

# DRAFT ENVIRONMENTAL IMPACT ASSESSMENT & ENVIRONMENT MANAGEMENT PLAN

FOR OBTAINING

## Environmental Clearance under EIA Notification – 2006 Schedule Sl. No. 1 (a) (i): Mining Project

**“B1” CATEGORY – MINOR MINERAL – CLUSTER –PATTA LAND – FRESH QUARRY**

**THIRU. N.T. SAISADA ROUGH STONE AND GRAVEL QUARRY**


**Cluster Extent – 10.49.36 Ha**

**Project Proponent**

**Thiru. N.T. Saisada**

S/o. Thyagaraj,  
No. 12, Gandhiji 3rd Street,  
Karur Bypass, Erode District,  
Tamil Nadu State– 638 002

**Lease period/Mining period – 10 years**

| PROJECT LOCATION   | PROPOSED PRODUCTION   |
|--|---|
| S.F.No.: 151(P) & 152/4,<br><br><b>Extent: 2.28.40Ha</b><br><br>Kurumbapalayam Village,<br><br>Sathiyamangalam Taluk,<br><br>Erode District.   | <b>Reserves:</b><br>1,45,660m <sup>3</sup> of Rough stone,<br>1,35,030m <sup>3</sup> of Weathered Rock,<br>15,582m <sup>3</sup> of Gravel<br><b>Peak Production = 16,820 m<sup>3</sup> of Rough Stone,</b><br>49,000 m <sup>3</sup> of Weathered Rock,<br>5,270 m <sup>3</sup> of Gravel<br><br>Proposed Depth = <b>41m bgl</b> (1m Gravel +<br>10m Weathered Rock+30m Rough stone) |
| <b>ToR obtained vide</b><br><b>File No.: 10788 ToR Identification No.: T024B0108TN5906337N Dated: 31.05.2024</b>   |   |
| <b>Environmental Consultant</b><br><b>GEO EXPLORATION AND MINING SOLUTIONS</b> <br>Old No. 260-B, New No. 17,<br>Advaita Ashram Road, Alagapuram,<br>Salem – 636 004, Tamil Nadu, India<br> Accredited for sector 1 Cat ‘A’, sector 31 & 38 Cat ‘B’ <br><b>Certificate No : NABET/EIA/2225/RA 0276</b><br>Phone: 0427-2431989,<br>Email: infogeoexploration@gmail.com<br>Web: www.gemssalem.com | <b>Laboratory</b><br><b>EHS 360 LABS PRIVATE LIMITED,</b><br><b>NABL Accredited Laboratory</b><br><b>10/2 Ground floor, 50<sup>th</sup> street,</b><br><b>7<sup>th</sup> Avenue,</b><br><b>Ashok Nagar,</b><br><b>Chennai – 600 083.</b>  |
| <b><u>Baseline Monitoring Period</u></b><br><b>MARCH TO MAY 2024</b>   |   |
| <b>AUGUST 2024</b>   |   |

## **UNDERTAKING**

I Thiru.N.T.Saisada given undertaking that this EIA & EMP report prepared for our Rough stone and Gravel quarry situated in S.F.Nos. 151(P) & 152/4 of Kurumbapalayam Village, Sathyamangalam Taluk, Erode District based on the ToR issued by the State Level Environmental Impact Assessment Authority (SEIAA), Tamil Nadu vide File No.: 10788 ToR Identification No.: T024B0108TN5906337N Dated: 31.05.2024.

I hereby assured that the Data's submitted and information given by me is true and correct to the best of my knowledge.

Signature of the Project Proponent



N.T.Saisada

Place: Erode

Dated:

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## **DECLARATION**

I Dr. M.Ifthikhar Ahmed – EIA Co Ordinator declare that the EIA & EMP report for the Rough stone and Gravel quarry in S.F.Nos. 151 (Part) and 152/4 of Kurumbapalayam Village, Sathyamangalam Taluk, Erode District has been prepared by Geo Exploration and Mining Solutions, Salem, Tamil Nadu.

The Data's provided in the EIA report are true and correct to the best of my knowledge.

Signature of the EIA Co Ordinator



**Dr. M. Ifthikhar Ahmed**

**Managing Partner**

**M/s. Geo Exploration and Mining Solutions**

Place: Salem

Dated:

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For easy representation of Proposed and Existing, Expired and Abandoned Quarries in the Cluster are given unique codes and identifies and studied in this EIA/ EMP Report.

| <b>PROPOSED QUARRY</b>                |                          |                        |   |                     |  |
|---------------------------------------|--------------------------|------------------------|---|---------------------|--|
| <b>CODE</b>                           | <b>Name of the Owner</b> | <b>Village</b>         | <b>S.F. Nos</b>                           | <b>Extent in Ha</b> | <b>Status</b>  |
| P1                                    | Thiru.N.T. Saisada       | Kurumbapalayam Village | 151(P) and 152/4                          | 2.28.40             | ToR Obtained:<br>File No.: 10788 ToR<br>Identification No.:<br>T024B0108TN5906337N<br>Dated: 31.05.2024. |
| P2                                    | Thiru C.Raja             | Kurumbapalayam Village | 138/2A(P),1<br>38/3A(P) &<br>138/4P       | 1.41.96             | EC Granted vide Lr. No.<br>SEIAA-TN /F.No.9916 /1(a)<br>/EC. No: 6157 /2023,<br>dated:07.11.2023         |
| P3                                    | Thiru.Thirunavukarasu    | Kurumbapalayam Village | 148/1,148/1<br>1,148/12,14<br>8/13& 152/4 | 2.18.0              | Under Process  |
| P4                                    | Thiru S.Veenish          | Kurumbapalayam Village | 178                                       | 2.96.50             | 487 <sup>th</sup> SEAC meeting for ToR<br>on 01.08.2024  |
| <b>TOTAL EXTENT</b>                   |                          |                        |   | <b>8.84.86</b>      |  |
| <b>EXISTING QUARRY</b>                |                          |                        |   |                     |  |
| <b>CODE</b>                           | <b>Name of the Owner</b> | <b>Village</b>         | <b>S.F. Nos</b>                           | <b>Extent in Ha</b> | <b>Status</b>  |
| E-1                                   | Thiru.N.T. Saisada       | Kurumbapalayam Village | 152/2 &<br>152/3                          | 1.64.5              | 23.12.2021 to 22.12.2026   |
| <b>TOTAL EXTENT</b>                   |                          |                        |   | <b>1.64.5</b>       |  |
| <b>EXPIRED &amp; ABANDONED QUARRY</b> |                          |                        |   |                     |  |
| Ex-1                                  | Thiru.M.Ramasamy         | Kurumbapalayam Village | 139/2,139/3<br>139/4                      | 3.13.5              | 24.01.2014 to 23.01.2019   |
| <b>TOTAL EXTENT</b>                   |                          |                        |   | <b>3.13.5</b>       |  |
| <b>TOTAL CLUSTER EXTENT</b>           |                          |                        |   | <b>10.49.36</b>     |  |

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

## TERMS OF REFERENCE (ToR) COMPLIANCE

File No.: 10788 ToR Identification No.: T024B0108TN5906337N Dated: 31.05.2024

| <b>SEAC CONDITIONS - SITE SPECIFIC</b> |   |   |
|--|---|---|
| 1                                      | The PP shall conduct specific study on the safety aspects and implications of stone quarrying activity on the stability of the dam structure. The study shall be conducted by the Dam Safety Division of Water Resources Department of Tamil Nadu and the study report shall spell out the buffer zone within which (a) any stone quarrying activity involving drilling and blasting should not permitted and also recommend an extended buffer zone within which such activities can be allowed subject to special conditions which should be spelt out.   | <p>Nearest Dam - Bhavanisagar Dam is situated in 5.0km on the north West side.</p> <p>The blasting will do with different patterns of drilling and blasting for minimal blast induced vibration. Moving forward blasting will be under direct supervision of competent person.</p>                |
| 2                                      | <p>For the existing quarry, the PP shall obtain a letter from the concerned AD (Mines) which shall also stipulate the following information:</p> <p>i. Original pit dimension of the existing quarry</p> <p>ii. Quantity achieved Vs EC Approved Quantity</p> <p>iii. Balance Quantity as per Mineable Reserve calculated.</p> <p>iv. Month wise Production details</p> <p>v. Mined out Depth as on date Vs EC Permitted depth</p> <p>vi. Details of illegal/illicit mining carried out, if any</p> <p>vii. Non-compliance/Violation in the quarry during the past working.</p> <p>viii. Quantity of material mined out outside the mine lease area (or) in the adjacent quarry/land.</p> <p>ix. Existing condition of Safety zone/benches</p> <p>x. Details of any penalties levied on the PP for any violation in the quarry operation by the Department of Geology and Mining.</p> | Not applicable, it is a Fresh lease   |
| 3                                      | The PP shall furnish the consent agreement from the landowner registered with the concerned authority during the EIA appraisal.   | It's a proponent own patta land.  |
| 4                                      | The PP shall complete the fencing, tree plantation and photographs, videos of the same shall be furnished.  | Laying of sheet fence and green belt has been completed by the PP.  |
| 5                                      | The PP shall mark the DGPS reference pillars painted with blue & white colour indicating the safety barrier of 7.5 m to be left under the Rule 13 (1) of MCDR, 1988 within the lease boundary and protective bunds, and provide the details during the EIA appraisal.   | The DGPS pillars erected before the Final appraisal.  |
| 6                                      | The Proponent shall complete the garland drainage around the boundary of the proposed quarry and the photographs indicating the same shall be shown during the EIA appraisal.   | Garland drain will be provided around the boundary of the site  |
| 7                                      | The PP shall submit a detailed hydrological report indicating the impact of proposed quarrying operations on the waterbodies like lake, water tanks, etc located within 1 km of the proposed quarry.  | The hydro-geological study was conducted to evaluate the possible impact on the ground water table. No significant impacts are anticipated on the water bodies around the project area. Details of open wells and borewells within 1km radius along with water level is given in the Chapter No.3 |

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| 8  | The Proponent shall justify the selection of the site for carrying out the stone quarrying with the total volume arrived for the excavation & production adequate details such as lithology of the deposit, reserve estimation, place for waste dump/mined mineral storage, end-use of mined materials, identified potential customers/end-users and travel path.  | <p>The minable reserves are 1,45,660m<sup>3</sup> of Rough stone, 1,35,030m<sup>3</sup> of Weathered Rock &amp; 15,582m<sup>3</sup> of Gravel.</p> <p>The mined minerals are sold on a daily basis and sometimes it is stored in a safety area placed in the north-west side.</p> <p>It will be used for construction project, production of M &amp; P – sand and jelly.</p> <p>From the lease area the travel path connects National Highway (NH) road via Approach &amp; Village Road at a distance of 3.7 km on East side.</p> |
| 9  | 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 with details such as dwelling houses with number of occupants, whether it belongs to the owner (or) not, places of worship, Schools/Colleges 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 enumeration of structure is explained in Chapter 3. Page No. 79.  |
| 10 | The proponent shall furnish photographs and video showing the 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.  | It will be submitted during appraisal.  |
| 11 | During the EIA appraisal, the PP shall furnish the affidavit stating that he will not employ any external agency for carrying out the blasting operation in the proposed quarry and he shall also install the temporary (or) permanent magazine approved by the concerned licensing authority before the execution of the lease, for storing the authorized explosives & detonators separately in accordance with the Explosive Rules, 2008.   | Noted & agreed  |
| 12 | During the EIA appraisal, the PP shall furnish the affidavit stating that he will appoint a First Class/Second Class Mine Manager for managing the quarrying operations before obtaining the CTO from the TNPCB. Further, the PP will also send the 'Notice of Opening' indicating the appointment of such Statutory officials and the proposed usage of HEMM shall be sent to the Director of Mines Safety, Chennai Region of the Mine under the provisions of MMR 1961 atleast 30 days before the commencement of the mining operation after the execution of lease, if the EC is granted. | Noted & agreed  |
| 13 | Since the structures including the houses are situated within a radial distance of 500 m, the PP shall carry out the scientific studies to design the controlled blast parameters for reducing the cumulative blast-induced ground/air- vibrations and eliminating the fly rock from the blasting operations carried out in the cluster of quarries located in the region, and subsequently with proper validation of the design through trial   | The blasting will do with different patterns of drilling and blasting for minimal blast induced vibration. Moving forward blasting will be under direct supervision of competent person   |

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|                                 | <p>blasts in any of the existing &amp; operating quarries to monitor the PPV produced from the blasting in the village (500m) and near the Temples (230 &amp; 300 m), after obtaining the prior permission from the DMS / Chennai Region in accordance with DGMS Circular No. 7 of 1997, by involving anyone of these reputed Research and Academic Institution such as CSIR-Central Institute of Mining &amp; Fuel Research / Dhanbad, NIRM/Bangalore, IIT (ISM)/Dhanbad, IIT-Madras, NIT-Dept of Mining Engg, Surathkal, and Anna University Chennai- CEG Campus. Further the report shall also include the actual data on the air dust particles produced at the time of blasting. A copy of such scientific study report shall be submitted to the SEIAA, MoEF as a part of EIA study during the appraisal and to the DMS/DGMS-Chennai Region while submitting the Notice of Opening, without any deviation.</p>   |  |
| 14                              | <p>Since the quarrying operations are proposed in an existing pit possessing the quarry wall of 25 to 27 m depth without adequate benches in accordance with the provisions of MMR, 1961, the PP shall carry out the scientific studies to assess the slope stability of the working benches and existing quarry wall for spelling out the stabilization measures to ensure the safety of the persons to be employed in the proposed quarry, by involving any one of the reputed Research and Academic Institutions - CSIR-Central Institute of Mining &amp; Fuel Research / Dhanbad, NIRM/Bangalore, IIT (ISM)/Dhanbad, Division of Geotechnical Engineering-IIT-Madras, NIT-Dept of Mining Engg, Surathkal, and Anna University Chennai-CEG Campus. A copy of such scientific study report shall be submitted to the SEIAA, MoEF as a part of EIA study during the appraisal and to the DMS/DGMS-Chennai Region while submitting the Notice of Opening, without any deviation.</p> | Not applicable, it is a fresh lease application. |
| 15                              | <p>The PP shall prepare the Standard Operating Procedures (SoP) for carrying out the 'Best Mining Practices in the areas of drilling, blasting excavation, transportation and green belt development and provide the same during the EIA appraisal.</p>  | Noted & agreed                                   |
| 16                              | <p>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>   | The EMP & its budget detailed in Chapter 10.     |
| <b>SEAC STANDARD CONDITIONS</b> |  |  |
| 1                               | <p>In the case of existing/operating mines, a letter obtained from the concerned AD (Mines) shall be submitted and it shall include the following:<br/> (i) Original pit dimension<br/> (ii) Quantity achieved Vs EC Approved Quantity<br/> (iii) Balance Quantity as per Mineable Reserve calculated.<br/> (iv) Mined out Depth as on date Vs EC Permitted depth<br/> (v) Details of illegal/illicit mining<br/> (vi) Violation in the quarry during the past working.<br/> (vii) Quantity of material mined out outside the mine lease area<br/> (viii) Condition of Safety zone/benches</p>   | Not applicable, it is a fresh lease application. |

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|   | (ix) Revised/Modified Mining Plan showing the benches of not exceeding 6 m height and ultimate depth of not exceeding 50m.   |  |
| 2 | Details of habitations around the proposed mining area and latest VAO certificate regarding the location of habitations within 300m radius from the periphery of the site.   | The danger zone as per the MMR 1961, is observed to be 300m and it is also certified by the VAO that there is no approved habitation within the periphery of 300m. Considering the safety of the environment and surrounding we have proposed mitigation measures in EMP and commit to follow the same |
| 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.   | The enumeration of structure is explained in Chapter 3. Page No.79.  |
| 4 | The PP shall submit a detailed hydrological report indicating the impact of proposed quarrying operations on the waterbodies like lake, water tanks, etc are located within 1 km of the proposed quarry.   | Detailed in Chapter 3.   |
| 5 | The Proponent shall carry out Bio diversity study through reputed Institution and the same shall be included in EIA Report.  | There is no wild life Sanctuary, National Park within the radius of 500m. the area is devoid of major vegetation.<br>The Bio Diversity study has been carried out by the inhouse expert (Ecology and Biodiversity) and the detailed report is given in the Chapter No.3.                               |
| 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 PP obtained a DFO Letter vide R.C.No. 2053/2023/V, Dated: 30.06.2023<br>Nearest forest - Velamundi – 60m – North West  |
| 7 | In the case of proposed lease in an existing (or old) quarry where the benches are not formed (or) partially formed as per the approved Mining Plan, the Project Proponent (PP) shall the PP shall carry out the scientific studies to assess the slope stability of the working benches to be constructed and existing quarry wall, by involving any one of the reputed Research and Academic Institutions - CSIR-Central Institute of Mining & Fuel Research / Dhanbad, NIRM/Bangalore, Division of Geotechnical Engineering-IIT-Madras, NIT-Dept of Mining Engg, Surathkal, and Anna University Chennai-CEG Campus. The PP shall submit a copy of the aforesaid report indicating the stability status of the quarry wall and possible mitigation measures during the time of appraisal for obtaining the EC. | Not applicable, it is a fresh lease application.   |
| 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.   | Site specific slope stability study will be conducted when it reaches 30m. Rs 2.0 lakhs is provided in the EMP budget for slope stability plan.<br>By appointing competent persons, the above slope stability action will be monitored.  |



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| 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   | Proponent given Affidavit stating that the blasting operation will be carried out by the competent person as per the MMR 1961.   |
| 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.  | The Blasting will be carried out by controlled blasting adopting muffle blasting and line drilling. The cost for the controlled blasting is allotted in the EMP, Chapter No.10 Table No. 10.10 Page No.145.  |
| 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.   | One proposed quarry is in the proponent's name (Thiru. N. T. Saisada)<br>Extent: 1.64.5 Ha<br>S. F. No: 152/2 &152/3   |
| 12 | If the proponent has already carried out the mining activity in the proposed mining lease area after 15.01.2016, then the proponent shall furnish the following details from AD/DD, mines  | Not applicable, it is a fresh lease application.   |
| 13 | What was the period of the operation and stoppage of the earlier mines with last work permit issued by the AD/DD mines?  | Not applicable, it is a fresh lease application.   |
| 14 | 14. Quantity of minerals mined out. <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> | Not applicable, it is a fresh lease application.   |
| 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).  | Coordinates for all the boundaries are given in the Chapter No.2 Table No.2.2 Page No.10<br><br>Satellite imagery of the project site marked with Lease boundary, Safety area  |
| 16 | The PP shall carry out Drone video survey covering the cluster, green belt, fencing, etc.,   | Drone video survey covering the Cluster, Greenbelt and fencing will be submitted during appraisal.   |
| 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.   | It will be submitted during appraisal.   |
| 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.   | Mineable Reserves - 1,45,660m <sup>3</sup> of Rough stone, 1,35,030m <sup>3</sup> of Weathered Rock & 15,582m <sup>3</sup> of Gravel<br><br>For First Five Year Production<br>80,530m <sup>3</sup> of Rough stone, 1,35,030m <sup>3</sup> of Weathered Rock & 15,582m <sup>3</sup> of Gravel<br><br>For Second Five Year Production<br>65,130m <sup>3</sup> of Rough stone |

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|    |  | <p>Peak Production<br/>16,820m<sup>3</sup> of Rough stone, 49,000m<sup>3</sup> of Weathered Rock &amp; 5,270m<sup>3</sup> of Gravel</p> <p>Details of Reserves and methodology of mining is given in the Chapter No.2 Page No.19</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.  | Noted and agreed.<br>Detailed under Chapter 6.  |
| 20 | The Project Proponent shall conduct the hydro-geological study considering the contour map of the water table detailing the number of groundwater pumping & open wells, and surface water bodies such as rivers, tanks, canals, ponds, etc. within 1 km (radius) along with the collected water level data for both monsoon and non-monsoon seasons from the PWD/ TWAD so as to assess the impacts on the wells due to mining activity. Based on actual monitored data, it may clearly be shown whether working will intersect groundwater. Necessary data and documentation in this regard may be provided. | The hydro-geological study was conducted to evaluate the possible impact on the ground water table. No significant impacts are anticipated on the water bodies around the project area. Details of open wells and borewells within 1km radius along with water level is given in the Chapter No.  |
| 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.   | 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 to assess the cumulative impact of the proposed project on the environment is prepared.<br>The details of Baseline study are given in the Chapter No. 3. |
| 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.   | The Cumulative impact study due to mining operations is explained in Chapter No.7, Page No.124 to 133.  |
| 23 | Rain water harvesting management with recharging details along with water balance (both monsoon & non-monsoon) be submitted.   | The rain water will be collected in the mine pit at the lower point later it will be utilized for the haul road maintenance, Greenbelt development etc.,  |
| 24 | Land use of the study area delineating forest area, agricultural land, grazing land, wildlife sanctuary, national park, migratory routes of fauna, water bodies, human settlements and other ecological features should be indicated. Land use plan of the mine lease area should be prepared to encompass preoperational, operational and post operational phases and submitted. Impact, if any, of change of land use should be given.   | Land use Land cover study within the radius of 10km is detailed in the Chapter No. 3 Page No.30 to 32   |
| 25 | Details of the land for storage of Overburden/Waste Dumps (or) Rejects outside the mine lease,   | Not applicable,<br>There are no wastages anticipated, the entire quarried out Rough stone material will be utilized.  |

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|    | such as extent of land area, distance from mine lease, its land use, R&R issues, if any, should be provided.   |   |
| 26 | Proximity to Areas declared as 'Critically Polluted' (or) the Project areas which attracts the court restrictions for mining operations, should also be indicated and where so required, clearance certifications from the prescribed Authorities, such as the TNPCB (or) Dept. of Geology and Mining should be secured and furnished to the effect that the proposed mining activities could be considered.   | The area is not declared as Critically polluted area, no court case pending against the project.<br>Proponent obtained Precise area communication letter, Approval for the Mining plan.<br>The Details are enclosed as Annexure |
| 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.   | The rain water collected in the pits after spell of rain will be used for greenbelt development and dust suppression.   |
| 28 | Impact on local transport infrastructure due to the Project should be indicated.   | There is no group of Houses, Schools in the proposed transportation route.<br>Proposed Transportation route with mitigation measures is given in the Chapter No.2 Page No.95  |
| 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.  | The Flora study in the core zone has been carried out and the details are given in the Chapter No.3 Page No.61.   |
| 30 | A detailed mine closure plan for the proposed project shall be included in EIA/EMP report which should be site-specific.   | The mine closure plan is detailed in the Chapter No.4 Page No.110.<br>The budget for the mine closure is included in the Environmental Management plan in Chapter No.10, Table:10.10, Page No.145.                              |
| 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 Flora and Fauna study around the vicinity of the site is carried out by the Functional area experts along with Local School Students.   |
| 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. | The plantation in the project site will be carried out using native and mixed plantation. The recommended species for the plantation is given in the Chapter No.4 Table No.4.10, Page No.108.                                   |
| 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   | Noted and agreed.<br>The plantation in the project site will be carried out using native and mixed plantation. The recommended species for the plantation is given in the Chapter No.4 Table No.4.10 Page No.105.               |
| 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.  | Disaster management Plan is detailed in the Chapter No.7.   |

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| 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 and management Plan detailed in the Chapter No.7.  |
| 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 with mitigation measures are detailed in the Chapter No.7.<br>Details of Periodical Medical Examination given in the Chapter No.10, Page No.143.  |
| 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.  | The details of the population in the impact zone (within 500m radius) are detailed in the Chapter No.3.  |
| 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.                                      | Socio Economic study covering 10 km radius is detailed in the Chapter No.3 Page No.78.   |
| 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 court case and litigation pending against the 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.  | It is explained in Chapter -3- socio economic study  |
| 41                               | If any quarrying operations were carried out in the proposed quarrying site for which now the EC is sought, the Project Proponent shall furnish the detailed compliance to EC conditions given in the previous EC with the site photographs which shall duly be certified by MoEF&CC, Regional Office, Chennai (or) the concerned DEE/TNPCB  | Not applicable, the project is fresh proposal.   |
| 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   | The EMP has been prepared for the entire life of the mine. Proponent given affidavit stating the EMP will be submitted during the appraisal after completion of public hearing.  |
| 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.   | Noted and agreed   |
| <b>SEIAA STANDARD CONDITIONS</b> |  |  |
| 1                                | Impacts on Energy requirement.   | 89,542Liters of HSD will be utilized for entire project life.<br>Mining operations have been significant contributors to greenhouse gas (GHG) emissions due to using Disel.<br>It will be controlled by green belt and water sprinkling for dust supersession. |
| 2                                | Impacts on living System (air, water, soil & microorganism).   | Impact and mitigations are Detailed in Chapter 4.  |

