கற்கள் வெட்டி எடுக்க டெண்டர் / பொது ஏலம் மூலம் குத்தகைக்கு வழங்க, வனத்துறை நோக்கிலான கருத்து மற்றும் வனத்துறையின் தடைமின்மை சான்று வழங்க வேண்டி கேட்கப்பட்டுள்ளது.

மேற்படி மனு மீது நடவடிக்கை எடுக்கும் பொருட்டு, கிருஷ்ணகிரி வனச்சரக அலுவலரால் 25.11.2019ந்தேதியும் மற்றும் தேன்கனிக்கோட்டை வனச்சரக அலுவலரால் 13.11.2019ந்தேதியும் சரக பணியாளர்களுடன் தணிக்கை மேற்கொண்டு அறிக்கை சமர்ப்பித்துள்ளனர்.

கிருஷ்ணகிரி மற்றும் தேன்கனிக்கோட்டை வனச்சரக அலுவலர்கள் அறிக்கைகளின் அடிப்படையில், கிரானைட் கற்கள் வெட்டி எடுக்க டெண்டர் / பொது ஏலம் மூலம் குத்தகைக்கு வழங்க அனுமதி கோரியுள்ள பகுதிகளை வன உயிரின காப்பாளரால், சரக பணியாளர்களுடன் தணிக்கை செய்யப்பட்டதில், கீழ்க்கண்ட அட்டவணை 1-ல் உள்ள குவாரிப் பகுதிகளுக்கு கிரானைட் கற்கள் வெட்டி எடுக்க டெண்டர் / பொது ஏலத்தில் குத்தகைக்குவிட கீழ்க்கண்டவாறு இவ்வனுபலகத்தின் கருத்து தெரிவிக்கப்படுகிறது.



i) கிராண்ட் கற்குவாரி குத்தகை வழங்க ஒப்பந்தம் செய்வதற்கு (Lease deed agreement) முன்பு ஒவ்வொரு குவாரிப் பகுதிக்கும் தனித்தனியாக வளத்துறையின் நிபந்தனை மற்றும் குறிப்புகளுடன் முன் அனுமதி பெற்றப்பின் குவாரிப் பணி செய்ய பணி ஆணை (Work order) வழங்கப்பட வேண்டும்.

ii) காவேரி வடக்கு வன உயிரின சரணாலயத்திற்கான Eco Sensitive Zone எல்லை நிர்ணயம் செய்ய பிரேரேபிக்கப்பட்டு ஆணை எதிர்நோக்கியுள்ள சூழலில், மேற்படி கிராண்ட் கற்குவாரி குத்தகை கோரும் புலங்கள் காவேரி வடக்கு வன உயிரின சரணாலய எல்லையிலிருந்து 10 கி.மீ-க்குள் அமைந்திருப்பின் தேசிய வன உயிரின வாரியத்தின் முன் அனுமதி (National Board for Wildlife) பெறப்பட வேண்டும்.

iii) மலைதள பாதுகாப்பு பரிந்துரை குழு (Hill Area Conservation Authority)-ன்படி அறிவிக்கை செய்யப்பட்ட கிராம எல்லைக்குள் கற்குவாரி பணி செய்ய அனுமதி கோரியுள்ள புலங்கள் அமைந்திருப்பின், மலைதள பாதுகாப்பு பரிந்துரை குழு (Hill Area Conservation Authority)-ன் கீழ் முன் அனுமதி பெறப்படவேண்டும்.

iv) கிராண்ட் கற்கள் வெட்டி எடுக்க டெண்டர் / பொது ஏலத்தில் குத்தகைக்குவிட அனுமதி கோரும் புலங்கள் வருவாய்த்துறை ஆவணங்களில் "காடு" என வகைப்படுத்தப்பட்ட புலங்களில் கற்குவாரிப் பணிசெய்யஅனுமதிக்கக் கூடாது.

v) கிராண்ட் கற்கள் வெட்டி எடுக்க டெண்டர் / பொது ஏலத்தில் குத்தகைக்குவிட அனுமதி கோரும் புலங்கள் தமிழ்நாடு வனச்சட்டம் 1882-ன் பிரிவு 4 மற்றும் 16-ன் கீழ்காப்பு நிலம் / காப்புக்காடு என அறிவிக்கை செய்யப்பட்ட புலங்களாக இருத்தல் கூடாது.

vi) கிராண்ட் கற்கள் வெட்டி எடுக்க டெண்டர் / பொது ஏலத்தில் குத்தகைக்குவிட அனுமதி கோரும் புலங்கள் தமிழ்நாடு வனச்சட்டம் 1882-ன் பிரிவு 26-ன் கீழ் அறிவிக்கை செய்யப்பட்ட புலங்களாக இருத்தல்கூடாது.

vii) கிராண்ட் கற்கள் வெட்டி எடுக்க டெண்டர் / பொது ஏலத்தில் குத்தகைக்குவிட அனுமதி கோரும் புலங்கள் காப்புக்காட்டின் எல்லைக்கு அருகில் அமைந்திருப்பின், Standing Orders of the Board of Revenue- volume - I Section III, Sub-Section 38 (III) வருவாய் வாரிய நிலை ஆணை தொகுப்பு 1, பிரிவு 3, உட்பிரிவு 38 (III)-ன்படி காப்புக்காட்டிற்கு அருகில் உள்ள நிலத்தில் இதர பயன்பாட்டிற்கு உட்படுத்த நடவடிக்கை மேற்கொள்ளப்படும் போது காப்புக் காட்டின் எல்லையிலிருந்து குறைந்தபட்சம் 60 மீட்டர் (3 Chain) தொலைவிற்கு அப்பாற்பட்டிருக்க வேண்டும் என்ற நிபந்தனையை கடைபிடிக்கப்பட வேண்டும்.