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| 3  | Impacts on terrestrial & aquatic within and surrounding areas.  | Impact and mitigations are Detailed in Chapter 4.  |
| 4  | 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 furnish the detailed EMP mentioning all the CER activities as committed with the action plan. | Proponent agreed to spend the amount of Rs.5 Lakhs in lieu of CER towards mitigation cost / conservation cost for the Sathiyamangalam Tiger reserve located at a distance of 8.77 km – North West in the form Demand Draft.<br><br>Plantation activities are done in the Panchayat Union Primary School, Kurumbapalayam Village. |
| 5  | All the construction of Buildings shall be energy efficient and confirm to the green building norms.  | Measures taken to maintain a stable environment include water sprinkling to suppress dust & green belt to control greenhouse emission.<br><br>The existing pit will be used as rain water storage tank.  |
| 6  | The proponent shall provide adequate parking facility for vehicles of all the workers & visitors.   | The PP will provide parking facility   |
| 7  | The proponent shall ensure that no treated or untreated trade effluent/sewage discharged outside the premises under any circumstances.  | There is no untreated effluent/ Sewage   |
| 8  | The disaster management and disaster mitigation standards to be seriously adhered to avoid of calamities.   | Detailed in Chapter 10.  |
| 9  | The proponent shall provide the action taken for reduction of greenhouse gas emissions to support the climatic action to make it sustainable buildings.   | Measures taken to maintain a stable environment include water sprinkling to suppress dust & green belt to control greenhouse emission.<br><br>The existing pit will be used as rain water storage tank.  |
| 10 | The project proponent shall furnish the action taken to provide adequate parking space for visitors of all inmates including clean traffic plan.  | Noted & agreed   |
| 11 | The project proponent shall furnish the action taken to improve water usage efficiency in the building.   | Dust Suppression – 0.8 KLD<br>Green Belt – 0.9 KLD<br>Sanitation & Drinking – 0.6 KLD<br>Total – 2.3 KLD   |
| 12 | The project proponent shall conduct detailed study of biodiversity flora & fauna including invasives /endemic vulnerable species.   | The Flora and Fauna study around the vicinity of the site is carried out by the Functional area experts along with Local School Students.  |
| 13 | The project proponent shall furnish NOC obtained from competent authority that there is no encroachment of water bodies (including canals).   | It will be submitted during appraisal.   |
| 14 | The project proponent shall furnish impact of Green House Gases emissions and climate change likely due to activities.  | Measures taken to maintain a stable environment include water sprinkling to suppress dust & green belt to control greenhouse emission.<br><br>The existing pit will be used as rain water storage tank.  |
| 15 | The project proponent shall conduct detailed soil investigation including microflora /fauna.  | Soil management detailed in Chapter 10. Page no.138.   |
| 16 | The project proponent shall study impact on livelihoods of locals.  | The nearest habitation is 550m – SW side.  |

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|    |  | Mining operations has positive impact on environment and socio economy. Sustainable and modern mining leads us to see positive impact of mining operation and providing consistent employment for nearly 27 people directly in the proposed projects and indirectly around 50 people. |
| 17 | The project proponent shall furnish List of trees available in the area.         | Poovarasu, Vembu, Mahogany, Illupai, Pungan. Magilam  |
| 18 | The project proponent shall study impact of activities on water bodies/wetlands. | Detailed in Chapter 3.  |
| 19 | The project proponent shall conduct studies on invasive and alien species.       | Detailed in Chapter 3.  |

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

| S. No | Terms of Reference   | Reply  |
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| 1.1   | An EIA-EMP Report shall be prepared for peak capacity (MTPA) operation in an ML/project area of.....ha based on the generic structure specified in Appendix III of the EIA Notification, 2006.   | Noted and agreed   |
| 1.2   | An EIA-EMP Report would be prepared for peak capacity operation to cover the impacts and environment management plan for the project specific activities on the environment of the region, and the environmental quality encompassing air, water, land, biotic community, etc. through collection of data and information, generation of data on impacts including prediction modeling for.... MTPA of mineral production based on approved project/Mining Plan for.... MTPA. Baseline data collection can be for any season (three months) except monsoon.  | Peak capacity of 16,820m <sup>3</sup> operation to cover the impacts and environment management plan in chapter-IV and Chapter 10 covered in project specific activities.<br><br>Baseline Data were collected for March – May 2024 as per CPCB Notification and MoEF & CC Guidelines. Details in Chapter No. III |
| 1.3   | Proper KML file with pin drop and coordinate of mine at 500-1000 m interval be provided.   | Noted, Google earth image showing lease area with Coordinates of pillars in chapter-II.  |
| 1.4   | A Study area map of the core zone (project area) and 10 km area of the buffer zone (1: 50,000 scale) clearly delineating the major topographical features such as the land use, surface drainage pattern including rivers/streams/nullahs/canals, locations of human habitations, major constructions including railways, roads, pipelines, major industries, mines, and other polluting sources. In case of ecologically sensitive areas such as Biosphere Reserves/National Parks/WL Sanctuaries/ Elephant Reserves, forests (Reserved/Protected), migratory corridors of fauna, and areas where endangered fauna and plants of medicinal and economic importance found in the 15 km study area should be given. The above details to be furnished in tabular form also. | Land use and land cover of the 10km Radius of study area is discussed in Chapter No. III.<br><br>Geology map of the project area covering 10km radius Figure No. 2.7, Page No. 18.<br>Geomorphology of the area is given in Chapter No 2 Figure No 2.8, Page No. 18.   |

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| 1.5  | Map showing the core zone delineating the agricultural land (irrigated and un-irrigated, uncultivable land as defined in the revenue records, forest areas (as per records), along with other physical features such as water bodies, etc. should be furnished.   | Land use and land cover of the study area is discussed in Chapter No. III with Physical features such as waterbodies, odai, canal etc.,   |
| 1.6  | A contour map showing the area drainage of the core zone and 25 km of the study area (where the water courses of the core zone ultimately join the major rivers/streams outside the lease/project area) should also be clearly indicated in the separate map.   | DEM data using Drainage pattern around 10km radius showing streams and lakes etc., discussed in Chapter No. 3.  |
| 1.7  | Catchment area with its drainage map of 25 km area within and outside the mine shall be provided with names, details of rivers/ river let system and its respective order. The map should clearly indicate drainage pattern of the catchment area with basin of major rivers. Diversion of drains/ river need elaboration in form of length, quantity and quality of water to be diverted.  | Drainage pattern around 10km radius showing streams and lakes etc. is discussed in Chapter No. 3.   |
| 1.8  | (Details of mineral reserves, geological status of the study area and the seams to be worked, ultimate working depth and progressive stage-wise working scheme until the end of mine life should be provided on the basis of the approved rated capacity and calendar plans of production from the approved Mining Plan. Geological maps and sections should be included. The Progressive mine development and Conceptual Final Mine Closure Plan should also be shown in figures. Details of mine plan and mine closure plan approval of Competent Authority should be furnished for green field and expansion projects. | Details in chapter-2 showing the land features. And also enclosed Approved mining plan in annexure  |
| 1.9  | Details of mining methods, technology, equipment to be used, etc., rationale for selection of specified technology and equipment proposed to be used vis-à-vis the potential impacts should be provided.  | It is an opencast quarrying operation proposed to operate in Mechanized method. The Rough Stone quarry formation is a hard, compact and homogeneous body.<br>The height and width of the bench will be maintained as 5m with 90 <sup>0</sup> bench angles.<br>Quarrying activities will be carried out under the supervision of Competent Persons like Mines Manager, Mines Foreman and Mining Mate.<br>Necessary permissions will be obtained from DGMS after obtaining Environmental Clearance. |
| 1.10 | Impact of mining on hydrology, modification of natural drainage, diversion and channeling of the existing rivers/water courses flowing through the ML and adjoining the lease/project and the impact on the existing users and impacts of mining operations   | Impact Studies and Mitigation Measures of Water Environment including Surface Water and Ground Water are discussed in Chapter 4.  |

| 1.11                      | <p>A detailed Site plan of the mine showing the proposed break-up of the land for mining operations such as the quarry area, OB dumps, green belt, safety zone, buildings, infrastructure, Stockyard, township/colony (within and adjacent to the ML), undisturbed area -if any, and landscape features such as existing roads, drains/natural water bodies to be left undisturbed along with any natural drainage adjoining the lease /project areas, and modification of thereof in terms of construction of embankments/bunds, proposed diversion/re-channelling of the water courses, etc., approach roads, major haul roads, etc should be indicated.</p>  | <p>Not Applicable.<br/>The details of waste dump management are given in the Chapter No. 4</p>   |      |                              |  |     |            |      |     |                      |  |  |  |  |  |            |      |   |                   |  |  |   |             |  |  |   |              |  |  |   |             |  |  |   |                  |  |  |  |
|---------------------------|---|--|------|------------------------------|--|-----|------------|------|-----|----------------------|--|--|--|--|--|------------|------|---|-------------------|--|--|---|-------------|--|--|---|--------------|--|--|---|-------------|--|--|---|------------------|--|--|--|
| 1.12                      | <p>Original land use (agricultural land/forestland/grazing land/wasteland/water bodies) of the area should be provided as per the tables given below. Impacts of project, if any on the land use, in particular, agricultural land/forestland/grazing land/water bodies falling within the lease/project and acquired for mining operations should be analyzed. Extent of area under surface rights and under mining rights should be specified. Area under Surface Rights</p> <table border="1"> <thead> <tr> <th colspan="2">Area under Surface Rights</th> <th colspan="2">Area Under Mining Rights(ha)</th> </tr> <tr> <th>S.N</th> <th>ML/Project</th> <th>Land</th> <th>use</th> </tr> </thead> <tbody> <tr> <td colspan="4">Area under Both (ha)</td> </tr> <tr> <td></td> <td></td> <td>Rights(ha)</td> <td>(ha)</td> </tr> <tr> <td>1</td> <td>Agricultural land</td> <td></td> <td></td> </tr> <tr> <td>2</td> <td>Forest Land</td> <td></td> <td></td> </tr> <tr> <td>3</td> <td>Grazing Land</td> <td></td> <td></td> </tr> <tr> <td>4</td> <td>Settlements</td> <td></td> <td></td> </tr> <tr> <td>5</td> <td>Others (specify)</td> <td></td> <td></td> </tr> </tbody> </table> | Area under Surface Rights  |      | Area Under Mining Rights(ha) |  | S.N | ML/Project | Land | use | Area under Both (ha) |  |  |  |  |  | Rights(ha) | (ha) | 1 | Agricultural land |  |  | 2 | Forest Land |  |  | 3 | Grazing Land |  |  | 4 | Settlements |  |  | 5 | Others (specify) |  |  | <p>Land use and land cover of the study area is discussed in Chapter No. 3.<br/>Land use plan of the project area showing pre-operational, operational and post-operational phases are discussed in Chapter No. 2, Table No 2.3.</p> |
| Area under Surface Rights |   | Area Under Mining Rights(ha)   |      |                              |  |     |            |      |     |                      |  |  |  |  |  |            |      |   |                   |  |  |   |             |  |  |   |              |  |  |   |             |  |  |   |                  |  |  |  |
| S.N                       | ML/Project  | Land   | use  |                              |  |     |            |      |     |                      |  |  |  |  |  |            |      |   |                   |  |  |   |             |  |  |   |              |  |  |   |             |  |  |   |                  |  |  |  |
| Area under Both (ha)      |   |  |      |                              |  |     |            |      |     |                      |  |  |  |  |  |            |      |   |                   |  |  |   |             |  |  |   |              |  |  |   |             |  |  |   |                  |  |  |  |
|                           |   | Rights(ha)   | (ha) |                              |  |     |            |      |     |                      |  |  |  |  |  |            |      |   |                   |  |  |   |             |  |  |   |              |  |  |   |             |  |  |   |                  |  |  |  |
| 1                         | Agricultural land   |  |      |                              |  |     |            |      |     |                      |  |  |  |  |  |            |      |   |                   |  |  |   |             |  |  |   |              |  |  |   |             |  |  |   |                  |  |  |  |
| 2                         | Forest Land   |  |      |                              |  |     |            |      |     |                      |  |  |  |  |  |            |      |   |                   |  |  |   |             |  |  |   |              |  |  |   |             |  |  |   |                  |  |  |  |
| 3                         | Grazing Land  |  |      |                              |  |     |            |      |     |                      |  |  |  |  |  |            |      |   |                   |  |  |   |             |  |  |   |              |  |  |   |             |  |  |   |                  |  |  |  |
| 4                         | Settlements   |  |      |                              |  |     |            |      |     |                      |  |  |  |  |  |            |      |   |                   |  |  |   |             |  |  |   |              |  |  |   |             |  |  |   |                  |  |  |  |
| 5                         | Others (specify)  |  |      |                              |  |     |            |      |     |                      |  |  |  |  |  |            |      |   |                   |  |  |   |             |  |  |   |              |  |  |   |             |  |  |   |                  |  |  |  |
| 1.13                      | <p>Study on the existing flora and fauna in the study area (10km) should be carried out by an institution of relevant discipline. The list of flora and fauna duly authenticated separately for the core and study area and a statement clearly specifying whether the study area forms a part of the migratory corridor of any endangered fauna should be given. If the study area has endangered flora and fauna, or if the area is occasionally visited or used as a habitat by Schedule-I species, or if the project falls within 15 km of an ecologically sensitive area, or used as a migratory corridor then a Comprehensive Conservation Plan along with the appropriate budgetary provision should be prepared and submitted with EIA-EMP Report; and comments/observation from the CWLW of the State Govt. should also be obtained and furnished.</p>   | <p>Detailed biological study of the study area [core zone and buffer zone (10 km radius of the periphery of the mine lease)] was carried out and discussed under Chapter No. 3.<br/>There is no schedule I species of animals observed within study area as per Wildlife Protection Act 1972 as well as no species is in vulnerable, endangered or threatened category as per IUCN. There is no endangered red list species found in the study area.</p> |      |                              |  |     |            |      |     |                      |  |  |  |  |  |            |      |   |                   |  |  |   |             |  |  |   |              |  |  |   |             |  |  |   |                  |  |  |  |



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| 1.14 | One-season (other than monsoon) primary baseline data on environmental quality - air (PM10, PM2.5, SOx, NOx and heavy metals such as Hg, Pb, Cr, As, etc), noise, water (surface and groundwater), soil - along with one-season met data coinciding with the same season for AAQ collection period should be provided. The detail of NABL/MoEF&CC certification of the respective laboratory and NABET accreditation of the consultant to be provided.  | Baseline Data were collected for March – May 2024 as per CPCB Notification and MoEF & CC Guidelines. Details in Chapter No. 3.   |
| 1.15 | Map (1: 50, 000 scale) of the study area (core and buffer zone) showing the location of various sampling stations superimposed with location of habitats, other industries/mines, polluting sources, should be provided. The number and location of the sampling stations in both core and buffer zones should be selected on the basis of size of lease/project area, the proposed impacts in the downwind (air) / downstream (surface water)/groundwater regime (based on flow). One station should be in the upwind/upstream/non-impact/non-polluting area as a control station. The monitoring should be as per CPCB guidelines and parameters for water testing for both ground water and surface water as per ISI standards and CPCB classification wherever applicable. Observed values should be provided along with the specified standards. | Details in chapter-3 showing the various sampling stations As per CPCB guidelines.   |
| 1.16 | For proper baseline air quality assessment, Wind rose pattern in the area should be reviewed and accordingly location of AAMSQ shall be planned by the collection of air quality data by adequate monitoring stations in the downwind areas. Monitoring location for collecting baseline data should cover overall the 10 km buffer zone i.e., dispersed in 10 km buffer area. In case of expansion, the displayed data of CAAQMS and its comparison with the monitoring data to be provided.   | Air Quality Modelling and wind rose pattern for prediction of incremental GLC's of pollutant was carried out using AERMOD view 13 Model. Details in Chapter No. 4.   |
| 1.17 | A detailed traffic study along with presence of habitation in 100 mts distance from both side of road, the impact on the air quality with its proper measures and plan of action with timeline for widening of road. The project will increase the no. of vehicle along the road which will indirectly contribute to carbon emission so what will be the compensatory action plan should be clearly spell out in EIA/ EMP report.   | Traffic density survey was carried out to analyses the impact of Transportation in the study area as per IRC guidelines 1961 and it is inferred that there is no significant impact due to the proposed transportation from the project area. Details in Chapter-II. |

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| 1.18 | The socio-economic study to be conducted with actual survey report and a comparative assessment to be provided from the census data should be provided in EIA/ EMP report also occupational status & economic status of the study area and what economically project will contribute should be clearly mention. The study should also include the status of infrastructural facilities and amenities present in the study area and a comparative assessment with census data to be provided and to link it with the initialization and quantification of need-based survey for CSR activities to be followed. | Detailed in chapter-3 socio-economic study with occupational status & economic status of the study area. The study should also include the status of infrastructural facilities and amenities present in the study area<br><br>CSR are discussed under Chapter 8. |
| 1.19 | The Ecology and biodiversity study should also indicate the likely impact of change in forest area for surface infrastructural development or mining activity in relation to the climate change of that area and what will be the compensatory measure to be adopted by PP to minimize the impact of forest diversion.  | Detailed Ecology and biodiversity study in chapter-3  |
| 1.20 | Baseline data on the health of the population in the impact zone and measures for occupational health and safety of the personnel and manpower for the mine should be submitted.  | Detailed in chapter-4 population in the impact zone and measures for occupational health and safety and proposed occupational health in chapter-X   |
| 1.21 | Impact of proposed project/activity on hydrological regime of the area shall be assessed and report be submitted. Hydrological studies as per GEC 2015 guidelines to be prepared and submitted.   | Noted and agreed  |
| 1.22 | Impact of mining and water abstraction from the mine on the hydrogeology and groundwater regime within the core zone and 10 km buffer zone including long-term monitoring measures should be provided. Details of rainwater harvesting and measures for recharge of groundwater should be reflected in case there is a declining trend of groundwater availability and/or if the area falls within dark/grey zone.  | The ground water table is at 68-73m BGL.<br>In these projects, ultimate depth is 41m BGL.<br><br>It is inferred the quarrying activities in the Cumulative EIA project (Quarry) will not intersect the Ground water table.  |
| 1.23 | Study on land subsidence including modeling for prediction, mitigation/prevention of subsidence, continuous monitoring measures, and safety issues should be carried out.   | Detailed in Chapter-IV Anticipated and mitigation measures of in the study area.  |
| 1.24 | Detailed water balance should be provided. The breakup of water requirement as per different activities in the mining operations, including use of water for sand stowing should be given separately. Source of water for use in mine, sanction of the Competent Authority in the State Govt. and impacts vis-à-vis the competing users should be provided.   | Total Water Requirement: 2.3 KLD<br>Discussed under Chapter 2, Table No 2.13, Page No. 26. The required water will be met from rainwater accumulated in mine pit (when available) and from the approved water vendors.  |
| 1.25 | PP shall submit design details of all Air Pollution control equipment (APCEs) to be implemented as part of Environment Management Plan vis-à-vis reduction in concentration of emission for each APCEs  | Methodology And Instrument Used for Air Quality Analysis in chapter-3 and Air Pollution control equipment (APCEs) in chapter-10 sub 10.2 Environmental policy.  |

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| 1.26 | PP shall propose to use LNG/CNG based mining machineries and trucks for mining operation and transportation of mineral. The measures adopted to conserve energy or use of renewable sources shall be explored.   | Details in Machinery and equipment's details in Chapter-2   |
| 1.27 | Site specific Impact assessment with its mitigation measures, Risk Assessment and Disaster Preparedness and Management Plan should be provided.  | A Risk Assessment and Disaster Preparedness and management Plan Chapter- 7  |
| 1.28 | Impact of choice of mining method, technology, selected use of machinery and impact on air quality, mineral transportation, handling & storage/stockyard, etc, Impact of blasting, noise and vibrations should be provided.  | Detailed in Machinery and technology used Chapter-3<br>Table 3.17 – Methodology and Instrument Used for Air Quality Analysis<br>Detailed study in chapter-4 Impact of choice of mining method and impact on air quality and blasting and noise and vibrations.  |
| 1.29 | Impacts of mineral transportation within the mining area and outside the lease/project along with flow-chart indicating the specific areas generating fugitive emissions should be provided. Impacts of transportation, handling, transfer of mineral and waste on air quality, generation of effluents from workshop etc, management plan for maintenance of HEMM and other machinery/equipment should be given. Details of various facilities such as rest areas and canteen for workers and effluents/pollution load emanating from these activities should also be provided. | Traffic density survey was carried out to analyses the impact of Transportation in the study area as per IRC guidelines 1961 and it is inferred that there is no much significant impact due to the proposed transportation from the project area. Details in Chapter 2.<br><br>Infrastructure & other facilities will be provided to the Mine Workers after the grant of quarry lease and the same has been discussed in the Chapter No.2. |
| 1.30 | Details of various facilities to be provided to the workers in terms of parking, rest areas and canteen, and effluents/pollution load resulting from these activities should also be given.  | Infrastructure & other facilities will be provided to the Mine Workers after the grant of quarry lease and the same has been discussed in the Chapter No.2  |
| 1.31 | The number and efficiency of mobile/static water jet, Fog cannon sprinkling system along the main mineral transportation road inside the mine, approach roads to the mine/stockyard/siding, and also the frequency of their use in impacting air quality should be provided.   | Noted and agreed  |
| 1.32 | Conceptual Final Mine Closure Plan and post mining land use and restoration of land/habitat to the pre-mining status should be provided. A Plan for the ecological restoration of the mined-out area and post mining land use should be prepared with detailed cost provisions. Impact and management of wastes and  | Discussed under Chapter 2.<br>Mine Closure Plan is a part of Approved Mining Plan enclosed as Annexure Volume – 1.  |
| 1.33 | Adequate greenbelt nearby areas, mineral stock yard and transportation area of mineral shall be provided with details of species selected and survival rate Greenbelt development should be undertaken particularly around the transport route.  | Greenbelt Development Plan is discussed under Chapter 4,  |
| 1.34 | Cost of EMP (capital and recurring) should be included in the project cost and for progressive and final mine closure plan.  | The total cost and the details are given in the Chapter No. 10.   |

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| 1.35 | Details of R&R. Detailed project specific R&R Plan with data on the existing socio- economic status of the population (including tribals, SC/ST, BPL families) found in the study area and broad plan for resettlement of the displaced population, site for the resettlement colony, alternate livelihood concerns/employment for the displaced people, civic and housing amenities being offered, etc and costs along with the schedule of the implementation of the R&R Plan should be given. | Not Applicable.<br>There are no approved habitations within a radius of 300 meters.<br>Therefore, R&R Plan / Compensation details for the Project Affected People (PAP) is not anticipated and Not Applicable for this project. |
| 1.36 | CSR Plan along with details of villages and specific budgetary provisions (capital and recurring) for specific activities over the life of the project should be given.  | CSR are discussed under Chapter 8. And specific budgetary provisions (capital and recurring) for specific activities over the life of the project in chapter-10   |
| 1.37 | Corporate Environment Responsibility:  | CER are discussed under Chapter 8.  |
| 1.38 | a) The Company must have a well laid down Environment Policy approved by the Board of Directors.   | Noted and agreed  |
| 1.39 | b) The Environment Policy must prescribe for standard operating process/procedures to bring into focus any infringements/deviation/violation of the  | Detailed in chapter-10 The Environment Policy   |
| 1.40 | c) The hierarchical system or Administrative Order of the company to deal with environmental issues and for ensuring compliance with the environmental clearance conditions must be furnished.   | Noted and agreed  |
| 1.41 | d) To have proper checks and balances, the company should have a well laid down 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.  | Noted and agreed  |
| 1.42 | e) Environment Management Cell and its responsibilities to be clearly spleel out in EIA/ EMP report  | The Environment Monitoring Cell discussed under Chapter 6   |
| 1.43 | f) In built mechanism of self-monitoring of compliance of environmental regulations should be indicated.   | Noted and agreed  |
| 1.44 | Status of any litigations/ court cases filed/pending on the project should be provided.  | No litigation is pending in any court against this project  |
| 1.45 | PP shall submit clarification from DFO that mine does not fall under corridors of any National Park and Wildlife Sanctuary with certified map showing distance of nearest sanctuary.   | Velamundi – 60m – North West<br>R.C.No. 2053/2023/V, Dated: 30.06.2023  |
| 1.46 | Copy of clearances/approvals such as Forestry clearances, Mining Plan Approval, mine closer plan approval. NOC from Flood and Irrigation Dept. (if req.), etc. wherever applicable   | Noted and agreed  |
| 1.47 | Details on the Forest Clearance should be given as per the format given:<br>Total ML Total Balance area for which Status of apply For Project Area Forest Date Extent of FC is   | Noted and agreed  |

|             |  |  |
|-------------|--|--|
| <b>1.48</b> | In case of expansion of the proposal, the status of the work done as per mining plan and approved mine closure plan shall be detailed in EIA/ EMP report.  | Enclosed Approved mining plan in Annexure volume-I                         |
| <b>1.49</b> | Details on Public Hearing should cover the information relating to notices issued in the newspaper, proceedings/minutes of Public Hearing, the points raised by the general public and PP shall carry out survey through drone highlighting the ground reality for atleast 10 minutes. | The outcome of public hearing will be updated in the final EIA/AMP report. |
| <b>1.51</b> | Detailed Chronology of the project starting from the first lease deed allotted/Block allotment/ Land   | Noted and agreed   |
| <b>1.52</b> | The first page of the EIA/ EMP report must mention the peak capacity production, area, detail of PP, Consultant (NABET accreditation) and Laboratory (NABL / MoEF & CC certification)  | Noted and agreed   |
| <b>1.53</b> | The compliances of ToR must be properly cited with respective chapter section and page no in tabular form and also mention sequence of the respective ToR complied within the EIA-EMP report in all the chapter's section.   | Noted and agreed   |
| <b>1.54</b> | PP to evaluate the greenhouse emission gases from the mine operation/ washery plant and corresponding carbon absorption plan.  | Noted and agreed   |

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## 1.INTRODUCTION

### 1.0 PREAMBLE

#### Project history: -

The project proponent Thiru. N.T.Saisada applied for Rough stone and Gravel quarry over an extent of 2.28.40 Ha in S.F.Nos. 151 (Part) and 152/4 of Kurumbapalayam Village, Sathyamangalam Taluk, Erode District.

- Proponent applied for Rough stone and Gravel quarry lease on 16.03.2023
- Precise area communication letter was issued by the Deputy Director vide Rc.No. 152/Mines/2023, Dated:12.02.2024
- The Mining plan has been prepared by the Qualified person and got approval vide Letter Rc.No. 152/Mines/2023, Dated:04.03.2024
- The Mining plan has been approved for the quantity of 1,45,660m<sup>3</sup> of rough stone,1,35,030m<sup>3</sup> of weathered rock and 15,582 of Gravel up to the depth of 41m bgl for the period of Ten years.

As per the EIA Notification, 2006 and subsequent amendments and OM The proposal falls in the B1 Category (Cluster quarries - 4 proposal and 1 Existing quarry forming Cluster Category {Total Extent of the Cluster is 10.49.36 Ha}- Cluster area calculated as per MoEF& CC Notification S.O. 2269(E) Dated 1<sup>st</sup> July 2016).

- Proponent applied for Terms of Reference vide Proposal No. SIA/TN/MIN/467395/2024, Dated:02/05/2024 and the ToR Was Granted vide File No.: 10788 ToR Identification No.: T024B0108TN5906337N Dated: 31.05.2024.

Based on the ToR Baseline Monitoring study has been carried out for one season i.e., **March to May 2024** and this EIA/EMP report is prepared for considering cumulative impacts arising out of these projects, the Cumulative Environmental Impact Assessment study is undertaken, which is followed by preparation of a detailed Environmental Management Plan (EMP) to minimize those adverse impacts.

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

### 1.1 PURPOSE OF THE REPORT

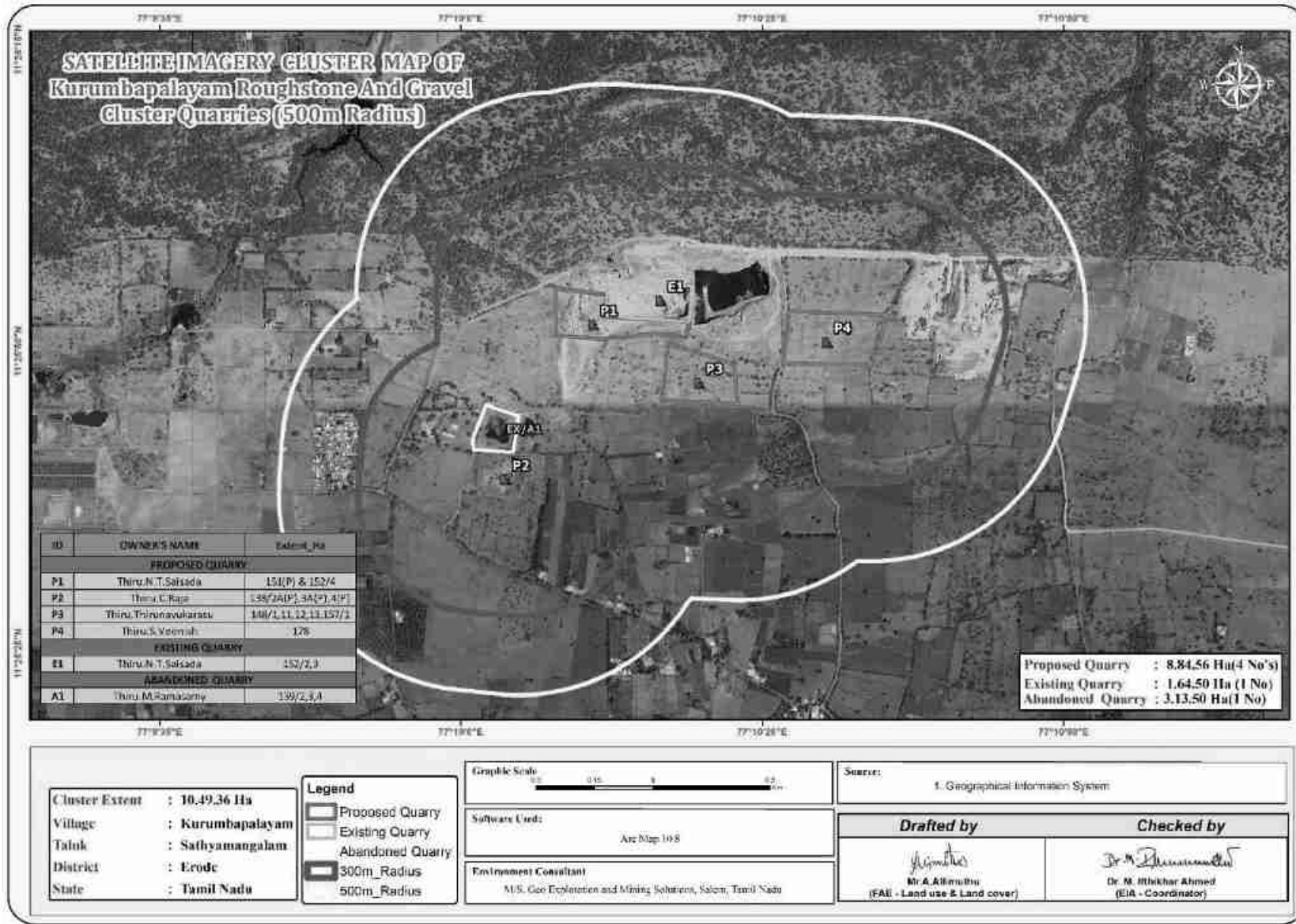
The Ministry of Environment and Forests, Govt. of India, through its EIA notification S.O. 1533(E) of 14<sup>th</sup> September 2006 and its subsequent amendments as per Gazette Notification S.O. 1886 of 20<sup>th</sup> April 2022, Mining Projects are classified under two categories i.e. A (>250 Ha) and B (≤ 250 Ha), and Schematic Presentation of Requirements on Environmental Clearance of Minor Minerals including cluster situation in Appendix–XI.

Now, as per Order Dated: 04.09.2018 & 13.09.2018 passed by Hon'ble National Green Tribunal, New Delhi in O.A. No. 173 of 2018 & O.A. No, 186 of 2016 and MoEF& CC Office Memorandum F. No. L-11011/175/2018-IA-II (M) Dated: 12.12.2018 clarified the requirement for EIA, EMP and therefore, Public Consultation for all areas from 5 to 25 ha falling in Category B1 and appraised by SEAC/ SEIAA as well as for cluster situation.

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

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

FIGURE 1.1 SATELLITE IMAGERY CLUSTER QUARRIES





## 1.2 IDENTIFICATION OF PROJECT AND PROJECT PROPONENTS

### 1.2.1 Identification of Project Proponent

**TABLE 1.1: DETAILS OF PROJECT PROPONENT**

|                                      |  |
|--------------------------------------|--|
| <b>Name of the Project Proponent</b> | Thiru. N.T. Saisada Rough Stone and Gravel Quarry                                      |
| <b>Address</b>                       | S/o. Thyagaraj, No. 12, Gandhiji 3rd Street,<br>Karur Bypass, Erode District - 638 002 |
| <b>Mobile</b>                        | 99866 00066  |
| <b>Email</b>                         | ntsaisada@gmail.com  |
| <b>Status</b>                        | Individual   |

### 1.2.2 Identification of Project

**TABLE 1.2: SALIENT FEATURES OF THE PROPOSED PROJECT**

|                            |   |                                  |                          |
|----------------------------|---|----------------------------------|--------------------------|
| Name of the Project        | Thiru.N.T. Saisada Rough stone and Gravel quarry  |                                  |                          |
| S.F. No.                   | 151(P) & 152/4  |                                  |                          |
| Extent                     | 2.28.40 ha  |                                  |                          |
| Village Taluk and District | Kurumbapalayam Village, Sathiyamangalam Taluk, Erode District   |                                  |                          |
| Land Type                  | Proponent own patta land  |                                  |                          |
| Toposheet No               | 58 - E/03   |                                  |                          |
| Latitude between           | 11°25'51.36"N to 11°25'55.19"N  |                                  |                          |
| Longitude between          | 77°10'07.83"E to 77°10'18.95"E  |                                  |                          |
| Elevation of the area      | 330m AMSL   |                                  |                          |
| Lease period               | 10 Years  |                                  |                          |
| Mining Plan period         | 10 years  |                                  |                          |
| Proposed Depth of Mining   | 41m bgl (1m Gravel +10m Weathered Rock + 30m Rough Stone)   |                                  |                          |
|                            | Rough Stone in m <sup>3</sup>   | Weathered Rock in m <sup>3</sup> | Gravel in m <sup>3</sup> |
| Geological Resources       | 6,85,200  | 2,28,400                         | 22,840                   |
| Mineable Reserves          | 1,45,660  | 1,35,030                         | 15,582                   |
| Year wise Production       | 1,45,660  | 1,35,030                         | 15,582                   |
| Peak Production            | 16,820  | 49,000                           | 5,270                    |
| Ultimate Pit Dimension     | 294m (L) x 87m (W) x 41m(D) bgl   |                                  |                          |
| Water Level in the region  | 68 – 73 m bgl   |                                  |                          |
| Method of Mining           | Opencast Mechanized Mining Method involving small drilling and Controlled blasting using Slurry Explosives  |                                  |                          |
| Topography                 | The lease applied area is a Plain topography. The area has gentle sloping towards South eastern side and altitude of the area is 330m (max) above from Mean Sea level. The area is covered by 1m thickness of Gravel, 10m thickness of weathered rocks and followed by Massive Charnockite which is clearly inferred from the existing quarry pit situated on the eastern side. |                                  |                          |
| Machinery proposed         | Jack Hammer   | 4 Nos                            |                          |
|                            | Compressor  | 1 No                             |                          |
|                            | Excavator with Bucket and Rock Breaker  | 1 No                             |                          |
|                            | Tipper  | 3 Nos                            |                          |
|                            | Water sprinkler   | 1 No                             |                          |
| Blasting Method            | Controlled Blasting Method by shot hole drilling and small dia of 25mm slurry explosive are proposed to be used for shattering and heaving effect for removal and winning of Rough Stone. No deep hole drilling is proposed.  |                                  |                          |

|                              |   |              |
|------------------------------|---|--------------|
| Proposed Manpower Deployment | 27 Nos  |              |
| Project Cost                 | Rs. 84,20,000/-   |              |
| EMP Cost                     | Rs.7,60,000/-   |              |
| Total Project cost           | Rs.91,80,000/-  |              |
| CER Cost                     | Rs.5,00,000/-   |              |
| Nearby Water Bodies          | O dai   | 180m – South |
|                              | O dai   | 650m_NW      |
|                              | Lower Bhavani Main Canal  | 3.7Km_N      |
|                              | Bhavanisagar Dam  | 5Km_NW       |
|                              | Bhavani River   | 5Km_N        |
|                              | Kavalaipalayam Lake   | 6.5Km_SE     |
|                              | O dai   | 6.7Km_SE     |
|                              | Thenkarai Kulam   | 9.3Km_SW     |
| Greenbelt Development Plan   | Proposed to plant 1,150 Nos of trees considering 500 Nos of trees/ Ha criteria<br>The plantation will be developed around the project site and nearby village roads |              |
| Proposed Water Requirement   | 2.3 KLD   |              |
| Nearest Habitation           | 550m – SW   |              |
| Nearest Reserve Forest       | Velamundi – 60m – North West  |              |
| Nearest Wild Life Sanctuary  | Sathiyamangalam Tiger Reserve- 8.77km – North West  |              |

Source: Approved Mining & Land Documents.

### 1.3 BRIEF DESCRIPTION OF THE PROJECT

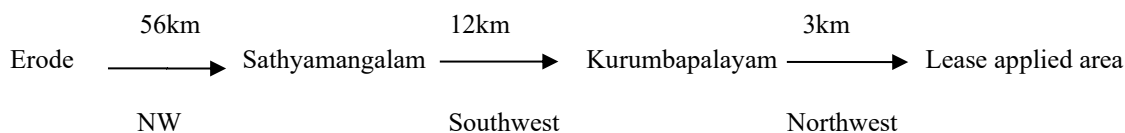
#### 1.3.1 Nature and Size of the Project

The quarrying operation is proposed to be carried out by Opencast Mechanized Mining method with 5.0m bench height and 5.0m bench width by deploying Jack Hammer Drilling & Slurry Explosive during blasting. Hydraulic Excavator and tippers are used for Loading and transportation. Rock Breakers are deployed to avoid secondary blasting.

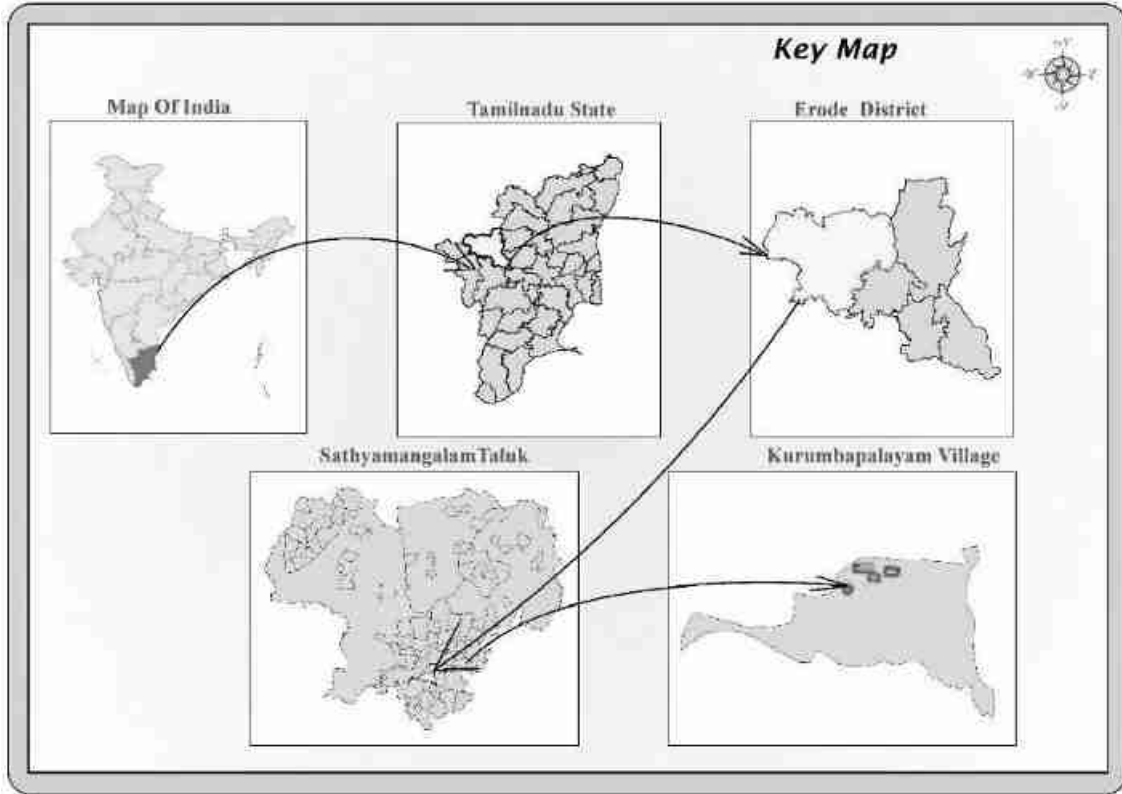
The peak production of Rough stone is 16,820m<sup>3</sup> maximum in a year (56m<sup>3</sup> per day/ 5 Tippers per day considering 12m<sup>3</sup> per load). The depth of the mining is 41m bgl.

#### 1.3.2 Location of the Project

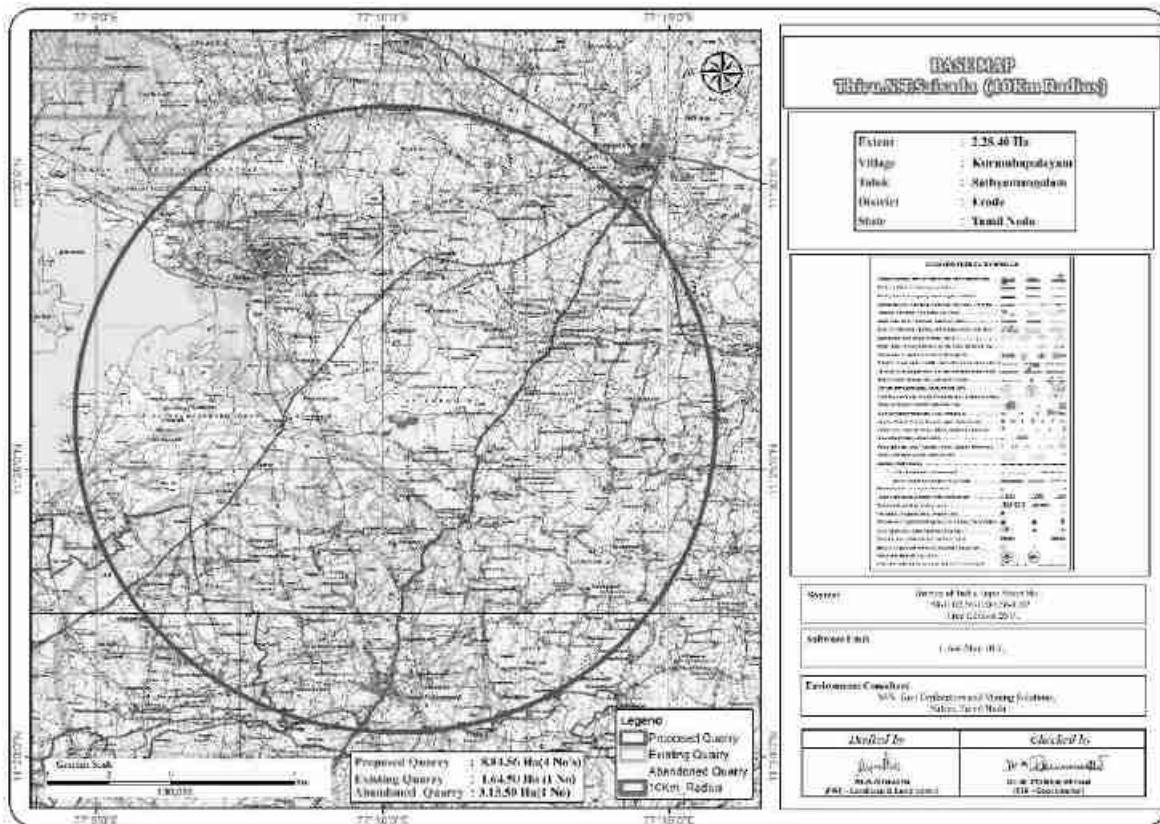
- The project sites located in Kurumbapalayam Village, Sathiyamangalam Taluk, Erode District.
- The lease applied area is located about 62.0km Northwest of Erode, 11 km Southwestern of Sathiyamangalam town and 1.0km Northwestern side of Kurumbapalayam Village.



**FIGURE 1.2 LOCATION MAP OF THE PROJECT SITE**

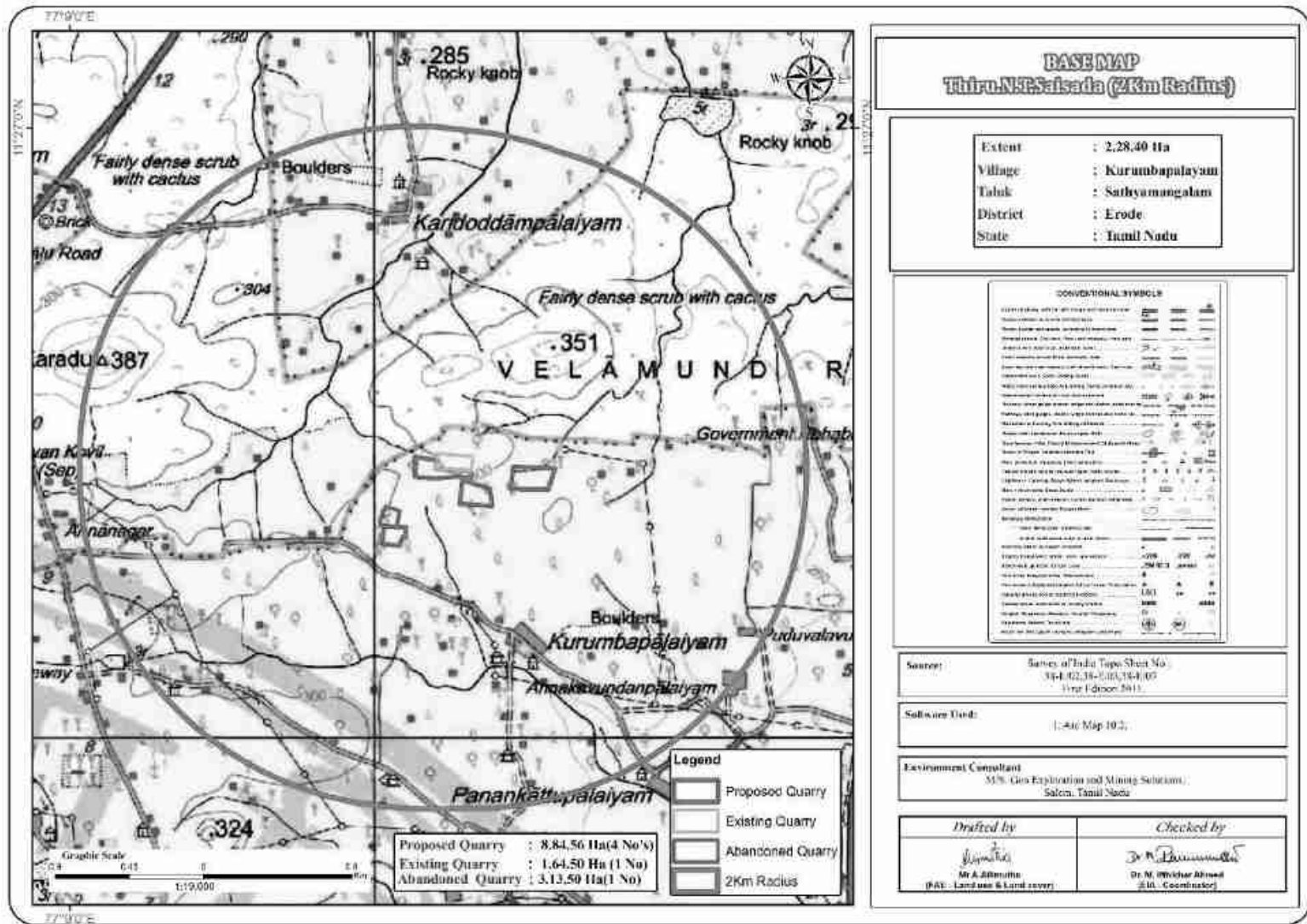


**FIGURE 1.3: TOPOSHEET MAP OF THE STUDY AREA 10 KM RADIUS**



Source: Survey of India Toposheet: 58-E/02, 58-E/03, 58-E/07

FIGURE 1.4: TOPOSHEET MAP OF THE STUDY AREA 2KM RADIUS



## 1.4 ENVIRONMENTAL CLEARANCE

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

- Screening,
- Scoping
- Public consultation &
- Appraisal

### SCREENING

- Proponent applied for Rough stone and Gravel quarry lease on 16.03.2023
- Precise area communication letter was issued by the Deputy Director vide Rc.No. 152/Mines/2023, Dated:12.02.2024
- The Mining plan has been prepared by the Qualified person and got approval vide Letter Rc.No. 152/Mines/2023, Dated:04.03.2024
- The proposed project falls under “B1” Category as per Order Dated: 04.09.2018 & 13.09.2018 passed by Hon'ble National Green tribunal, New Delhi in O.A. No. 173 of 2018 & O.A. No, 186 of 2016 and MoEF& CC Office Memorandum F. No. L-11011/175/2018-IA-II (M) Dated: 12.12.2018
- Proponent applied for ToR for Environmental Clearance vide online Proposal No. SIA/TN/MIN/467395/2024, Dated:02/05/2024.

### SCOPING:

- The proposal was placed in 464<sup>th</sup> SEAC meeting held on 03.05.2024 and the committee recommended for issue of ToR.
- The proposal was considered in 723<sup>rd</sup> SEIAA meeting held on 24.05.2024 and issued ToR vide File No.: 10788 ToR Identification No.: T024B0108TN5906337N Dated: 31.05.2024.

### PUBLIC CONSULTATION

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 is submitted along with this Draft EIA/ EMP Report and the outcome of public hearing proceedings will be detailed in the Final EIA/EMP Report.

### APPRAISAL –

Appraisal is the detailed scrutiny by the State Expert Appraisal Committee (SEAC) of the application and other documents like the final EIA & EMP Report, outcome of the Public Consultations including Public Hearing Proceedings, submitted by the proponent to the regulatory authority concerned for grant of environmental clearance.