viii) அரசாணை (நிலை) எண்.79 தொழில் (கனிமம் 1) துறை நாள்.06.04.2015-ல் குறிப்பிட்டுள்ள நிபந்தனைகளை மாவட்ட நிர்வாகம் / கனிம வளத்துறை கவனத்தில் கொள்ளவேண்டும்.



## அட்டவணை - 1

கிராமணர் கற்கள் வெட்டி எடுக்க டெண்டருடன் இணைந்த ஏலமுறை வழங்க பரிந்துரை செய்யப்படும் குவாரிப் பகுதிகள் விபரம்

| Sl. No. | Taluk         | Village            | Survey Number    | Propoed area (In Ha) |
|---------|---------------|--------------------|------------------|----------------------|
| 1       | BARGUR        | PASINAYANAPALLI    | 10(P) ✓          | 3.69.0 ✓             |
| 2       | BARGUR        | MODIKUPPAM         | 121(P) ✓         | 2.85.0 ✓             |
| 3       | BARGUR        | SHOOLAMALAI        | 333(P) ✓         | 2.00.0 ✓             |
| 4       | BARGUR        | IKONDAM-KOTHAPALLI | 337/1(P) Bit 2   | 2.54.0 ✓             |
| 5       | BARGUR        | PULIGUNDA          | 345(P) BIT-1     | 1.67.0 ✓             |
| 6       | BARGUR        | PULIGUNDA          | 345(P) BIT-2     | 1.78.0 ✓             |
| 7       | BARGUR        | JAGADEVIPALAYAM    | 366(P) ✓         | 1.87.0 ✓             |
| 8       | BARGUR        | PASINAYANAPALLI    | 73(P) ✓          | 4.25.0 ✓             |
| 9       | BARGUR        | GUTTUR             | 309(P) ✓         | 2.50.0 ✓             |
| 10      | BARGUR        | GUTTUR             | 362/1(P) BIT-1 ✓ | 1.02.0 ✓             |
| 11      | BARGUR        | GUTTUR             | 362/1(P) BIT-2 ✓ | 1.62.0 ✓             |
| 12      | BARGUR        | GUTTUR             | 397/1 & 404/1 ✓  | 2.80.0 ✓             |
| 13      | POCHAMPALLI   | NAGOJANAHALLI      | 609A(P) BIT-1 ✓  | 2.92.0 ✓             |
| 14      | POCHAMPALLI   | NAGOJANAHALLI      | 609A(P) BIT-2 ✓  | 4.10.0 ✓             |
| 15      | POCHAMPALLI   | NAGOJANAHALLI      | 609A(P) BIT-3 ✓  | 3.23.0 ✓             |
| 16      | POCHAMPALLI   | NAGOJANAHALLI      | 609A(P) BIT-4 ✓  | 1.80.0 ✓             |
| 17      | POCHAMPALLI   | NAGOJANAHALLI      | 609A(P) BIT-5 ✓  | 1.54.0 ✓             |
| 18      | DENKANIKOTTAI | IRUDHUKOTTAI       | 1160             | 3.06.0 ✓             |

கீழ்க்கண்ட அட்டவணை 2-ல் குறிப்பிடப்பட்டுள்ள பகுதிகளில் குவாரிப் பணி செய்ய டெண்டருடன் இணைந்த ஏலமுறையில் விடுவதை தற்போது நிறுத்திவைக்கலாம் என்பதை தெரிவித்துக்கொள்கிறேன்.

## அட்டவணை - 2

கீழ்க்கண்ட பகுதிகளில் கிராமணர் கற்கள் வெட்டி எடுக்க டெண்டருடன் இணைந்த ஏலமுறை விடுவதை தற்போது நிறுத்திவைக்கலாம்

| Sl. No. | Taluk       | Village            | Survey Number  | Propoed area (In Ha) |
|---------|-------------|--------------------|----------------|----------------------|
| 1       | BARGUR      | MODIKUPPAM         | 143/2(P)       | 1.60.0               |
| 2       | BARGUR      | IKONDAM-KOTHAPALLI | 337/1(P) Bit 1 | 2.96.0               |
| 3       | POCHAMPALLI | NAGOJANAHALLI      | 642(P)         | 1.00.0               |
| 4       | UTHANGARAI  | KUNNATHUR          | 220/1 & 220/2  | 1.89.0               |



## 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    |

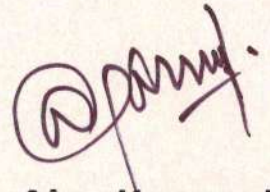
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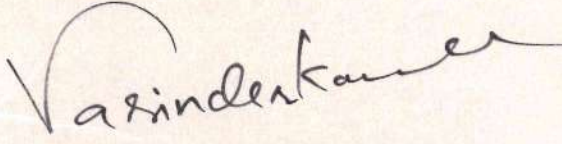
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