## 1.5 TERMS OF REFERENCE (ToR)

The ToR was issued by the SEIAA vide File No.: 10788 ToR Identification No.: T024B0108TN5906337N Dated: 31.05.2024. The Details of the ToR Compliance is given in the Page No.

## 1.6 POST ENVIRONMENT CLEARANCE MONITORING

The proponent shall submit a half-yearly compliance report in respect of stipulated Environmental Clearance terms and conditions to MoEF& CC Regional Office & SEIAA after grant of EC on 1<sup>st</sup> June and 1<sup>st</sup> December of each calendar year as per MoEF& CC Notification S.O. 5845 (E) Dated: 26.11.2018.

## 1.7 GENERIC STRUCTURE OF EIA DOCUMENT

The overall contents of the EIA report follow the list of contents prescribed in the EIA Notification 2006 and the “Environmental Impact Assessment Guidance Manual for Mining of Minerals” published by MoEF& CC.

## 1.8 THE SCOPE OF THE STUDY

The main scope of the EIA study is to quantify the cumulative impact in the study area due to cluster quarries and formulate the effective mitigation measures. 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, Dust generation etc., have been discussed in this report. The baseline monitoring study has been carried out during the Pre monsoon season (March 2024 to May 2024) for various environmental components so as 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.

**TABLE 1.3: ENVIRONMENT ATTRIBUTES**

| Sl.No. | Attributes             | Parameters   | Source and Frequency   |
|--------|------------------------|--|--|
| 1      | Ambient Air Quality    | PM <sub>10</sub> , PM <sub>2.5</sub> , SO <sub>2</sub> , NO <sub>2</sub>     | Continuous 24-hourly samples twice a week for three months at 7 locations (1 Core & 6 Buffer)                      |
| 2      | Meteorology            | Wind speed and direction, temperature, relative humidity and rainfall        | Near project site continuous for three months with hourly recording and from secondary sources of IMD station      |
| 3      | Water quality          | Physical, Chemical and Bacteriological parameters                            | Grab samples were collected at 6 locations – 2 Surface water and 4 Ground water samples; once during study period. |
| 4      | Ecology                | Existing terrestrial and aquatic flora and fauna within 10 km radius circle. | Limited primary survey and secondary data was collected from the Forest department.                                |
| 5      | Noise levels           | Noise levels in dB(A)  | 7 Locations – data monitored once for 24 hours during EIA study  |
| 6      | Soil Characteristics   | Physical and Chemical Parameters   | Once at 6 locations during study period  |
| 7      | Land use               | Existing land use for different categories                                   | Based on Survey of India topographical sheet and satellite imagery and primary survey.                             |
| 8      | Socio-Economic Aspects | Socio-economic and demographic characteristics, worker characteristics       | Based on primary survey and secondary sources data like census of India 2011.                                      |

|    |  |  |  |
|----|--|--|--|
| 9  | Hydrology                                    | Drainage pattern of the area, nature of streams, aquifer characteristics, recharge and discharge areas | Based on data collected from secondary sources as well as hydro-geology study report prepared. |
| 10 | Risk assessment and Disaster Management Plan | Identify areas where disaster can occur by fires and explosions and release of toxic substances        | Based on the findings of Risk analysis done for the risk associated with mining.               |

Source: Field Monitoring Data

### 1.8.1 Regulatory Compliance & Applicable Laws/Regulations for all Proposed Quarries

- Application for Quarrying Lease as per Tamil Nadu Minor Mineral Concession Rules, 1959.
- Obtained Precise Area Communication Letter as per Tamil Nadu Minor Mineral Concession Rules, 1959 for Preparation of Mining Plan and obtaining Environmental Clearance.
- The Mining Plan has been approved under Rule 41 & 42 as amended of Tamil Nadu Minor Mineral Concession Rules, 1959.
- ToR vide File No.: 10788 ToR Identification No.: T024B0108TN5906337N Dated: 31.05.2024.

\*\*\*\*\*

## 2. PROJECT DESCRIPTION

### 2.0 GENERAL

The Proposed Rough Stone and Gravel Quarry requires Environmental Clearance. There are 4 proposed, and 1 existing quarry forming a cluster; calculated as per MoEF& CC Notification S.O. 2269(E) Dated 1<sup>st</sup> July 2016 and the total extent of cluster is 10.49.36 ha.

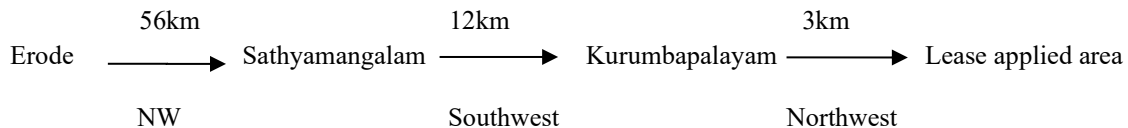
As the extent of cluster are more than 5 ha, the proposal falls under B1 Category as per the Order Dated: 04.09.2018 & 13.09.2018 passed by Hon'ble National Green Tribunal, New Delhi in O.A. No. 173 of 2018 & O.A. No, 186 of 2016 and MoEF& CC Office Memorandum F. No. L-11011/175/2018-IA-II (M) Dated: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

### 2.1 DESCRIPTION OF THE PROJECT

The proposed project is site specific and there is no additional area required for this project. There is no effluent generation/discharge from this project. Method of mining is opencast mechanized method involving splitting of rock mass of considerable volume from the parent rock mass by jackhammer drilling and blasting, hydraulic excavators are used for loading the Rough Stone from pithead to the needy crushers and rock breakers to avoid secondary blasting.

### LOCATION OF THE PROJECT

- The project sites located in Kurumbapalayam Village, Sathyamangalam Taluk, Erode District.
- The lease applied area is located about 62.0km Northwest of Erode, 11 km Southwestern of Sathyamangalam town and 1.0km Northwestern side of Kurumbapalayam Village.



**TABLE 2.1: SITE CONNECTIVITY**

|                         |   |
|-------------------------|---|
| Nearest Roadway         | NH (948)- Coimbatore to Bengaluru Road – 2.6km – SE<br>SH (15A) - Sathyamangalam – Mettupalayam (SH – 15) – 2.7 km – North West |
| Nearest Village         | Kurumbapalayam – 560m – South West  |
| Nearest Town            | Sathyamangalam – 11.0 km - North East   |
| Nearest Railway Station | Mettupalayam Railway station - 29.0 km – South West   |
| Nearest Airport         | Coimbatore – 46.5km – SW  |
| Seaport                 | Kochi – 189.km – SW   |

Source: Survey of India Toposheet

**TABLE 2.2: CO-ORDINATES– PROJECT BOUNDARY**

| Corner Nos. | Latitude      | Longitude     |
|-------------|---------------|---------------|
| 1           | 11°25'51.69"N | 77°10'07.91"E |
| 2           | 11°25'54.94"N | 77°10'07.85"E |
| 3           | 11°25'55.19"N | 77°10'07.83"E |



|  |                |               |
|--|----------------|---------------|
| 4                                      | 11°25'54.68"N  | 77°10'12.11"E |
| 5                                      | 11°25'53.31"N  | 77°10'11.98"E |
| 6                                      | 11°25'52.86"N  | 77°10'18.95"E |
| 7                                      | 11°25'51.50"N  | 77°10'18.78"E |
| 8                                      | 11°25'51.75"N  | 77°10'15.99"E |
| 9                                      | 11°25'51.66"N  | 77°10'15.60 E |
| 10                                     | 11° 25'51.53"N | 77°10'13.46"E |
| 11                                     | 11°25'51.36"N  | 77°10'11.78"E |
| <b>Datum: UTM-WGS84, Zone 43 North</b> |                |               |

Source: Approved Mining Plan

**FIGURE 2.1: TOPOGRAPHICAL VIEW OF PROJECT AREA**



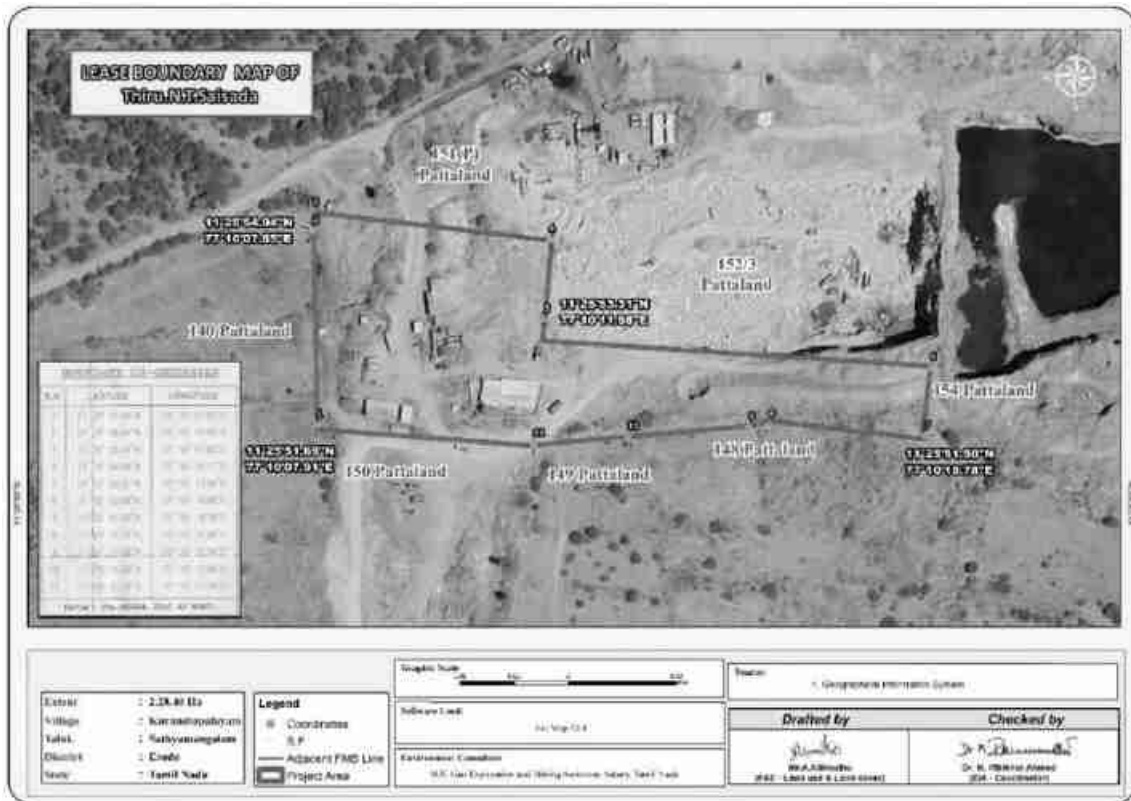


**Mine Lease Fencing Photographs**



**Green Belt Photographs**

**FIGURE 2.2: GOOGLE IMAGE OF THE PROJECT AREA**



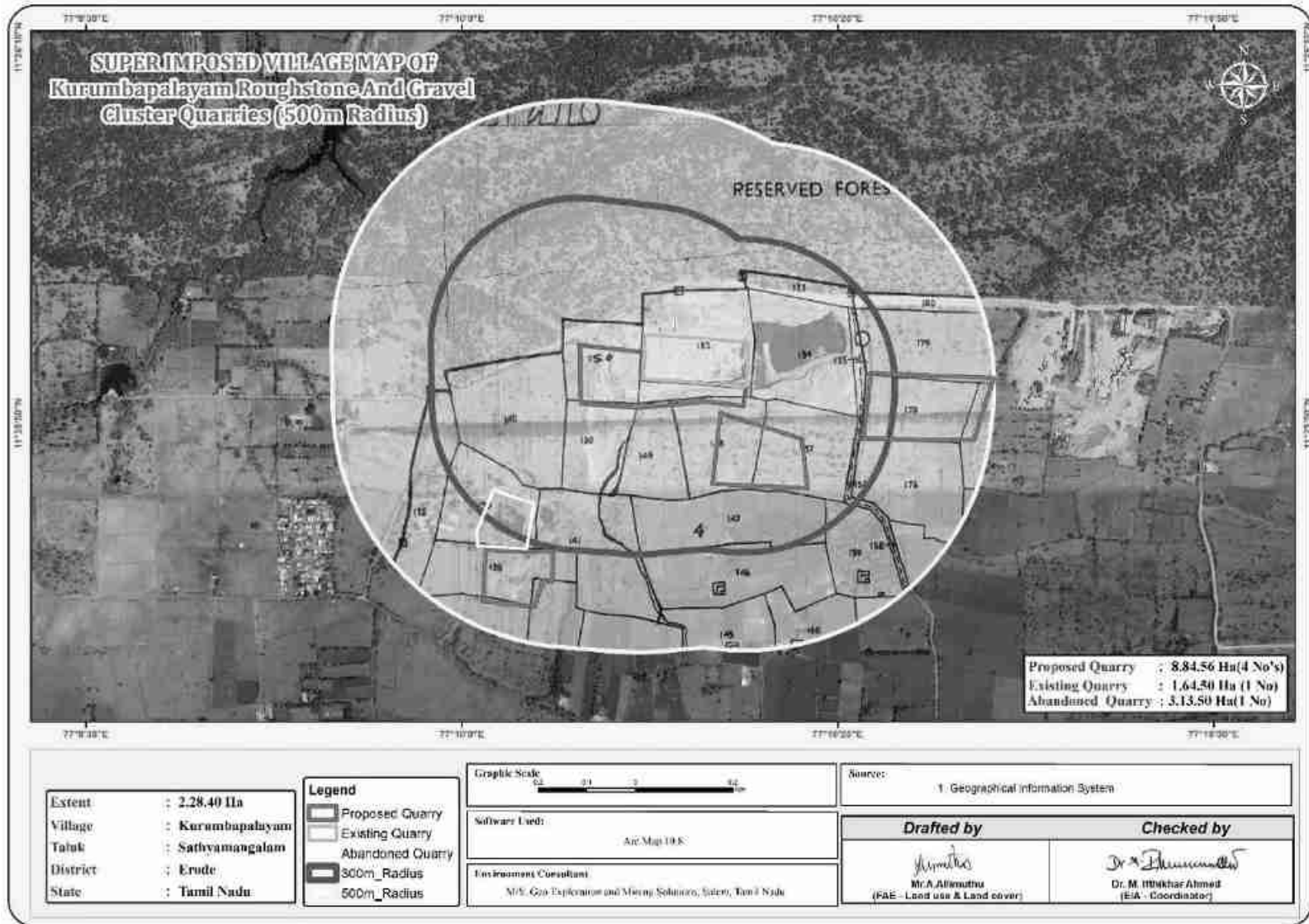
Source: Google Earth Imagery

**FIGURE 2.3: QUARRY LEASE PLAN / SURFACE PLAN**

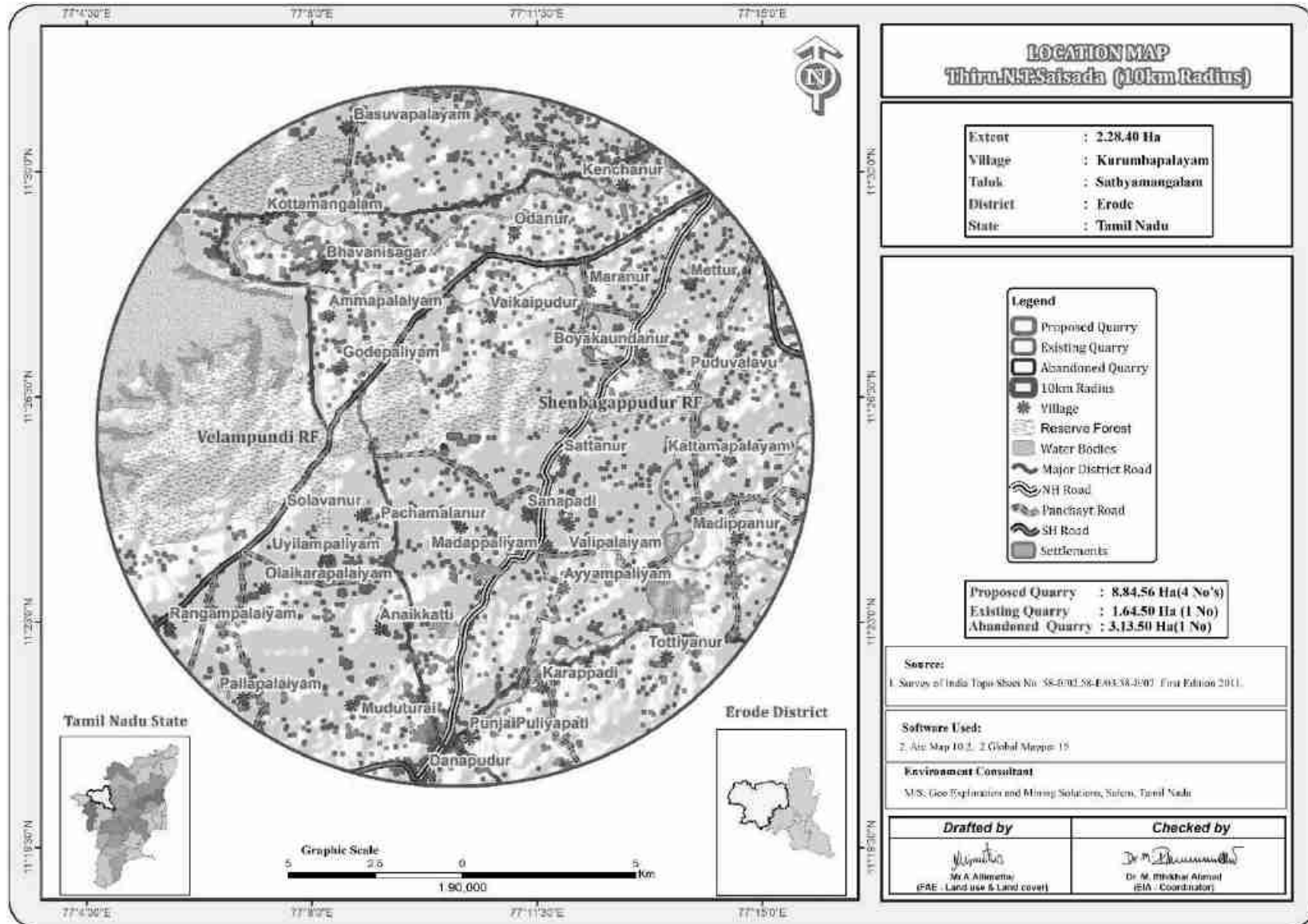


Source: Approved Mining Plan

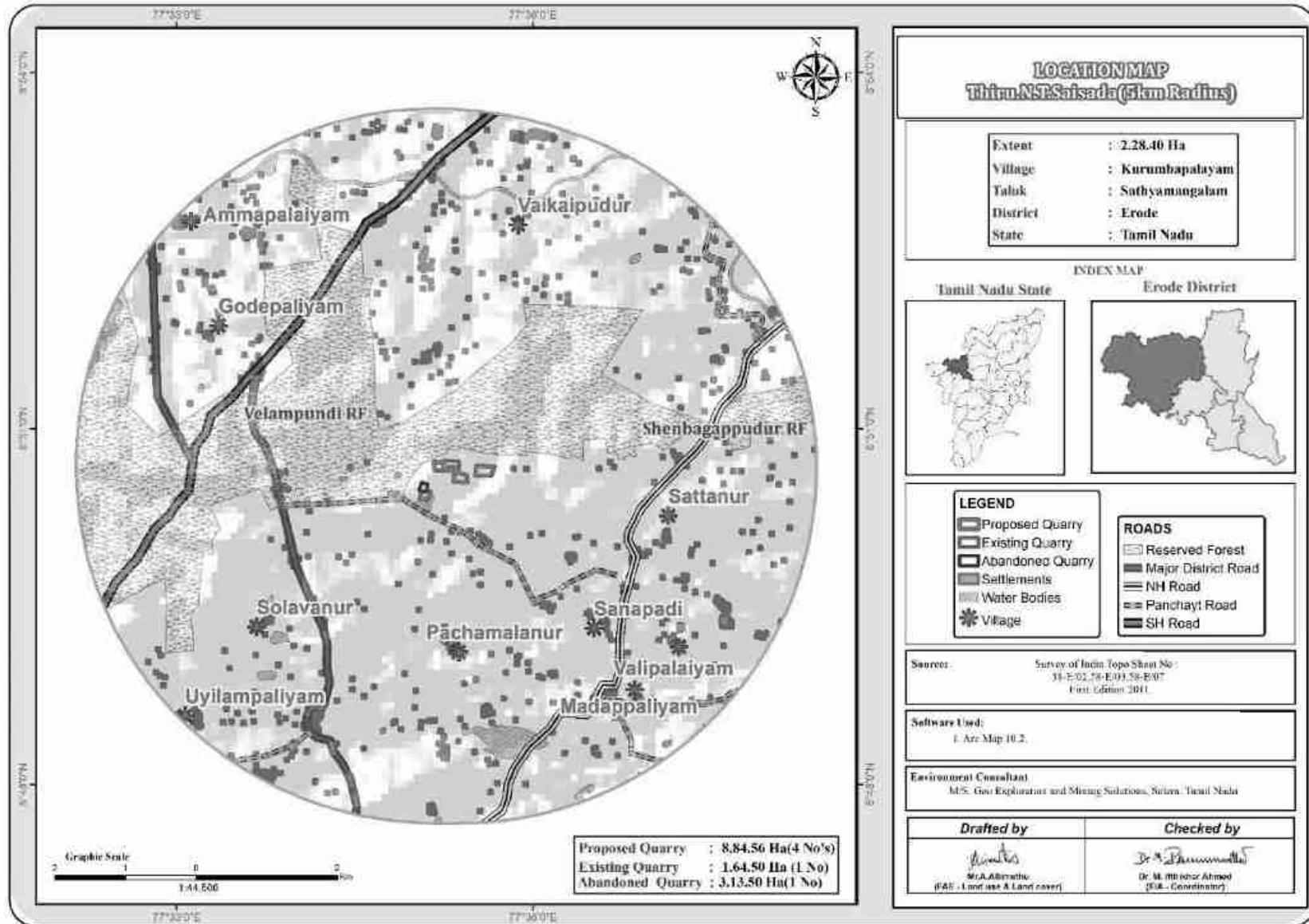
**FIGURE 2.4: VILLAGE MAP SUPERIMPOSED ON GOOGLE EARTH IMAGE**



**FIGURE 2.5: IMAGE SHOWING SURFACE FEATURES AROUND 10 KM RADIUS**



**FIGURE 2.6: IMAGE SHOWING SURFACE FEATURES AROUND 5 KM RADIUS**



### 2.2.1 Project Area

- The project is site specific & no beneficiation or processing in the project site.
- There is no forest land involved in the proposed projects and is devoid of major vegetation and trees.

**TABLE 2.3: LAND USE PATTERN**

| Description          | Present area (Ha) | Area required during the first five year (Ha) | Area at the end of Lease period (Ha) |
|----------------------|-------------------|---|--------------------------------------|
| Area Under Quarrying | Nil               | 1.62.48                                       | 1.62.48                              |
| Infrastructure       | Nil               | 0.01.00                                       | 0.01.00                              |
| Roads                | Nil               | 0.02.00                                       | 0.02.00                              |
| Green Belt           | Nil               | 0.35.93                                       | 0.59.65                              |
| Unutilized Area      | 2.28.40           | 0.26.99                                       | 0.03.27                              |
| <b>Grand Total</b>   | <b>2.28.40</b>    | <b>2.28.40</b>                                | <b>2.28.40</b>                       |

Source: Approved Mining Plan

**TABLE 2.4: RESOURCES AND RESERVES**

| PARTICULARS                   | DETAILS                       |                                  |                          |
|-------------------------------|-------------------------------|----------------------------------|--------------------------|
|                               | Rough Stone in m <sup>3</sup> | Weathered Rock in m <sup>3</sup> | Gravel in m <sup>3</sup> |
| Geological Resources          | 6,85,200                      | 2,28,400                         | 22,840                   |
| Mineable Reserves             | 1,45,660                      | 1,35,030                         | 15,582                   |
| Year wise Production          | 1,45,660                      | 1,35,030                         | 15,582                   |
| Peak Production               | 16,820                        | 49,000                           | 5,270                    |
| Mining / Lease Applied Period | 10 Years                      |                                  |                          |
| Number of Working Days        | 300 Days                      |                                  |                          |
| Production per day            | 56                            | 163                              | 18                       |
| No of Lorry loads             | 5                             | 14                               | 2                        |
| Total Depth of Mining         | 41m BGL                       |                                  |                          |

Source: Approved mining plan.

## GEOLOGY

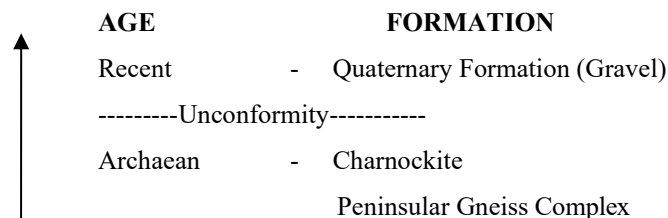
### 2.3.1 Regional Geology

The major part of the district is covered by metamorphosed crystalline rocks of the Charnockite Group and the Migmatite Complex of Archaean age. The area where the Charnockite Group of rocks is spread over comprises charnockite, pyroxene granulite, magnetite quartzites and younger basic dykes intruding into them.

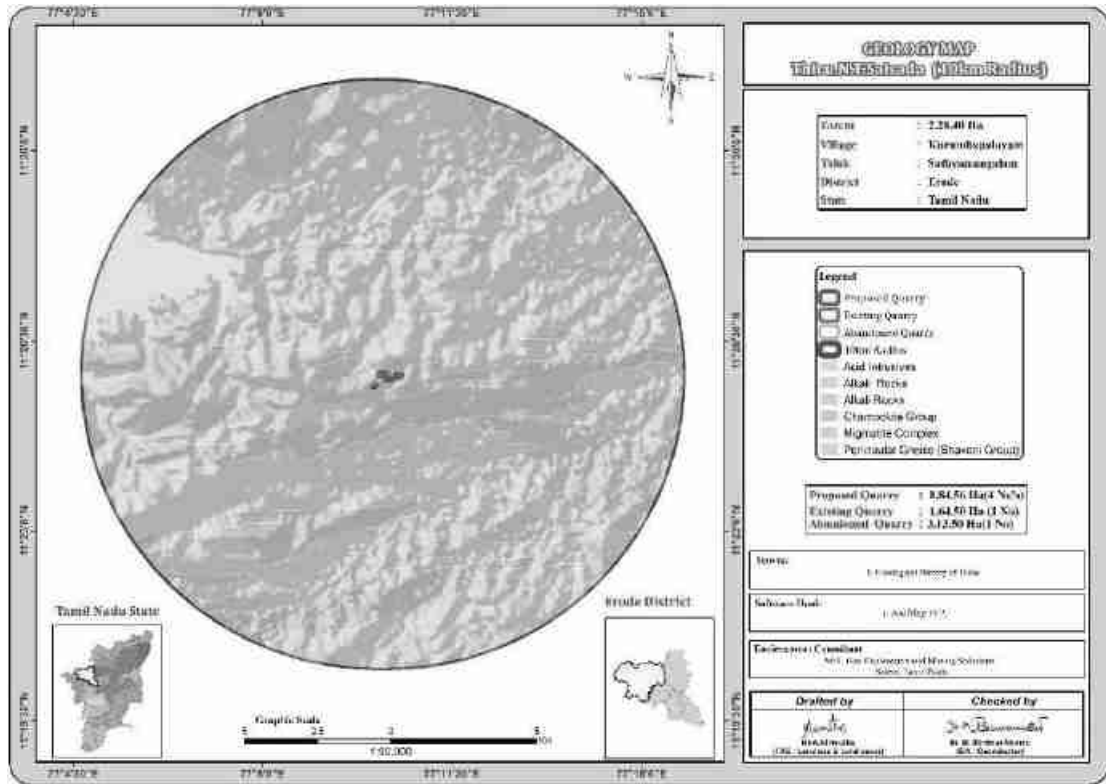
**The Migmatite Complex** comprising biotite gneisses, agmatitic gneisses, sub-augen gneiss, quartzo feldspathic gneisses and gneissic granites with pink permeation

Peninsular gneiss forms the oldest rock formations, in which the massive formation of Charnockite lies over with rich accumulation of recent quaternary formation. On regional scale of the Charnockite body is N30°E – S30°W with dipping towards SE60°.

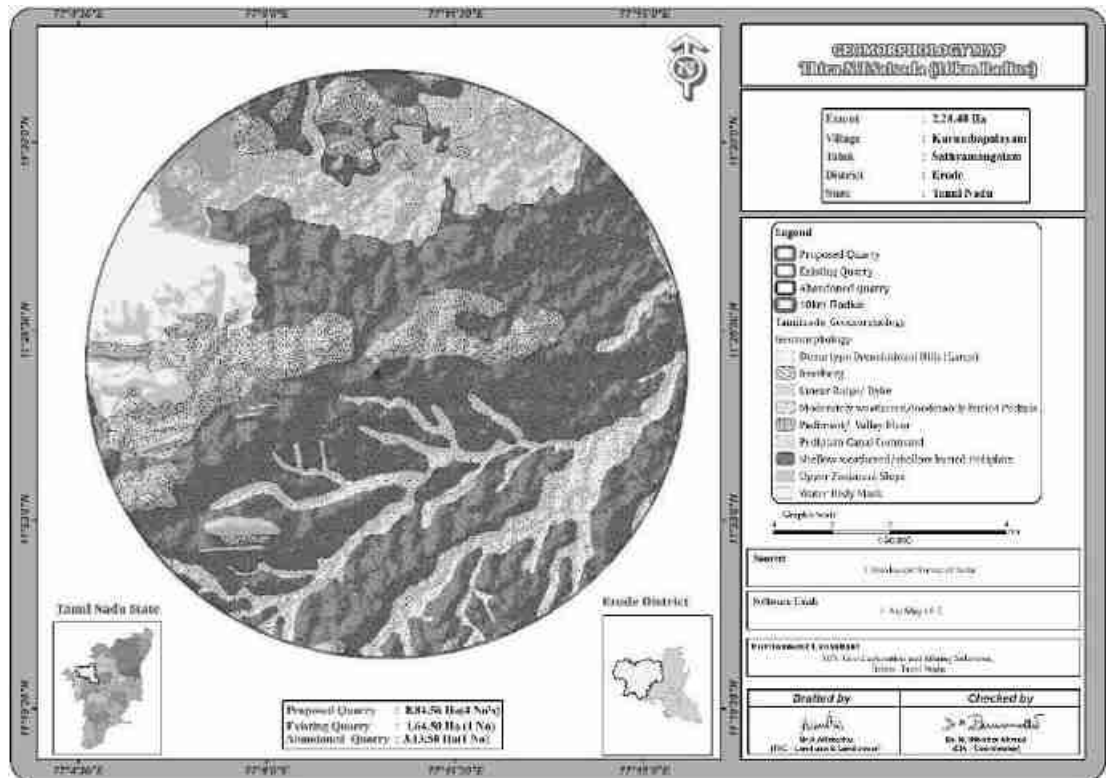
The general geological sequences of the rocks in this area are given below:



**FIGURE 2.7: REGIONAL GEOLOGY MAP**



**FIGURE 2.8: GEOMORPHOLOGY MAP**





## 2.4 RESOURCES AND RESERVES

The Resources and Reserves of Rough Stone and Gravel were calculated based on Cross-Section Method by plotting sections to cover the maximum lease area. Based on the availability of Geological Resources the Mineable Reserves are calculated by considering excavation system of bench formation and leaving essential safety distance of 7.5 m (Safety Barrier all around the applied area) and safety distance as per precise area communication letter and deducting the locked up reserves during bench formation (Also called as Bench Loss) and the Mineable Reserves is calculated considering there is no waste / overburden / side burden (100% Recovery Anticipated).

**TABLE 2.5: RESOURCES AND RESERVES**

| Description                                   | Rough Stone in m <sup>3</sup> | Weathered Rock in m <sup>3</sup> | Gravel in m <sup>3</sup> |
|---|-------------------------------|----------------------------------|--------------------------|
| Geological Resource in m <sup>3</sup>         | 6,85,200                      | 2,28,400                         | 22,840                   |
| Mineable Resource in m <sup>3</sup>           | 1,45,660                      | 1,35,030                         | 15,582                   |
| Year wise production for Ten-year plan period | 1,45,660                      | 1,35,030                         | 15,582                   |

Source: Approved Mining Plan

**TABLE 2.6: YEAR-WISE PRODUCTION PLAN**

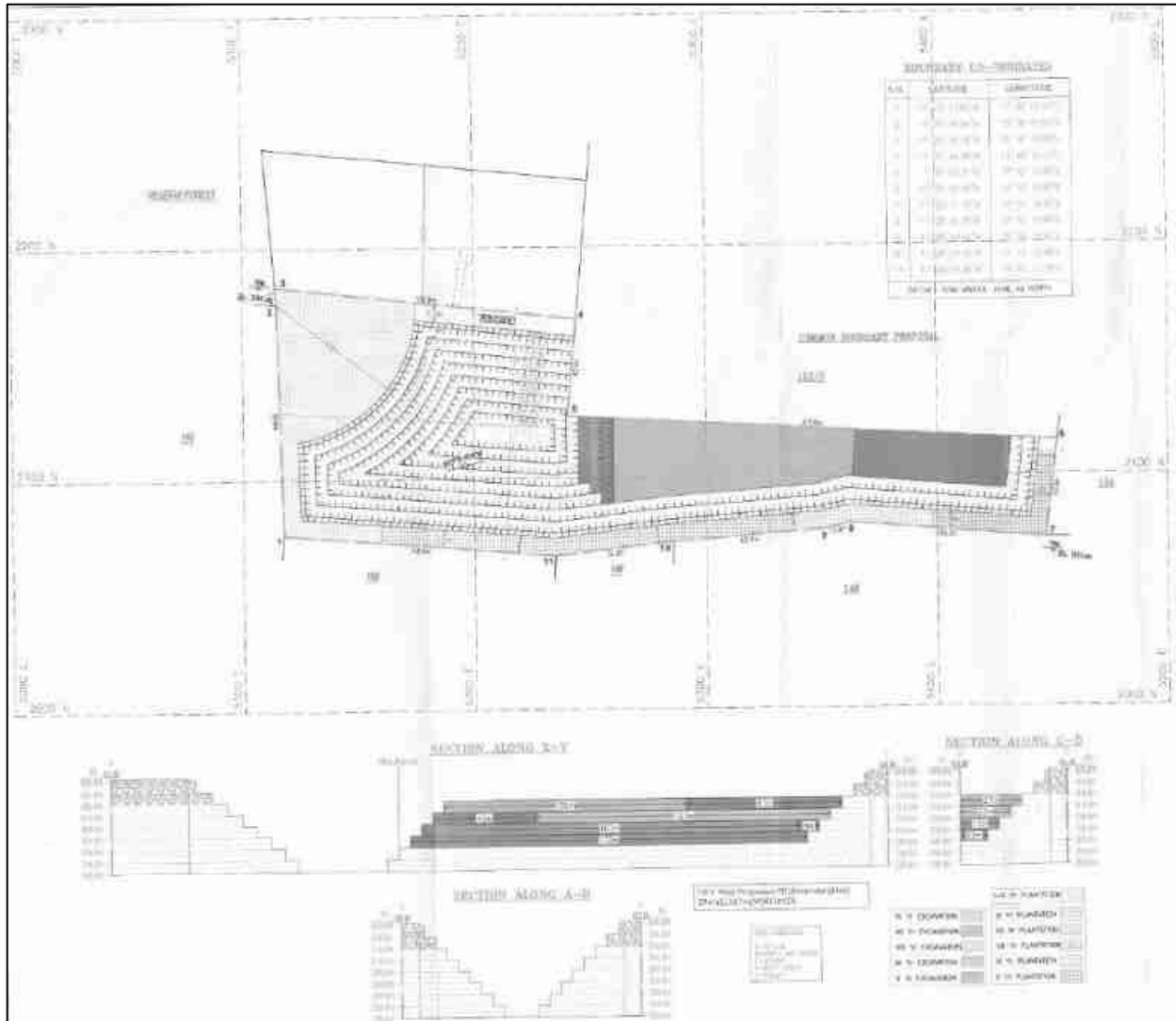
| YEAR           | Rough Stone in m <sup>3</sup> | Weathered Rock in m <sup>3</sup> | Gravel in m <sup>3</sup> |
|----------------|-------------------------------|----------------------------------|--------------------------|
| I              | 15910                         | 39800                            | 5220                     |
| II             | 16520                         | 49000                            | 5270                     |
| III            | 16190                         | 46230                            | 5092                     |
| IV             | 16820                         | -                                | -                        |
| V              | 15090                         | -                                | -                        |
| <b>TOTAL</b>   | <b>80530</b>                  | <b>1,35,030</b>                  | <b>15,582</b>            |
| VI             | 13500                         | -                                | -                        |
| VII            | 13445                         | -                                | -                        |
| VIII           | 13970                         | -                                | -                        |
| IX             | 13430                         | -                                | -                        |
| X              | 10785                         | -                                | -                        |
| <b>TOTAL</b>   | <b>65130</b>                  | -                                | -                        |
| <b>G.TOTAL</b> | <b>1,45,660</b>               | <b>1,35,030</b>                  | <b>15,582</b>            |

Source: Approved Mining Plan

### Disposal of Waste

The overburden in the form of Gravel is **15,582m<sup>3</sup>** up to depth 1m and Weathered Rock formation is **1,35,030m<sup>3</sup>** up to depth 10m for first three years. The Gravel and Weathered Rock will be directly loaded into Tippers for the filling and levelling of low-lying areas, this will be done only after obtaining permission and paying necessary seigniorage fee to the Government. The excavated rough stone will be directly loaded into Tippers to the needy customers.

**FIGURE 2.9: TOPOGRAPHY, GEOLOGICAL, YEAR-WISE DEVELOPMENT PRODUCTION PLAN AND SECTIONS**



Source: Approved Mining Plan

**Conceptual Mining Plan/ Final Mine Closure Plan**

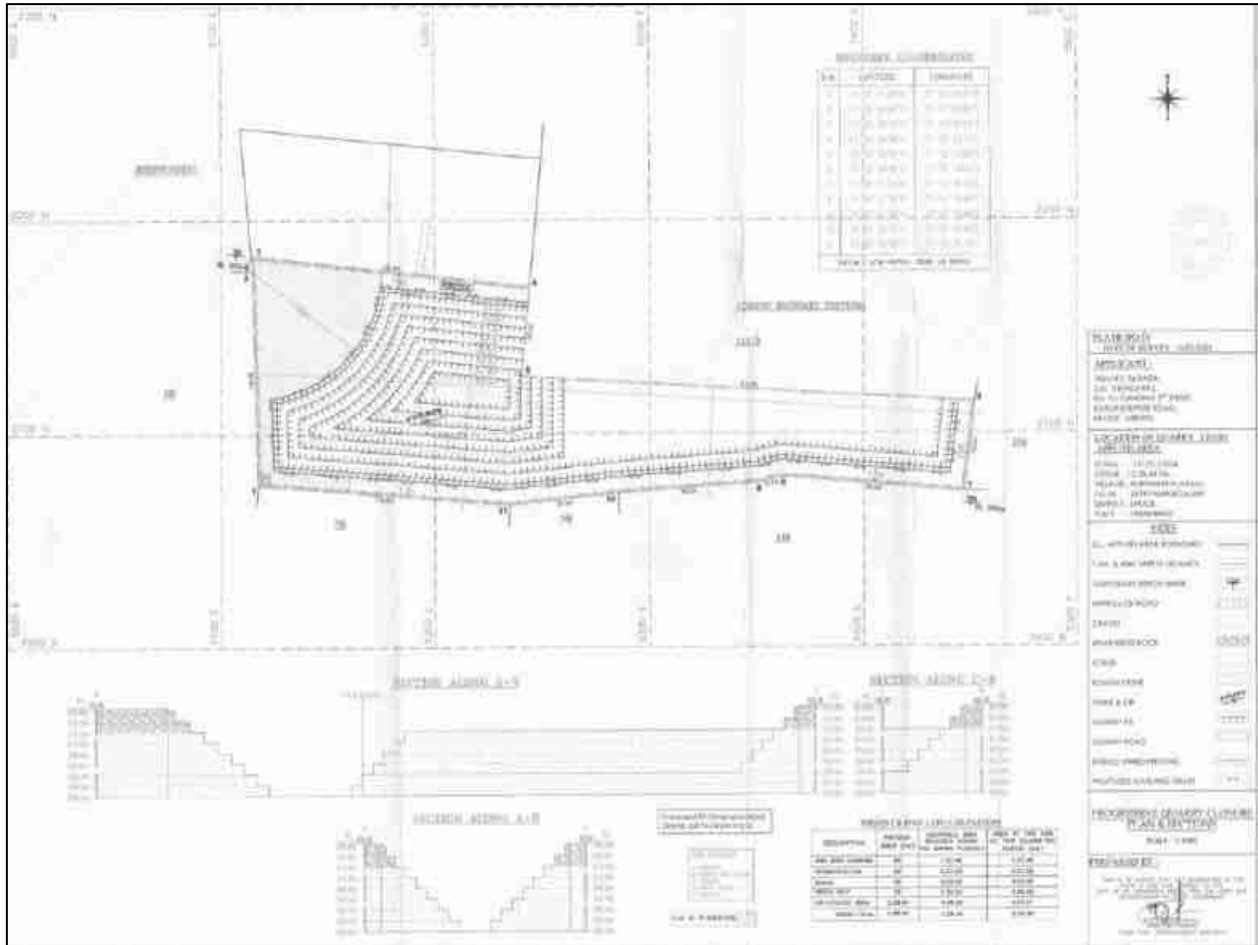
The ultimate pit size is designed based on certain practical parameters such as economical depth of mining, safety zones, permissible area, etc.

**TABLE 2.7: ULTIMATE PIT DIMENSION**

| Pit | Length (Max) (m) | Width (Max) (m) | Depth (Max) |
|-----|------------------|-----------------|-------------|
| I   | 294              | 87              | 41m bgl     |

Source: Approved Mining Plan

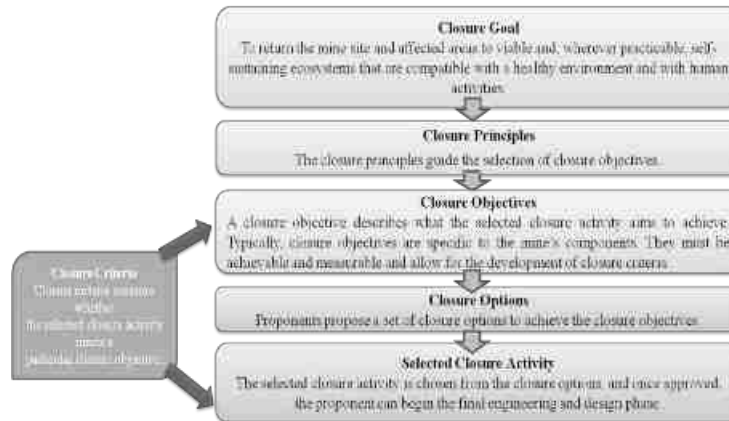
**FIGURE 2.10: CLOSURE PLAN AND SECTIONS**



Source: Approved Mining Plan

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

## Closure Objectives –



- Access to be limited, for the safety of humans and wildlife.
- The open pit mine workings and pit boundary are physically and geo-technically stable.
- Water quality in flooded pits is safe for humans, aquatic life, and wildlife.
- Discharge of contaminated drainage has been minimized and controlled.
- Original or desired new surface drainage patterns have been established.
- For flooded pits, in-pit aquatic habitat has been established where practical and feasible.
- Emergency access and escape routes from flooded pits for humans and wildlife are in place.
- Dust levels are safe for people, vegetation, aquatic life, and wildlife.

## Closure Planning & Options Considerations in Mine Design –

- The closure of mine is well planned at the initial stage of planning & design consideration by the internal and external stake holders
- Construction of 2m height bund all along the mine pit boundary and ensure its stability all time & construction of garland drain along the natural slope to avoid sliding and collection of soil to the pit & surface runoff during rainfall
- After complete exploitation of mineral, the lowest bench foot wall side will be maintained as plain surface without any sump pits to avoid any accidents
- All the sharp edges will be dressed to smoother face before the closure of mine and ensure no loose debris on hanging wall side
- The project proponent as a part of social responsibilities assures to supply the stored mine pit water to the nearby villages after effective treatment process as per the standards of TNPCB & TWAD
- Native species will be planted in 3 row patterns on the boundary barriers and 1<sup>st</sup> bench, a full-time sentry will be appointed at the gate to prevent inherent entry of public & cattle.
- The access road to the quarry will be cut-off immediately after the closure
- The layout design shall be prepared and get approved from Department of Geology and Mining.
- The proponent is instructed to construct as per the layout approved
- Physical and chemical stability of structures left in place at the site, the natural rehabilitation of a biologically diverse, stable environment, the ultimate land use is optimized and is compatible with the surrounding area and the requirements of the local community, and taking the needs of the local community into account and minimizing the socio-economic impact of closure
- There will be a positive change in the environmental and ecology due to the mine closure

## 2.5 METHOD OF MINING

Opencast Mechanized Mining Method is proposed by formation of 5.0-meter height bench with a bench width not less than the bench height. Bench slope will be maintained as 60°.

The Rough Stone is a batholith formation and the splitting of rock mass of considerable volume from the parent rock mass will be carried out by deploying jackhammer drilling and Slurry Explosives will be used for blasting. Hydraulic Excavator attached with rock breaker/ bucket with tipper combination will be involved for the excavation/breaking of rough stone after blasting. Hydraulic excavators attached with bucket unit will be deployed for loading the Rough Stone into the tippers and then the stone is transported from pithead to the nearby crushers.

It is recommended to obtain necessary statutory permission from the Department of Geology and Mining for Using Heavy Earth Moving Machineries, Blasting and appointment of Mines Manager etc.,

### 2.5.1 Drilling & Blasting Parameters

Drilling will be carried out using Jack hammer and compressor, the depth of the hole will be maximum 1.5m. Drilling & Blasting will be carried out as per parameters given below: -

|                          |   |   |
|--------------------------|---|---|
| Spacing                  | – | 1.2m  |
| Burden                   | – | 1.0 m   |
| Depth of hole            | – | 1.5 m   |
| Charge per hole          | – | 0.50 – 0.75kg   |
| Powder factor            | – | 6.0 tonnes/kg   |
| Diameter of hole         | – | 32 mm   |
| Production Capacity      | = | 205m <sup>3</sup> of Rough stone per day                |
| Spacing X Burden X Depth | = | 1.2m X 1.0m X 1.5m = 1.8m <sup>3</sup>                  |
|                          | = | 1.8m <sup>3</sup> X 2.6 (Bulk Density) = 4.6Ts per hole |

hence for the production of 236m<sup>3</sup> (616Ts) = 103 Nos of holes to be drilled per day

Explosives per hole = ½ kg hence 52 kg of Explosives will be utilized maximum considering the peak production

**Type of Explosives to be used –**

Slurry explosives (An explosive material containing substantial portions of a liquid, oxidizers, and fuel, plus a thickener), NONEL / Electric Detonator & Detonating Fuse.

**Storage of Explosives**

No proposal for storage of explosives within the project area, the project proponent will made agreement with authorized explosives agencies for carrying out blasting activities and competent person as per DGMS guidelines will be employed for safety and supervision of overall quarrying activities.

The explosives will be sourced from the blasting agency on daily basis and the blasting will be carried out under the supervision of competent qualified Blaster and it will be ensured that there shall be no balance of explosive stock; any balance stock will be taken back by the supplier.

**2.5.2 Extent of Mechanization****TABLE 2.8: PROPOSED MACHINERY DEPLOYMENT**

| S.NO. | TYPE                                   | NOS | SIZE/CAPACITY | MOTIVE POWER   |
|-------|--|-----|---------------|----------------|
| 1     | Jack hammer                            | 4   | 1.2m to 2.0m  | Compressed air |
| 2     | Compressor                             | 1   | 400psi        | Diesel Drive   |
| 3     | Excavator with Bucket and Rock Breaker | 1   | 300 HP        | Diesel Drive   |
| 4     | Tipper                                 | 3   | 20 Tonnes     | Diesel Drive   |
| 5     | Water Sprinkler                        | 1   | 4000 ltrs     | Diesel Drive   |

Source: Approved Mining Plan

**2.6 GENERAL FEATURES****2.6.1 Existing Infrastructures**

Infrastructures like Mine office, Temporary Rest shelters for workers, Latrine and Urinal Facilities will be constructed as per the Mine Rule after the grant of quarry lease in all the proposed quarries.

**2.6.2 Drainage Pattern**

There are no streams, canals or water bodies crossing within the project area. The drainage pattern of the area is dendritic – sub dendritic.

**2.6.3 Traffic Density**

The traffic survey conducted based on the transportation route of material, the Rough Stone is proposed to be transported mainly through

Traffic density measurements were performed at two locations

1. Village Road\_Kurumbalayam Road
2. National Highway\_Sanarpatti to Vinnampalli Road

Traffic density measurement was 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.

**TABLE.2.9: TRAFFIC SURVEY LOCATIONS**

| Station Code | Road Name                                       | Distance and Direction | Type of Road |
|--------------|---|------------------------|--------------|
| TS1          | Village Road_Kurumbalayam Road                  | 2.5km_SE               | Village Road |
| TS2          | National Highway_Sanarpatti to Vinnampalli Road | 3.6km_NE               | NH Road      |

Source: On-site monitoring by GEMS FAE & TM

**TABLE 2.10: EXISTING TRAFFIC VOLUME**

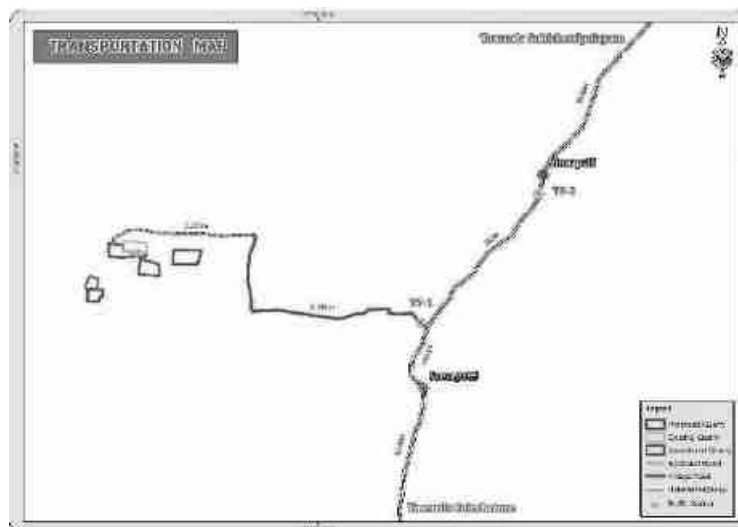
| Station code | HMV |     | LMV |     | 2/3 Wheelers |     | Total PCU |
|--------------|-----|-----|-----|-----|--------------|-----|-----------|
|              | No  | PCU | No  | PCU | No           | PCU |           |
| TS1          | 150 | 450 | 90  | 90  | 160          | 80  | 620       |
| TS2          | 250 | 750 | 150 | 150 | 250          | 125 | 1025      |

Source: On-site monitoring by GEMS FAE & TM

\* PCU conversion factor: HMV (Trucks and Bus) = 3, LMV (Car, Jeep and Auto) = 1 and 2/3 Wheelers = 0.5

**TABLE 2.11: ROUGH STONE& GRAVEL HOURLY TRANSPORTATION REQUIREMENT**

| Transportation of Rough Stone & Gravel per day |                     |               |
|--|---------------------|---------------|
| Capacity of trucks                             | No.of Trips per day | Volume in PCU |
| 20 tonnes                                      | 21                  | 63            |

**FIGURE.2.11: MINERAL TRANSPORTATION ROUTE MAP****Proposed Transportation Route:**

1. Existing approach road is located on the East side connecting village road (Total Stretch of the approach road = 1.3km).
2. Kurumbalayam Road (Village Road) connecting the Sanarpatti to Vinnampalli Road (National Highway-948) at a distance of 2.4km.
3. The total Stretch of the Transportation route is about 3.7km from the project site
4. No Major Habitation, Schools in the proposed transportation route.

**TABLE 2.12: 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 Kurumbalayam Road                   | 620                            | 63                                     | 683                  | 1500  |
| National Highway_ Sanarpatti to Vinnampalli Road | 1025                           | 63                                     | 1088                 | 1200  |

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

- Due to these projects the existing traffic volume will not exceed
- 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.

#### 2.6.4 Mineral Beneficiation and Processing

There is no proposal for the mineral processing or ore beneficiation in any of the proposed project.

### 2.7 PROJECT REQUIREMENT

#### 2.7.1 Water Source & Requirement

Detail of water requirements in KLD as given below:

**TABLE 2.13: WATER REQUIREMENT FOR THE PROJECT**

| Purpose               | Quantity      | Source   |
|-----------------------|---------------|--|
| Dust Suppression      | 0.8KLD        | From the existing pit or from the water vendors  |
| Green Belt            | 0.9KLD        | From the existing pit or from the water vendors  |
| Sanitation & Drinking | 0.6KLD        | From the existing pit or from the water vendors. |
| Total                 | <b>2.3KLD</b> |  |

Source: Prefeasibility report

#### 2.7.2 Power and Other Infrastructure Requirement

Power is not required for the mining operation; the mining operation will be carried out using Diesel Generator and Earth moving machineries using diesel. The quarrying activity is proposed during day time only (General Shift 8 AM – 5 PM, Lunch Break 1 PM – 2 PM). Electricity for use in office and other internal infrastructure will be obtained from TNEB by project proponent.

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

#### 2.7.3 Fuel Requirement

One Excavator will excavate 25m<sup>3</sup> of Broken up Rough stone per hour and 60m<sup>3</sup> of Weathered rock and Gravel per hour.

|   |                     |
|---|---------------------|
| Production of Rough stone                               | = 56m <sup>3</sup>  |
| Production of Weathered rock                            | = 163m <sup>3</sup> |
| Production of Gravel                                    | = 18m <sup>3</sup>  |
| Production for the overburden (Gravel + Weathered rock) | = 181m <sup>3</sup> |

| Type of machinery | Working hours | Average Diesel consumption/ Hour | Quantity of Diesel in Ltrs |
|-------------------|---------------|----------------------------------|----------------------------|
|                   |               |                                  |                            |



|                                      |   |         |            |
|--------------------------------------|---|---------|------------|
| Working hours of Excavator (Aprx)    | 56m <sup>3</sup> /25m <sup>3</sup> = 2 Hrs<br>(Rough stone) | 18 Ltrs | 36         |
|                                      | 181/60m <sup>3</sup> = 3 Hrs<br>(Gravel + Weathered rock)   | 18 Ltrs | 54         |
| Compressor                           | Working hours per day 3 Hrs                                 | 8 Ltrs  | 24         |
| Tipplers, Motor pumps to drain water | Occasionally  |         | 20         |
| <b>Total Diesel Consumption</b>      |   |         | <b>134</b> |

The Maximum diesel consumption is around 134 Ltrs per day considering the peak production.

#### 2.7.4 Project Cost

The Environmental Management plan has been prepared considering the mode of working, Safety of the employees and Monitoring periods the total Cost is 84.20 Lakhs.

#### 2.8 EMPLOYMENT REQUIREMENT:

The following manpower's are proposed in the mining plan to carry out the day-to-day quarrying activities, the same employment is maintaining aimed at the proposed production target and also to comply with the statutory provisions of the Metalliferous mine's regulations, 1961.

**TABLE 2.14: PROPOSED MANPOWER DEPLOYMENT**

| Designation                 | No of persons |
|-----------------------------|---------------|
| Geologist                   | 1             |
| Mines Manager/Mines Foreman | 1             |
| Mate/Blaster                | 1             |
| Jack hammer operator        | 8             |
| Excavator Operator          | 1             |
| Tipper driver               | 3             |
| Water sprinkler Driver      | 1             |
| Labour & Helper             | 4             |
| Cleaner & Co-operator       | 2             |
| Security                    | 5             |
| <b>Total</b>                | <b>27</b>     |

Source: Approved Mining Plan & Pre-Feasibility report.

#### 2.9 PROJECT IMPLEMENTATION SCHEDULE

The mining operation will commence after the grant of Environmental Clearance, Consent to operate (CTO), Execution of Lease Deed and Obtaining permission from the DGMS (Notice of Opening).

**TABLE 2.15: EXPECTED TIME SCHEDULE**

| Sl.No.   | Particulars             | Time Schedule (In Month) |                 |                 |                 |                 | 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 Operate      |                          |                 |                 |                 |                 |                |
| 3  | Execution of Lease deed |                          |                 |                 |                 |                 |                |
| 4  | Permission from DGMS    |                          |                 |                 |                 |                 |                |
| Time line may vary; subjected to rules and regulations /& other unforeseen circumstances |                         |                          |                 |                 |                 |                 |                |

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

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### 3. DESCRIPTION OF ENVIRONMENT

#### 3.0 GENERAL

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 to May 2024** with CPCB guidelines for the following attributes –

- Land
- Water
- Air
- Noise
- Biological
- Socio-economic status

Environmental data has been collected with reference to cluster quarries by EHS 360 Labs Private Limited

#### Study Area

An area of 10 km radius (aerial distance) from the periphery of the cluster is considered for EIA study. The study area has been divided into two zones viz **core zone** and **buffer zone**.

- Core zone is considered as cluster area
- Buffer zone taken as 10km radius from the periphery of the Cluster. Both Core zone and Buffer zone is taken as the study area.

#### Study Period

The baseline study was conducted during the Post monsoon season i.e., **March to May 2024**

#### Study Methodology

- The project area was surveyed in detail with the help of Total Station Survey instruments and pillars were marked. The boundary coordinates were superimposed on the satellite imagery to understand the relief of the area, besides Land use pattern of the area was studied through the Bhuvan (ISRO)
  - Soil samples were collected and analysed for relevant physio-chemical characteristics in order to assess the impact due to mining activities and to recommend saplings for Greenbelt development.
  - Ground water samples were collected from the existing bore wells, Surface water was collected from water bodies in the buffer zone and analysed as per CPCB Guidelines.
  - An onsite meteorological station was setup in cluster area, to collect data about wind speed, wind direction, temperature, relative humidity, rainfall and general weather conditions were recorded throughout the study period.
  - Air quality Data were collected by installation of Respiratory Dust Samplers (RDS) for Fugitive dust, PM<sub>10</sub> and SO<sub>2</sub>, NO<sub>x</sub> with gaseous attachments & Fine Dust Samplers (FDS) for PM<sub>2.5</sub> and other parameters as per NAAQ norms and analysed for primary air pollutants to work out the existing status of air quality.
  - The Noise level measurements were also made at various locations in different intervals of time with the help of sound level meter to establish the baseline noise levels in the impact zone.
  - Baseline biological studies were carried out to assess the ecology of the study area to study the existing flora and fauna pattern of the area.
-

• Socio-Economic survey was conducted at village and household level in the study area to understand the present socio-economic conditions and assess the extent of impact due to the proposed mining project. The sampling methodologies for the various environmental parameters required for the study, frequency of sampling, method of samples analysis, etc., are given below 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 10 km radius of the study area  | Data's from census handbook 2011 and from the satellite imagery       | Study Area                           | Satellite Imagery Primary Survey  |
| *Soil                  | Physio-Chemical Characteristics   | Once during the study period  | 6 (2 core & 4 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 (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<br>Continuous<br>Mechanical/Auto<br>matic Weather<br>Station | 1                                    | Site specific primary data &<br>Secondary Data from IMD Station                     |
| *Ambient Air Quality   | PM10<br>PM2.5<br>SO2<br>NOX<br>Fugitive Dust  | 24 hourly twice a week<br>(March – May 2024)                          | 7 (1 core & 6 buffer)                | IS 5182 Part 1-23<br>National Ambient Air Quality Standards, CPCB                   |
| *Noise Levels          | Ambient Noise   | Hourly observation for 24 Hours per location                          | 7 (1 core & 6 buffer zone)           | IS 9989<br>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.                           |

Source: On-site monitoring/sampling by EHS 360 Labs Private Limited in association with GEMS

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

### 3.1 LAND ENVIRONMENT

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

#### 3.1.1 Land Use/ Land Cover

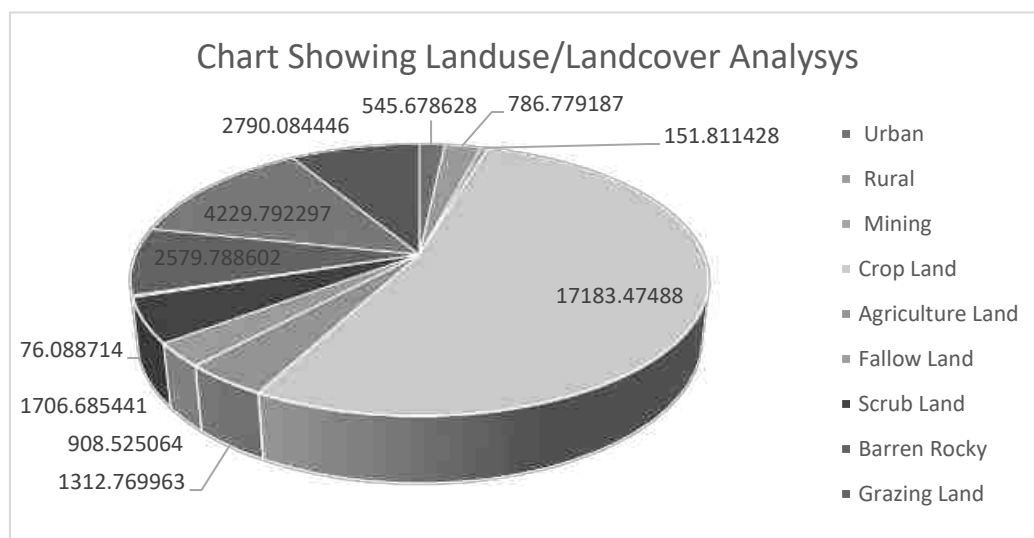
A visual interpretation technique has been adopted for land use classification based on the keys suggested in the chapter – V of the guidelines issued by NNRMS Bangalore & Level III classification with 1:50,000 scale for the preparation of land use mapping. Land use pattern of the area was studied through LISS III imagery of Bhuvan (ISRO). The 10 km radius map of study area was taken for analysis of Land use cover.

**TABLE 3.2: LAND USE / LAND COVER TABLE 10 Km RADIUS**

| S.No                              | CLASSIFICATION   | AREA_HA         | AREA_%        |
|-----------------------------------|------------------|-----------------|---------------|
| <b>BUILTUP</b>                    |                  |                 |               |
| 1                                 | Urban            | 545.68          | 1.69          |
| 2                                 | Rural            | 786.78          | 2.44          |
| 3                                 | Mining           | 151.81          | 0.47          |
| <b>AGRICULTURAL LAND</b>          |                  |                 |               |
| 4                                 | Crop Land        | 17183.47        | 53.25         |
| 5                                 | Agriculture Land | 1312.77         | 4.07          |
| 6                                 | Fallow Land      | 908.53          | 2.82          |
| <b>BARREN/WASTE/GRAZING LANDS</b> |                  |                 |               |
| 7                                 | Scrub Land       | 1706.69         | 5.29          |
| 8                                 | Barren Rocky     | 76.09           | 0.24          |
| 9                                 | Grazing Land     | 2579.79         | 7.99          |
| <b>FOREST</b>                     |                  |                 |               |
| 10                                | Forest           | 4229.79         | 13.11         |
| <b>WETLANDS/ WATER BODIES</b>     |                  |                 |               |
| 11                                | Waterbodies      | 2790.08         | 8.65          |
| <b>TOTAL</b>                      |                  | <b>32271.48</b> | <b>100.00</b> |

Source: Survey of India Toposheet and Landsat Satellite Imagery

**FIGURE 3.1: PIE DIAGRAM OF LAND USE AND LAND COVER**



From the above table, pie diagram and land use map it is inferred that the majority of the land in the study area is Agriculture land (includes crop land) 60.14% followed by Barren Land – 13.52% & Build Up Land is 4.6%.

The total mining area within the study area is 151.81 ha i.e., 0.47%. The cluster area of 10.49.36 ha contributes about 6.9% of the total mining area within the study area. This small percentage of Mining Activities shall not have any significant impact on the environment.

### 3.1.2 Topography

The project area is almost plain terrain having gentle slope towards South-eastern side, the North side of the area is existing Rough stone and Gravel quarry.

### 3.1.3 Drainage Pattern of the Area

The drainage pattern of the area is dendritic – sub dendritic. Drainage pattern is the pattern formed by the streams, rivers, and lakes in a particular drainage basin. They are governed by the topography of the land, whether a particular region is dominated by hard or soft rocks, and the gradient of the land. There are no streams, canals or water bodies crossing within the project area.

### 3.1.4 Seismic Sensitivity

The proposed project site falls in the seismic Zone II, least active zone as per BMTPC, Vulnerability Atlas of Seismic zone of India IS: 1893 – 2002. The project area falls in the hard rock terrain on the peninsular shield of south India which is highly stable.

### 3.1.5 Environmental Features in the Study Area

There is no National Park and Archaeological monuments within project area. No Protected and Reserved Forest area is involved in the project area. Therefore, there will be no need to acquisition/diversion of forest land. The details related to the environment sensitivity around the proposed mine lease area i.e., 10 km radius, are given in the below Table 3.3.

**TABLE 3.3: DETAILS OF ENVIRONMENT SENSITIVITY AROUND THE CLUSTER**

| Sl.No | Sensitive Ecological Features                      | Name                                 | Arial Distance in km from Cluster |
|-------|--|--------------------------------------|-----------------------------------|
| 1     | National Park / Wild life Sanctuaries              | None                                 | Nil within 10km Radius            |
| 2     | Reserved Forest                                    | Velamundi                            | 60m – North West                  |
| 3     | Tiger Reserve/ Elephant Reserve/ Biosphere Reserve | Sathiyamangalam Tiger reserve        | 8.77 km – North West              |
| 4     | Critically Polluted Areas                          | Coimbatore - SIDCO Industrial Estate | Around 57.5 km – South West       |
| 5     | Mangroves  | None                                 | Nil within 10km Radius            |
| 6     | Mountains/Hills                                    | None                                 | Nil within 10km Radius            |
| 7     | Notified Archaeological Sites                      | None                                 | Nil within 10km Radius            |
| 8     | Industries/ Thermal Power Plants                   | None                                 | Nil within 10km Radius            |
| 9     | Defence Installation                               | None                                 | Nil within 10km Radius            |

Source: Survey of India Toposheet

FIGURE 3.2: PHYSIOGRAPHIC MAP 10KM RADIUS

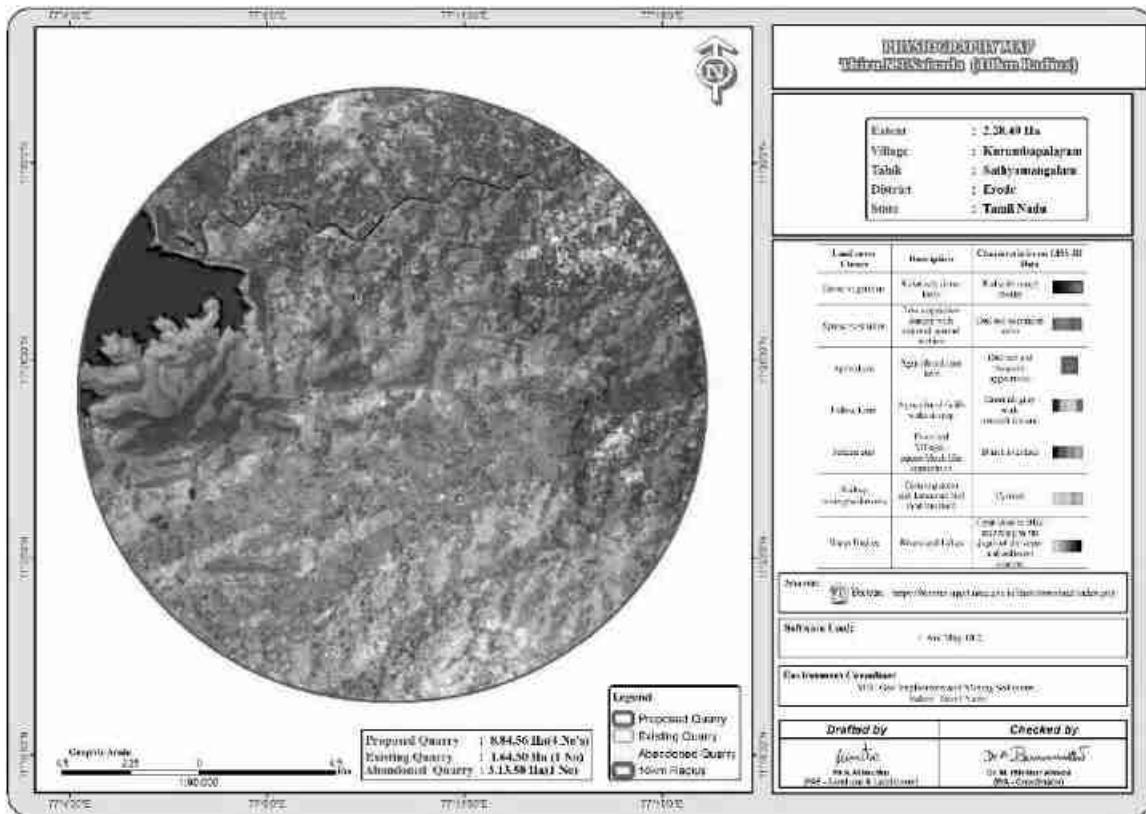
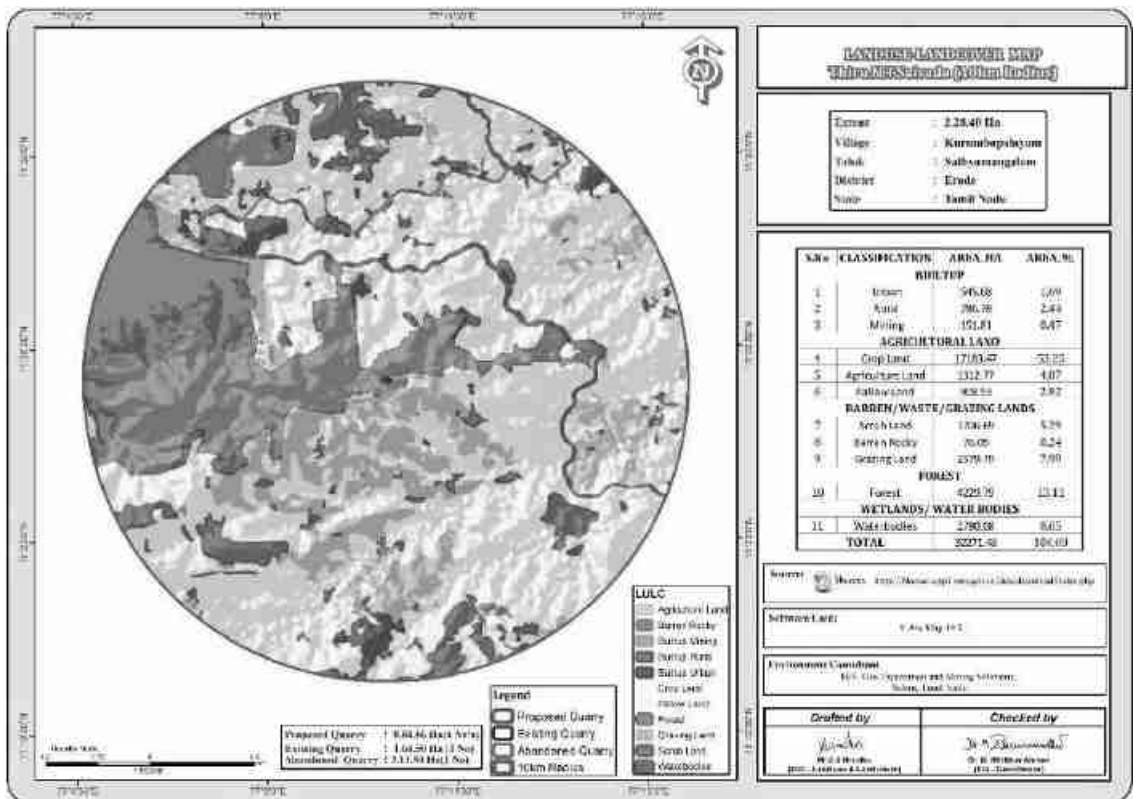


FIGURE 3.3: LAND USE LAND COVER MAP 10KM RADIUS



**TABLE 3.4: NEARBY WATER BODIES FROM THE PROPOSED PROJECT SITE**

| Sl.No | NAME                     | DISTANCE & DIRECTION |
|-------|--------------------------|----------------------|
| 1     | Odai                     | 180m - South         |
| 2     | Odai                     | 650m - NW            |
| 3     | Lower Bhavani Main Canal | 3.7Km - N            |
| 4     | Bhavanisagar Dam         | 5Km - NW             |
| 5     | Bhavani River            | 5Km - N              |
| 6     | Kavalaipalayam Lake      | 6.5Km - SE           |
| 7     | Odai                     | 6.7Km - SE           |
| 8     | Thenkarai Kulam          | 9.3Km - SW           |

Source: Village Cadastral Map and Field Survey

### 3.1.6 Soil Environment

Soil quality of the study area is one of the important components of the land environment. The composite soil samples were collected from the study area and analysed for different parameters. The locations of the monitoring sites are detailed in Table 3.5 and Figure 3.5.

#### The objective of the soil sampling is -

To determine the baseline soil characteristics of the study area; study the impact of proposed activity on soil characteristics and study the impact on soil more importantly agriculture production point of view.

**TABLE 3.5: SOIL SAMPLING LOCATIONS**

| S. No | LocationCode | Monitoring Locations | Distance & Direction | Coordinates                 |
|-------|--------------|----------------------|----------------------|-----------------------------|
| 1     | S-1          | Core Zone            | Project Area         | 11°25'51.35"N 77°10'13.25"E |
| 2     | S-2          | Kurumbapalayam       | 1km SE               | 11°25'22.52"N 77°10'30.57"E |
| 3     | S-3          | Thoppampalayam       | 4km NW               | 11°27'43.60"N 77° 8'47.01"E |
| 4     | S-4          | Mayilampatti         | 5.5km SW             | 11°23'36.82"N 77° 8'14.75"E |
| 5     | S-5          | Shenbagapudur        | 6.0km NE             | 11°27'48.60"N 77°12'55.68"E |
| 6     | S-6          | Kuppandurai          | 6km SE               | 11°23'50.31"N 77°12'45.89"E |

Source: On-site monitoring/sampling by EHS 360 Labs Private Limited in association with GEMS.

#### Methodology –

For studying soil quality, sampling locations were selected to assess the existing soil conditions in and around the project site representing various land use conditions. The samples were collected by auger boring into the soil up to 90-cm depth. Six (6) locations were selected for soil sampling on the basis of soil types, vegetative cover, industrial & residential activities including infrastructure facilities, which would accord an overall idea of the soil characteristics. The samples were analysed for physical and chemical characteristics. The samples were sent to laboratory for analysis. The samples were filled in Polythene bags, coded and sent to laboratory for analysis and the details of methodology in respect are given in below Table 3.6.

**TABLE 3.6: METHODOLOGY OF SAMPLING COLLECTION**

| Particulars | Details  |
|-------------|--|
| Frequency   | One grab sample from each station-once during the study period   |
| Methodology | Composite grab samples of the topsoil were collected from 3 depths, and mixed to provide a representative sample for analysis. They were stored in airtight Polythene bags and analysed at the laboratory. |

Source: On-site monitoring/sampling by EHS 360 Labs Private Limited in association with GEMS

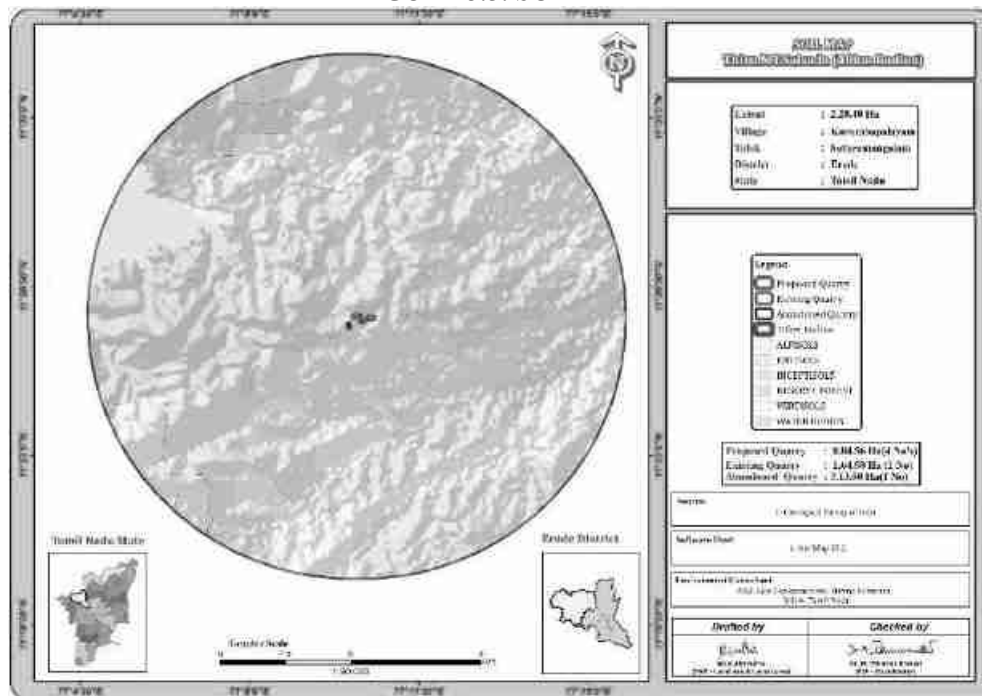
**Soil Testing Result –**

The samples were analysed 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 important properties analysed for soil are bulk density, porosity, infiltration rate, pH and Organic matter, kjeldahi Nitrogen, Phosphorous and Potassium. The standard classifications of soil are presented below in Figure 3.4 and the physico-chemical characteristics of the soil& Test Results in Table 3.7.

**FIGURE 3.4: SOIL SAMPLING LOCATIONS AROUND 10 KM RADIUS**



**FIGURE 3.5: SOIL MAP**





**TABLE 3.7: SOIL QUALITY OF THE STUDY AREA**

| Sl. No | TEST PARAMETERS                  | TEST METHOD   | UNIT              | S-1<br>Core Zone     | S-2<br>Kurumbapal<br>ayam | S-3<br>Thoppampala<br>yam | S-4<br>Mayilampatt<br>i | S-5<br>Shenbagapu<br>dur | S-6<br>Kuppandurai   |
|--------|----------------------------------|---|-------------------|----------------------|---------------------------|---------------------------|-------------------------|--------------------------|----------------------|
| 1      | Organic Matter                   | IS : 2720 Part 22   | %                 | 1.34                 | 2.64                      | 2                         | 1.26                    | 1.74                     | 1.81                 |
| 2      | pH                               | IS 2720 Part 26   | -                 | 8.56                 | 8.29                      | 8.86                      | 8.66                    | 8.91                     | 8.33                 |
| 3      | Specific Electrical Conductivity | IS 14767  | µmhos/cm          | 510                  | 452                       | 328                       | 502                     | 443                      | 466                  |
| 4      | Available Phosphorous            | IS 10158 : 1982   | mg/kg             | 4.13                 | 3.12                      | 2.23                      | 2.55                    | 3.12                     | 3.12                 |
| 5      | Available Potassium              | USEPA Method  | mg/kg             | 30                   | 45                        | 7.9                       | 35                      | 15                       | 18.7                 |
| 6      | Exchangeable Calcium (as Ca)     | Food and Agriculture organization of the united Nation Rome 2007 : 2018 | mg/kg             | 51.6                 | 75.2                      | 30                        | 95.6                    | 52.6                     | 45.5                 |
| 7      | Exchangeable Magnesium (as Mg)   | Food and Agriculture organization of the united Nation Rome 2007 : 2018 | mg/kg             | 30.5                 | 69                        | 28.5                      | 60.3                    | 34.4                     | 25.2                 |
| 8      | Sulphate as SO <sub>4</sub>      | IS 2720 Part 27   | %                 | 0.0018               | 0.0017                    | 0.0017                    | 0.0031                  | 0.0019                   | 0.001                |
| 9      | Chloride                         | APHA 23rd Edn 2019 4500 Cl B  | mg/kg             | 58.5                 | 19.5                      | 40                        | 46                      | 25                       | 52                   |
| 10     | Cation Exchange Capacity         | USEPA 9080 – 1986   | meq/100g of soil  | 40.2                 | 38.09                     | 42.23                     | 47.5                    | 44.4                     | 35.6                 |
| 11     | Bulk Density                     | By Cylindrical Method   | g/cm <sup>3</sup> | 1.1                  | 1.01                      | 0.99                      | 1.03                    | 1.05                     | 1.11                 |
| 12     | Texture: Sand                    | Gravimetric Method  | %                 | 32.2                 | 32.8                      | 30.8                      | 30.9                    | 30.1                     | 31.8                 |
| 13     | Texture: Silt                    | Gravimetric Method  | %                 | 36.1                 | 37                        | 36.1                      | 36.9                    | 37.4                     | 37.7                 |
| 14     | Texture: Clay                    | Gravimetric Method  | %                 | 31.7                 | 30.2                      | 33.1                      | 32.2                    | 32.5                     | 30.5                 |
| 15     | Water Holding Capacity           | Gravimetric Method  | %                 | 46.8                 | 45.4                      | 47.7                      | 49.8                    | 42.8                     | 46                   |
| 16     | Available Nitrogen as N          | IS 14684 : 1999   | mg/kg             | 380.5                | 410                       | 412                       | 465.4                   | 405                      | 451.5                |
| 17     | Permeability                     | By Gravimetric Method   | %                 | 45.1                 | 43.9                      | 48.1                      | 45.12                   | 41.5                     | 47.1                 |
| 18     | Exchangeable Manganese           | USEPA Method  | mg/kg             | 15.1                 | 24.5                      | 20.4                      | 19.5                    | 15.5                     | 35                   |
| 19     | Exchangeable Zinc                | USEPA Method  | mg/kg             | 3.12                 | 7.15                      | 5.61                      | 4.88                    | 2.35                     | 5.26                 |
| 20     | Cadmium as Cd                    | USEPA Method  | mg/kg             | BDL (DL : 1.0 mg/kg) | BDL (DL : 1.0 mg/kg)      | BDL (DL : 1.0 mg/kg)      | BDL (DL : 1.0 mg/kg)    | BDL (DL : 1.0 mg/kg)     | BDL (DL : 1.0 mg/kg) |

|    |                |                         |       |                         |                         |                         |                         |                         |                         |
|----|----------------|-------------------------|-------|-------------------------|-------------------------|-------------------------|-------------------------|-------------------------|-------------------------|
| 21 | Chromium as Cr | USEPA Method            | mg/kg | BDL (DL :<br>1.0 mg/kg) | BDL (DL :<br>1.0 mg/kg) | 2.05                    | 15.9                    | 4.12                    | 11                      |
| 22 | Copper as Cu   | USEPA Method            | mg/kg | BDL (DL :<br>1.0 mg/kg) | BDL (DL :<br>1.0 mg/kg) | BDL (DL :<br>1.0 mg/kg) | BDL (DL :<br>1.0 mg/kg) | BDL (DL :<br>1.0 mg/kg) | BDL (DL :<br>1.0 mg/kg) |
| 23 | Lead as Pb     | USEPA Method            | mg/kg | 0.59                    | 1.05                    | 0.97                    | 1.57                    | 2.55                    | 2.11                    |
| 24 | Iron as Fe     | USEPA Method            | mg/kg | 5.41                    | 1.25                    | 1.12                    | 2.23                    | 11.4                    | 5.23                    |
| 25 | Organic Carbon | IS : 2720 Part 22: 1972 | mg/kg | 0.81                    | 1.53                    | 1.16                    | 0.73                    | 1.01                    | 1.05                    |
| 26 | Boron as B     | USEPA Method            | mg/kg | 2.15                    | 3.1                     | 5.26                    | 2.91                    | 4.12                    | 1.05                    |

Source: Sampling Results by EHS 360 Labs Private Limited

## Interpretation & Conclusion

### Physical Characteristics –

The physical properties of the soil samples were examined for texture, bulk density, porosity and water holding capacity. The soil texture found in the study area is Clay (30.2-33.1%) Sandy Loam Soil and Bulk Density of Soils in the study area varied between 0.19-1.11g/cm<sup>3</sup>. The Water Holding Capacity of the soil samples is found to be medium i.e., ranging from 42.8-49.8 %.

### Chemical Characteristics –

- The nature of soil is slightly alkaline to strongly alkaline with pH range 8.21- 8.91
- The available Nitrogen content range between 380.5 – 465.4 mg/kg
- The available Phosphorus content range between 2.23 – 4.13 mg/kg
- The available Potassium range between 7.9 – 45 mg/kg

### Observation:

The pH of the Soil indicates that the soil is Neutral and arid region and ideal for plant growth.

## 3.2 WATER ENVIRONMENT

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

### 3.2.1 Surface Water Resources:

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

### 3.2.2 Ground Water Resources:

Groundwater occurs in all the crystalline formations of oldest Achaeans and Recent Alluvium. The occurrence and behaviour of groundwater are controlled by rainfall, topography, geomorphology, geology, structures etc., The weathering is controlled by the intensity of weathering and fracturing. Dug wells as wells as bore wells are more common ground water abstraction structures in the area. The diameter of the dug well is in the range of 7 to 10 m and depth of dug wells range from 7.2 to 13 m bgl. The dug wells yield up to 1 lps in summer months and few wells remains dry. The yield is adequate for irrigation for one or two crops in monsoon period.

### 3.2.3 Methodology

Reconnaissance survey was undertaken and monitoring locations were finalized based on;

- Drainage pattern;
- Location of Residential areas representing different activities/likely impact areas; and
- Likely areas, which can represent baseline conditions

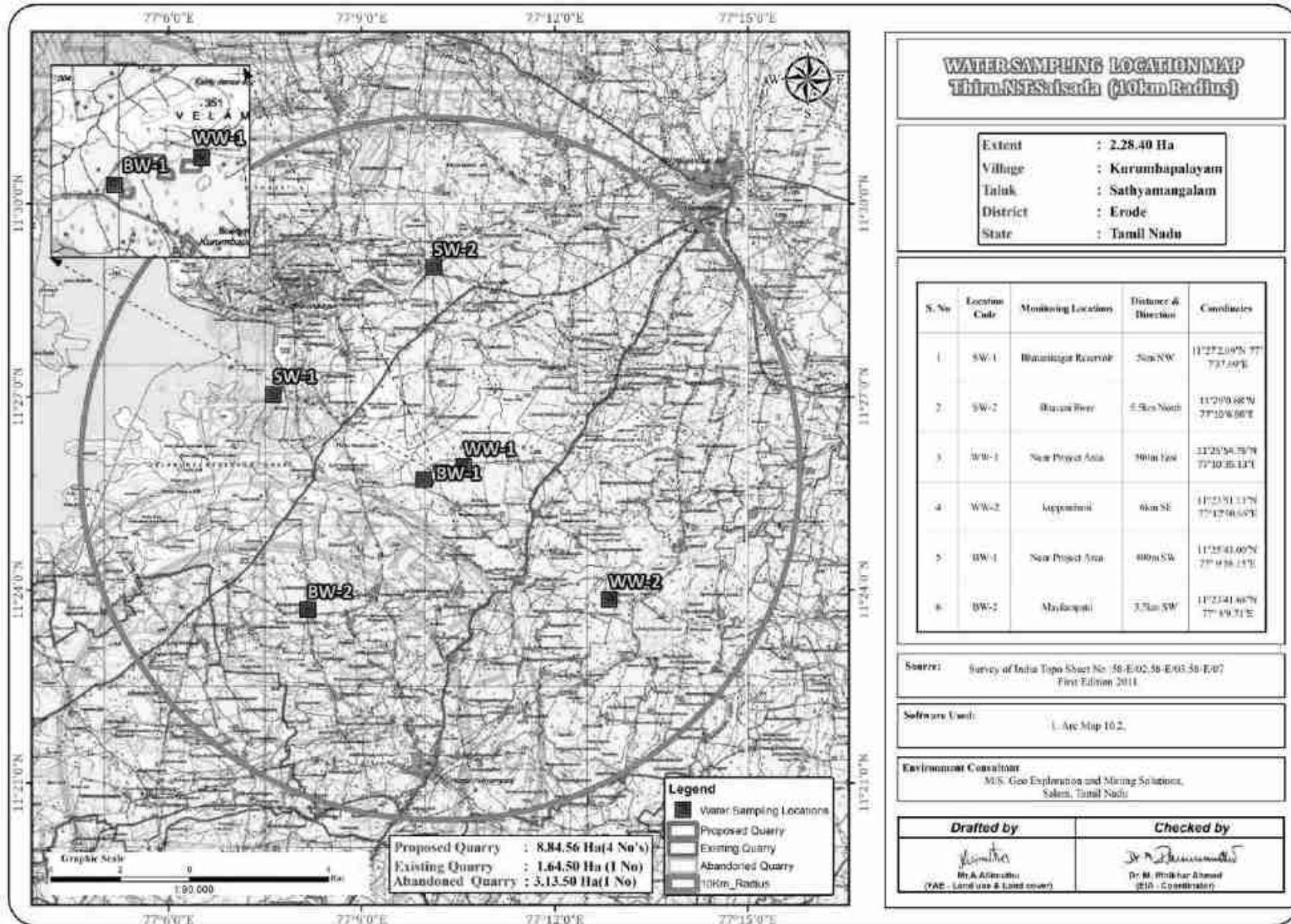
Two (2) surface water and Four (4) ground water samples were collected from the study area and were analysed for physio-chemical, heavy metals and bacteriological parameters in order to assess the effect of mining and other activities on surface and ground water. The samples were analysed as per the procedures specified by CPCB, IS-10500:2012 and 'Standard methods for the Examination of Water and Wastewater' published by American Public Health Association (APHA). The water sampling locations are given in Table 3.8 and shown as Figure 3.5.

**TABLE 3.8: WATER SAMPLING LOCATIONS**

| S.NO                 | CODE | LOCATIONS              | DISTANCE & DIRECTION | CO-ORDINATES                |
|----------------------|------|------------------------|----------------------|-----------------------------|
| <b>SURFACE WATER</b> |      |                        |                      |                             |
| 1                    | SW-1 | Bhavanisagar Reservoir | 5km NW               | 11°27'2.09"N 77° 7'37.69"E  |
| 2                    | SW-2 | Bhavani River          | 5.5km North          | 11°29'0.68"N 77°10'6.96"E   |
| <b>GROUND WATER</b>  |      |                        |                      |                             |
| 3                    | WW-1 | Near Project Area      | 500m East            | 11°25'54.76"N 77°10'35.13"E |
| 4                    | WW-2 | kuppandurai            | 6km SE               | 11°23'51.11"N 77°12'50.65"E |
| 5                    | BW-1 | Near Project Area      | 400m SW              | 11°25'43.00"N 77° 9'58.15"E |
| 6                    | BW-2 | Mayilampatti           | 5.5km SW             | 11°23'41.68"N 77° 8'9.71"E  |

Source: On-site monitoring/sampling by EHS 360 Labs Private Limited in association with GEMS

**FIGURE 3.6: WATER SAMPLING LOCATIONS AROUND 10 KM RADIUS**



**TABLE 3.9: GROUND WATER SAMPLING RESULTS**

| Sl. No. | TEST PARAMETERS                           | TEST METHOD                  | UNIT      | WW1-Near Project area | WW2-Kuppandurai      | BW1-Near Near Project area | BW2- Mayilampatti    |
|---------|---|------------------------------|-----------|-----------------------|----------------------|----------------------------|----------------------|
| 1       | Color                                     | IS 3025 PART 4               | Hazen     | 5                     | 5                    | 5                          | 5                    |
| 2       | Odor                                      | IS 3025 PART 5               | -         | Agreeable             | Agreeable            | Agreeable                  | Agreeable            |
| 3       | pH  | IS 3025 PART11               | -         | 6.89                  | 7.05                 | 7.51                       | 7.12                 |
| 4       | Conductivity                              | IS 3025 PART14               | µs/cm     | 910                   | 919                  | 780                        | 988                  |
| 5       | Turbidity                                 | IS 3025 PART10               | NTU       | 1.1                   | 1                    | 1                          | 1                    |
| 6       | Total Dissolved Solids                    | IS 3025 PART16               | mg/l      | 538                   | 542                  | 460                        | 583                  |
| 7       | Total Alkalinity as CaCO <sub>3</sub>     | IS 3025 PART 23              | mg/l      | 172                   | 173                  | 140                        | 195                  |
| 8       | Total Hardness as CaCO <sub>3</sub>       | IS 3025 PART 21              | mg/l      | 181.79                | 191.76               | 166.15                     | 189.2                |
| 9       | Calcium as Ca                             | IS 3025 PART40               | mg/l      | 34.3                  | 32.2                 | 28.2                       | 31.5                 |
| 10      | Magnesium as Mg                           | IS 3025 PART 46              | mg/l      | 23.4                  | 27.1                 | 23.3                       | 26.9                 |
| 11      | Chloride as Cl <sup>-</sup>               | IS 3025 PART 32              | mg/l      | 110                   | 118                  | 81.1                       | 130                  |
| 12      | Sulphate as SO <sub>4</sub> <sup>-</sup>  | IS 3025 PART24               | mg/l      | 65                    | 62.5                 | 55.5                       | 66.5                 |
| 13      | Iron as Fe                                | IS 3025 PART 53              | mg/l      | 0.18                  | 0.22                 | 0.11                       | 0.37                 |
| 14      | Boron as B                                | IS 3025 Part 65              | mg/l      | BDL(DL : 0.05 mg/l)   | BDL(DL : 0.05 mg/l)  | BDL(DL : 0.05 mg/l)        | BDL(DL : 0.05 mg/l)  |
| 15      | Free Residual Chlorine as Cl <sub>2</sub> | IS 3025 PART 26              | mg/l      | BDL (DL:0.1 mg/l)     | BDL (DL:0.1 mg/l)    | BDL (DL:0.1 mg/l)          | BDL (DL:0.1 mg/l)    |
| 16      | Fluoride as F                             | APHA 23rd Edn. 2017:4500 F,D | mg/l      | 0.21                  | 0.23                 | 0.31                       | 0.26                 |
| 17      | Manganese as Mn                           | IS 3025 Part 65              | mg/l      | BDL (DL:0.02 mg/l)    | BDL (DL:0.02 mg/l)   | BDL (DL:0.02 mg/l)         | BDL (DL:0.02 mg/l)   |
| 18      | Nitrate as NO <sub>3</sub>                | IS 3025 PART 34              | mg/l      | 4.54                  | 4.2                  | 5.12                       | 5.1                  |
| 19      | Total Suspended Solids                    | IS 3025 Part 29              | mg/l      | BDL (DL:1.0 mg/l)     | BDL (DL:1.0 mg/l)    | BDL (DL:1.0 mg/l)          | BDL (DL:1.0 mg/l)    |
| 20      | Phenolic Compounds                        | IS 3025 PART 43              | mg/l      | BDL (DL:0.0005 mg/l)  | BDL (DL:0.0005 mg/l) | BDL (DL:0.0005 mg/l)       | BDL (DL:0.0005 mg/l) |
| 21      | Anionic Detergents                        | IS 13428                     | mg/l      | BDL (DL:0.01 mg/l)    | BDL (DL:0.01 mg/l)   | BDL (DL:0.01 mg/l)         | BDL (DL:0.01 mg/l)   |
| 22      | Cyanide                                   | IS 3025 PART 27              | mg/l      | BDL (DL:0.01 mg/l)    | BDL (DL:0.01 mg/l)   | BDL (DL:0.01 mg/l)         | BDL (DL:0.01 mg/l)   |
| 23      | Sulphide                                  | IS 3025 Part 38              | mg/l      | BDL (DL:0.01 mg/l)    | BDL (DL:0.01 mg/l)   | BDL (DL:0.01 mg/l)         | BDL (DL:0.01 mg/l)   |
| 24      | Copper as Cu                              | IS 3025 Part 65              | mg/l      | BDL (DL:0.01 mg/l)    | BDL (DL:0.01 mg/l)   | BDL (DL:0.01 mg/l)         | BDL (DL:0.01 mg/l)   |
| 25      | Mercury (Hg)                              | IS 3025 Part 65              | mg/l      | BDL (DL:0.0005 mg/l)  | BDL (DL:0.0005 mg/l) | BDL (DL:0.0005 mg/l)       | BDL (DL:0.0005 mg/l) |
| 26      | Cadmium as Cd                             | IS 3025 Part 65              | mg/l      | BDL (DL:0.001 mg/l)   | BDL (DL:0.001 mg/l)  | BDL (DL:0.001 mg/l)        | BDL (DL:0.001 mg/l)  |
| 27      | Selenium                                  | IS 3025 Part 65              | mg/l      | BDL (DL:0.005 mg/l)   | BDL (DL:0.005 mg/l)  | BDL (DL:0.005 mg/l)        | BDL (DL:0.005 mg/l)  |
| 28      | Aluminium as Al                           | IS 3025 Part 65              | mg/l      | BDL (DL:0.005 mg/l)   | BDL (DL:0.005 mg/l)  | BDL (DL:0.005 mg/l)        | BDL (DL:0.005 mg/l)  |
| 29      | Lead as Pb                                | IS 3025 Part 65              | mg/l      | BDL (DL:0.005 mg/l)   | BDL (DL:0.005 mg/l)  | BDL (DL:0.005 mg/l)        | BDL (DL:0.005 mg/l)  |
| 30      | Zinc as Zn                                | IS 3025 Part 65              | mg/l      | BDL(DL : 0.05 mg/l)   | BDL(DL : 0.05 mg/l)  | BDL(DL : 0.05 mg/l)        | BDL(DL : 0.05 mg/l)  |
| 31      | Total Chromium as Cr                      | IS 3025 Part 65              | mg/l      | BDL(DL : 0.02 mg/l)   | BDL(DL : 0.02 mg/l)  | BDL(DL : 0.02 mg/l)        | BDL(DL : 0.02 mg/l)  |
| 32      | Barium as Ba                              | IS 3025 Part 44:             | mg/l      | BDL(DL:0.05 mg/l)     | BDL(DL:0.05 mg/l)    | BDL(DL:0.05 mg/l)          | BDL(DL:0.05 mg/l)    |
| 33      | Molybdenum as Mo                          | IS 3025 Part 65              | mg/l      | BDL (DL:0.02 mg/l)    | BDL (DL:0.02 mg/l)   | BDL (DL:0.02 mg/l)         | BDL (DL:0.02 mg/l)   |
| 34      | Arsenic as As                             | IS 3025 Part 34              | mg/l      | BDL (DL:0.005 mg/l)   | BDL (DL:0.005 mg/l)  | BDL (DL:0.005 mg/l)        | BDL (DL:0.005 mg/l)  |
| 35      | Ammonia as NH <sub>3</sub>                | IS 3025 Part 58              | mg/l      | BDL (DL:0.01 mg/l)    | BDL (DL:0.01 mg/l)   | BDL (DL:0.01 mg/l)         | BDL (DL:0.01 mg/l)   |
| 36      | Mineral Oil                               | IS 3025 Part 39              | mg/l      | BDL(DL : 0.01 mg/l)   | BDL(DL : 0.01 mg/l)  | BDL(DL : 0.01 mg/l)        | BDL(DL : 0.01 mg/l)  |
| 37      | Total Coliforms                           | APHA 23rd Edn. 2017:9221B    | Per 100ml | 150 MPN/100ml         | 120 MPN/100ml        | 146 MPN/100ml              | 138 MPN/100ml        |
| 38      | <i>Escherichia coli</i>                   | APHA 23rd Edn. 2017:9221F    | Per 100ml | < 1.8 MPN/100ml       | < 1.8 MPN/100ml      | < 1.8 MPN/100ml            | < 1.8 MPN/100ml      |

Source: On-site monitoring/sampling by EHS 360 Labs Private Limited in association with GEMS

**TABLE 3.10: SURFACE WATER SAMPLING RESULTS**

| Sl. No. | TEST PARAMETERS                           | TEST METHOD                           | UNIT      | SW-1                   | SW-2                 |
|---------|---|---------------------------------------|-----------|------------------------|----------------------|
|         |   |                                       |           | Bhavanisagar Reservoir | Bhavani River        |
| 1       | Color                                     | IS 3025 PART 4                        | Hazen     | 5                      | 5                    |
| 2       | Odor                                      | IS 3025 PART 5                        | -         | Agreeable              | Agreeable            |
| 3       | pH  | IS 3025 PART11                        | -         | 7.62                   | 7.01                 |
| 4       | Conductivity                              | IS 3025 PART14                        | µmhos/cm  | 935                    | 1563                 |
| 5       | Turbidity                                 | IS 3025 PART10                        | NTU       | 6.5                    | 5.1                  |
| 6       | Total Dissolved Solids                    | IS 3025 PART16                        | mg/l      | 551                    | 490                  |
| 7       | Total Alkalinity as CaCO <sub>3</sub>     | IS 3025 PART 23                       | mg/l      | 180                    | 155                  |
| 8       | Total Hardness as CaCO <sub>3</sub>       | IS 3025 PART 21                       | mg/l      | 189.92                 | 176.65               |
| 9       | Calcium as Ca                             | IS 3025 PART40                        | mg/l      | 34.1                   | 30.1                 |
| 10      | Magnesium as Mg                           | IS 3025 PART 46                       | mg/l      | 25.5                   | 24.7                 |
| 11      | Chloride as Cl <sup>-</sup>               | IS 3025 PART 32                       | mg/l      | 102.2                  | 100.3                |
| 12      | Sulphate as SO <sub>4</sub> <sup>-</sup>  | IS 3025 PART24                        | mg/l      | 59.5                   | 55                   |
| 13      | Iron as Fe                                | IS 3025 PART 53                       | mg/l      | 0.21                   | 0.21                 |
| 14      | Boron as B                                | IS 3025 Part 65                       | mg/l      | BDL(DL : 0.05 mg/l)    | BDL(DL : 0.05 mg/l)  |
| 15      | Free Residual Chlorine as Cl <sub>2</sub> | IS 3025 PART 26                       | mg/l      | BDL (DL:0.1 mg/l)      | BDL (DL:0.1 mg/l)    |
| 16      | Fluoride as F                             | APHA 23rd Edn. 2017:4500 F,D          | mg/l      | 0.17                   | 0.27                 |
| 17      | Manganese as Mn                           | IS 3025 Part 65                       | mg/l      | BDL (DL:0.02 mg/l)     | BDL (DL:0.02 mg/l)   |
| 18      | Nitrate as NO <sub>3</sub>                | IS 3025 PART 34                       | mg/l      | 10.2                   | 10                   |
| 19      | Dissolved Oxygen                          | IS 3025 PART 38                       | mg/l      | 5.5                    | 5.2                  |
| 20      | Bio-Chemical Oxygen Demand                | IS 3025 PART 44                       | mg/l      | 8.6                    | 8.1                  |
| 21      | Chemical Oxygen Demand                    | IS 3025 PART 58                       | mg/l      | 40                     | 30                   |
| 22      | Ammonia as NH <sub>3</sub>                | IS 3025 PART 34                       | mg/l      | 1.3                    | 1.12                 |
| 23      | Total Suspended Solids                    | IS 3025 PART 17                       | mg/l      | 14                     | 20                   |
| 24      | Phenolic Compounds                        | IS 3025 PART 43                       | mg/l      | BDL (DL:0.0005 mg/l)   | BDL (DL:0.0005 mg/l) |
| 25      | Anionic Detergents                        | IS 13428                              | mg/l      | BDL (DL:0.01 mg/l)     | BDL (DL:0.01 mg/l)   |
| 26      | Cyanide                                   | IS 3025 PART 27                       | mg/l      | BDL (DL:0.01 mg/l)     | BDL (DL:0.01 mg/l)   |
| 27      | Sulphide                                  | IS 3025 Part 29                       | mg/l      | BDL (DL:0.01 mg/l)     | BDL (DL:0.01 mg/l)   |
| 28      | Copper as Cu                              | IS 3025 Part 65                       | mg/l      | BDL (DL:0.01 mg/l)     | BDL (DL:0.01 mg/l)   |
| 29      | Mercury (Hg)                              | IS 3025 Part 65                       | mg/l      | BDL (DL:0.0005 mg/l)   | BDL (DL:0.0005 mg/l) |
| 30      | Cadmium as Cd                             | IS 3025 Part 65                       | mg/l      | BDL (DL:0.001 mg/l)    | BDL (DL:0.001 mg/l)  |
| 31      | Selenium                                  | IS 3025 Part 65                       | mg/l      | BDL (DL:0.005 mg/l)    | BDL (DL:0.005 mg/l)  |
| 32      | Aluminium as Al                           | IS 3025 Part 65                       | mg/l      | BDL (DL:0.005 mg/l)    | BDL (DL:0.005 mg/l)  |
| 33      | Lead as Pb                                | IS 3025 Part 65                       | mg/l      | BDL (DL:0.005 mg/l)    | BDL (DL:0.005 mg/l)  |
| 34      | Zinc as Zn                                | IS 3025 Part 65                       | mg/l      | BDL(DL : 0.05 mg/l)    | BDL(DL : 0.05 mg/l)  |
| 35      | Total Chromium as Cr                      | IS 3025 Part 65                       | mg/l      | BDL(DL : 0.02 mg/l)    | BDL(DL : 0.02 mg/l)  |
| 36      | Barium as Ba                              | IS 3025 Part 65                       | mg/l      | BDL(DL : 0.05 mg/l)    | BDL(DL:0.05 mg/l)    |
| 37      | Molybdenum as Mo                          | IS 3025 Part 65                       | mg/l      | BDL (DL:0.02 mg/l)     | BDL (DL:0.02 mg/l)   |
| 38      | Arsenic as As                             | IS 3025 Part 65                       | mg/l      | BDL (DL:0.005 mg/l)    | BDL (DL:0.005 mg/l)  |
| 39      | Mineral Oil                               | IS 3025 Part 39                       | mg/l      | BDL(DL : 0.01 mg/l)    | BDL(DL : 0.01 mg/l)  |
| 40      | Total Coliforms                           | APHA 23 <sup>rd</sup> Edn. 2017:9221B | MPN/100ml | 500 MPN/100ml          | 610 MPN/100ml        |
| 41      | <i>Escherichia coli</i>                   | APHA 23 <sup>rd</sup> Edn. 2017:9221F | MPN/100ml | 110 MPN/100ml          | 120 MPN/100ml        |

Source: On-site monitoring/sampling by EHS 360 Labs Private Limited in association with GEMS

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### 3.2.4 Interpretation & Conclusion

#### Surface Water

The pH varied from 7.01 to 7.62 while turbidity found within the standards (Optimal pH range for sustainable aquatic life is 6.5 to 8.5 pH).

#### Total Dissolved Solids:

Total Dissolved Solids varied from 490 to 551 mg/l, the TDS mainly composed of carbonates, bicarbonates, Chlorides, phosphates and nitrates of calcium, magnesium, sodium and other organic matter.

#### Other parameters:

Chloride content is 100.3 to 102.2mg/l. Nitrates varied from while sulphates varied from 40 to 45mg/l.

#### Ground Water

The pH of the water samples collected ranged from 6.89 to 7.51 and within the acceptable limit of 6.5 to 8.5. pH, Sulphates and Chlorides of water samples from all the sources are within the limits as per the Standard. On Turbidity, the water samples meet the requirement. Total Dissolved Solids were found in the range of 460 to 583mg/l in all samples. Total hardness varied between 166.15 to 191.76mg/l for all samples.

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

### 3.2.5 Hydrology and Hydrogeological studies

The district is underlain by hard rock formation fissured and fractured crystalline rocks constitute the important aquifer systems in the district. Geophysical prospecting was carried out in that area by SSRMP-80 Instrument by qualified Geo physicist with the help of IGIS software and it was inferred that the low resistance encountered at the depth between 68m-73m. The maximum depth proposed out of proposed projects is 41 BGL.

#### Ground water levels and Flow Direction based on the Bore well and open well Data's

In general, the ground water movement is based on the gradient i.e., water moves from the highest static ground water elevation to lowest static ground water elevation point. The ground water movement is important aspect to locating the recharge and discharge areas. Therefore, the data has been collected in the study area. Water level measured in the 7 open wells and 6 borewells.

The average water level in the open well is varies from = 11.5m to 12.3m bgl

The water level in the bore well is varies from = 56.5m to 57m bgl

Based on the water level contour map of the open well and bore well the water flow direction in the particular region is towards North side.

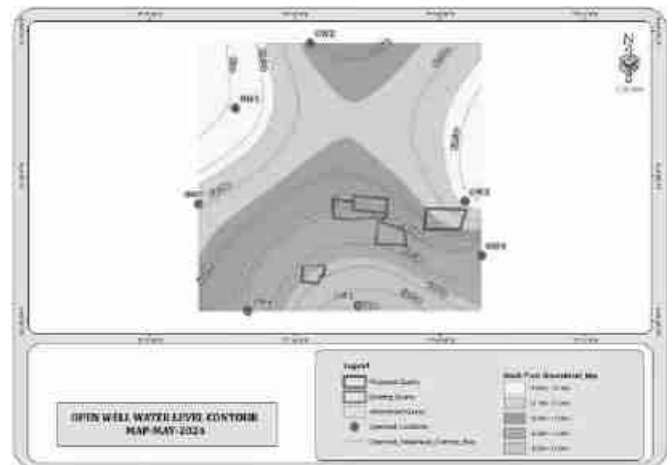
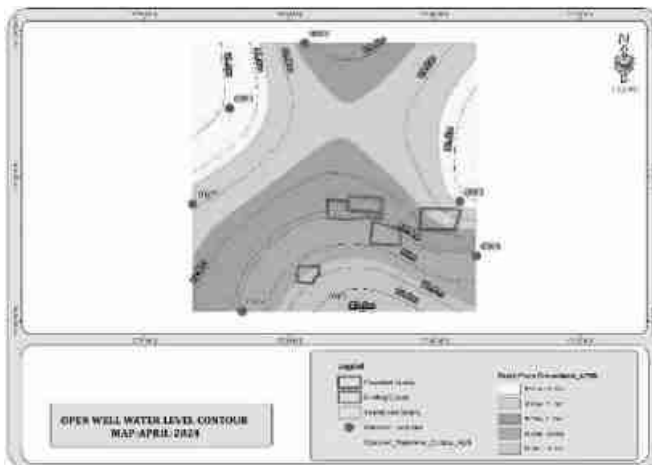
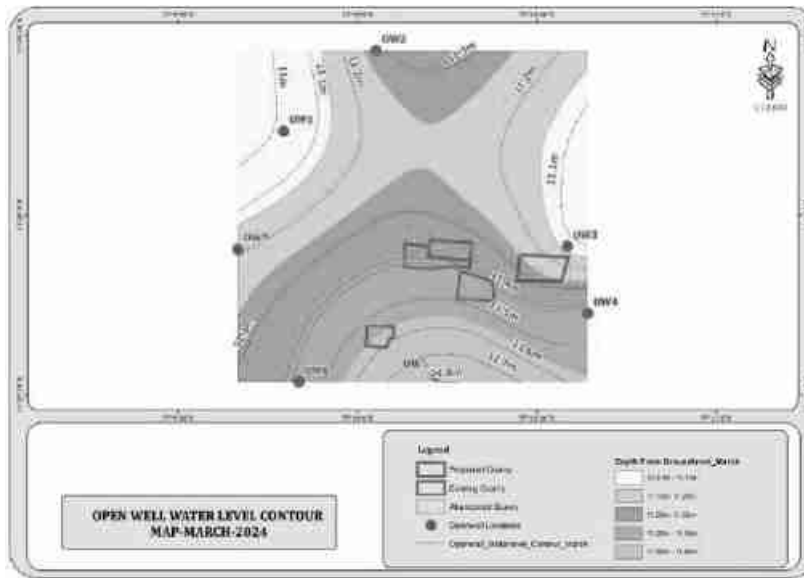
The water level in the area is above 68m-73m hence there is no possibilities of water table intersection during the entire mine life period besides it is also inferred topographically that there are no major water bodies intersecting the project area.

**TABLE 3.11: POST MONSOON SEASON WATER LEVEL OF OPEN WELLS 1 KM RADIUS**

| S.NO | LABEL | LONGITUDE       | LATITUDE        | MARCH-24 | APRIL-24 | MAY-24 |
|------|-------|-----------------|-----------------|----------|----------|--------|
| 1    | OW-1  | 11° 26' 14.03"N | 77° 09' 47.61"E | 11.0     | 11.5     | 12     |
| 2    | OW-2  | 11° 26' 27.49"N | 77° 10' 03.11"E | 11.3     | 11.8     | 12.3   |
| 3    | OW-3  | 11° 25' 54.78"N | 77° 10' 35.12"E | 11.1     | 11.6     | 12.1   |
| 4    | OW-4  | 11° 25' 43.56"N | 77° 10' 38.56"E | 11.5     | 12.0     | 12.5   |
| 5    | OW-5  | 11° 25' 33.21"N | 77° 10' 13.02"E | 11.8     | 12.3     | 12.8   |
| 6    | OW-6  | 11° 25' 32.11"N | 77° 09' 50.19"E | 11.4     | 11.9     | 12.4   |
| 7    | OW-7  | 11° 25' 54.28"N | 77° 09' 40.00"E | 11.2     | 11.7     | 12.2   |

Source: Onsite monitoring data

**FIGURE 3.7: OPEN WELL CONTOUR MAP MARCH TO MAY 2024**



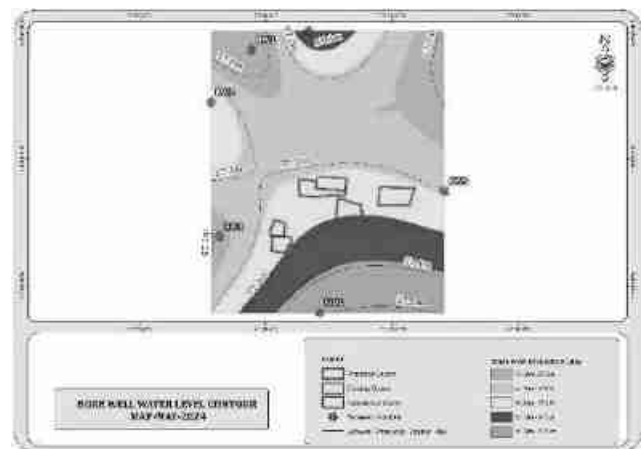
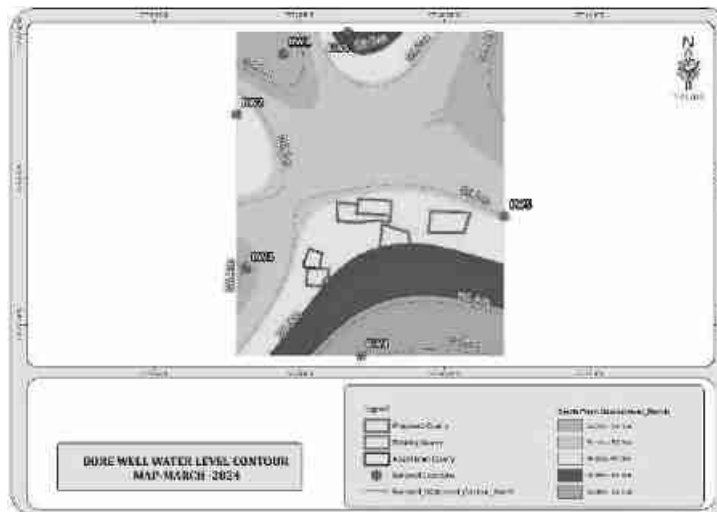


**TABLE 3.12: POST MONSOON SEASON WATER LEVEL OF BOREWELLS 1 KM RADIUS**

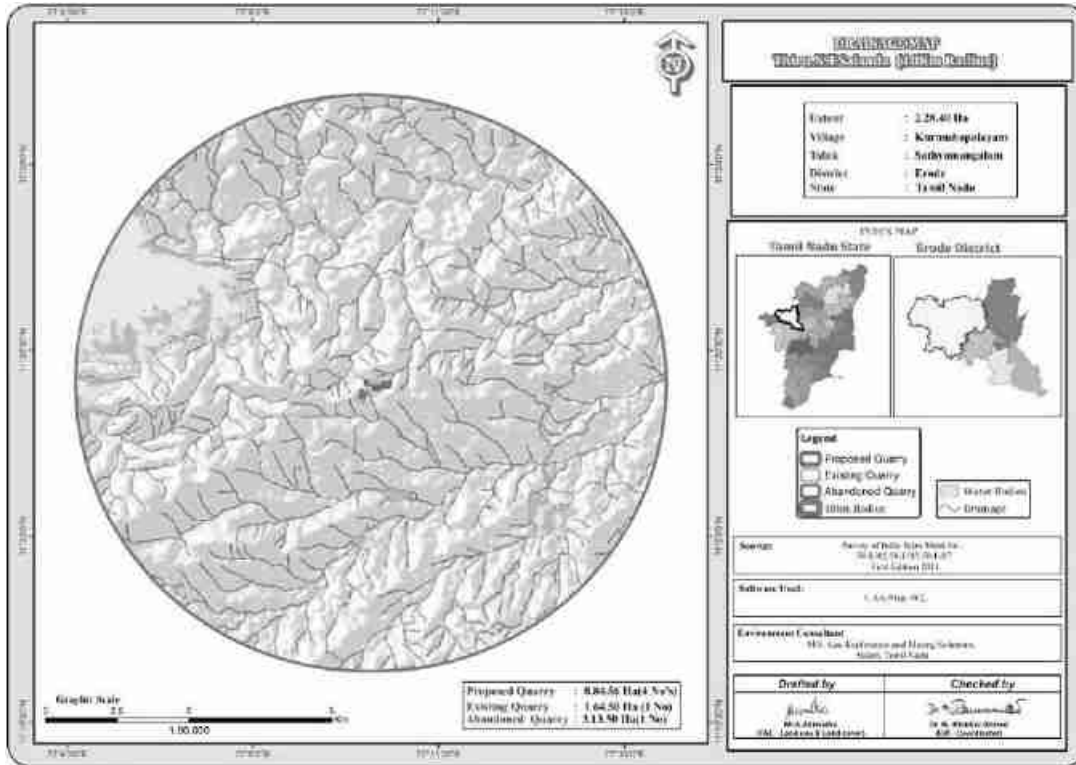
| S.NO | LABEL | LONGITUDE       | LATITUDE        | MARCH-24 | APRIL-24 | MAY-24 |
|------|-------|-----------------|-----------------|----------|----------|--------|
| 1    | BW-1  | 11° 26' 25.84"N | 77° 09' 56.70"E | 56.0     | 56.5     | 57.0   |
| 2    | BW-2  | 11° 26' 13.39"N | 77° 09' 47.01"E | 56.3     | 56.8     | 57.3   |
| 3    | BW-3  | 11° 25' 41.49"N | 77° 09' 49.04"E | 56.1     | 56.6     | 57.1   |
| 4    | BW-4  | 11° 25' 23.45"N | 77° 10' 12.82"E | 56.5     | 57.0     | 57.5   |
| 5    | BW-5  | 11° 25' 52.32"N | 77° 10' 42.39"E | 56.2     | 56.7     | 57.2   |
| 6    | BW-6  | 11° 26' 30.27"N | 77° 10' 10.09"E | 56.4     | 56.9     | 57.4   |

Source: Onsite monitoring data

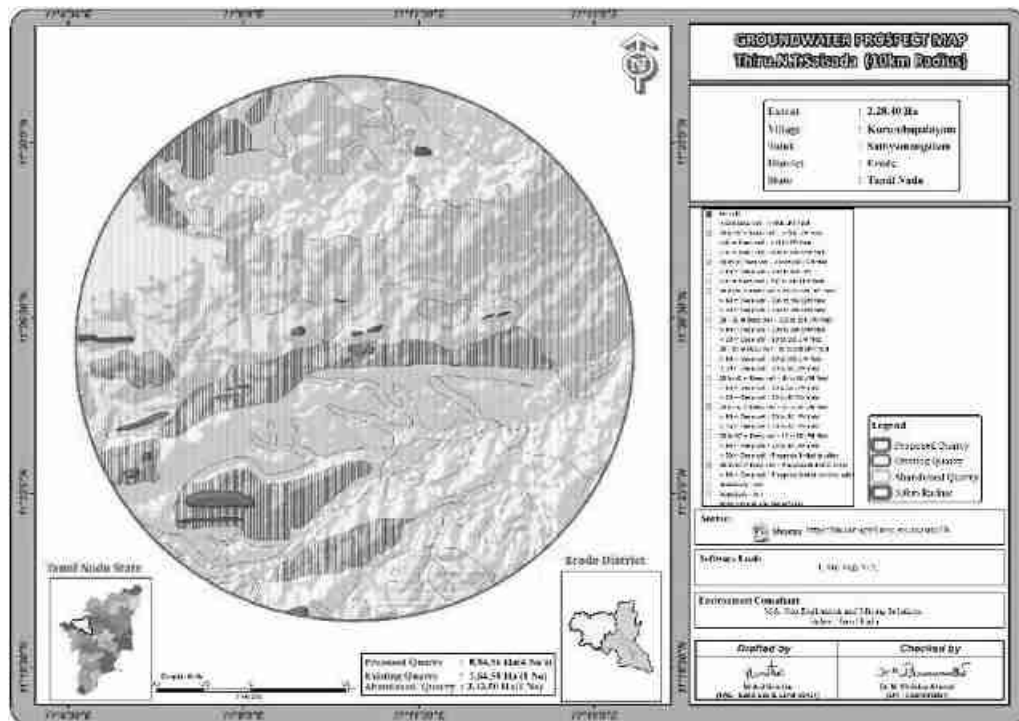
**FIGURE 3.8: BOREWELL CONTOUR MARCH TO MAY 2024**



**FIGURE 3.9: DRAINAGE MAP AROUND 10 KM RADIUS FROM PROJECT SITE**



**FIGURE 3.10: GROUND WATER PROSPECT MAP**



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## Geophysical Resistivity Survey

### 3.2.5.1 Methodology and Data Acquisition

The Geophysical Electrical Resistivity survey conducted in the area Schlumberger configuration, Vertical Electrical Sounding (VES) method. Schlumberger electrode set up was employed for making sounding measurements. Since it is least influenced by lateral in homogeneities and is capable of providing higher depth of investigation. This is four electrodes collinear set up where in the outer electrodes send current into the ground and the inner electrodes measure the potential difference.

The present study utilizes maximum current electrode separation  $AB/2$ . The data from this survey are commonly arranged and contoured in the form of Pseudo-section that gives an approximate of the subsurface resistivity. This technique is used for the inversion of Schlumberger VES data to predict the layer parameter namely layer resistivity and Geo electric layer thickness. The main goal of the present study is to search the vertical in homogeneities that is consistent with the measured data.

For a Schlumberger among the Apparent resistivity can be calculated as follows.

$$\rho_a = \frac{G\Delta V}{I}$$

$\Delta V$  = potential difference between receiving electrodes

$G$  = Geometric Factor.

Rocks show wide variation in resistivity ranging from 10<sup>-8</sup> more than 10<sup>+14</sup> ohmmeter. On a broad classification, one can group the rocks falling in the range of 10<sup>-8</sup> to 1 ohmmeter as good conductors. 1 to 106 ohmmeter as intermediate conductors and 106 to 10<sup>12</sup> ohmmeter as more as poor conductor. The resistivity of rocks and subsurface lithology, which is mostly dependent on its porosity and the pore fluid resistivity is defined by Archie's Law,

$$\rho_r = F\rho_w = a \emptyset^m \rho_w$$

$\rho_r$  = Resistivity of Rocks

$\rho_w$  = Resistivity of water in pores of rock

$F$  = Formation Factor

$\emptyset$  = Fractional pore volume

$a$  = Constants with values ranging from 0.5 to 2.5

### 3.2.5.2 Survey Layout

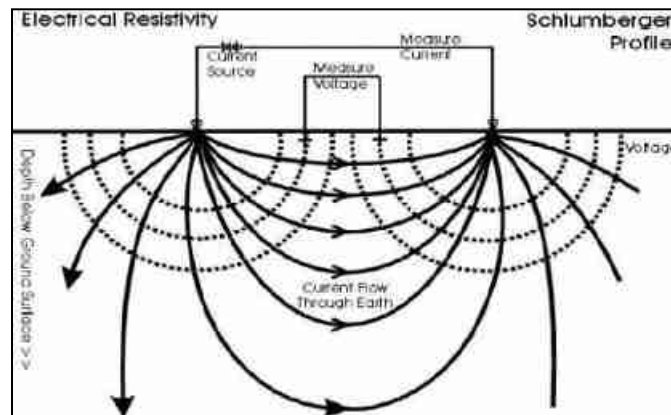
The field equipment deployed for the study is in a deep resistivity meter with a model of SSR – MP – AT. This Signal stacking Resistivity meter is a high-quality data acquisition system incorporating several innovation features for Earth resistivity. In the presence of random earth Noises the signal to noise ration can be enhanced by  $\sqrt{N}$  where  $N$  is the number of stacked readings. This SSR meter in which running averages of measurements  $[1, (1+2)/2, (1+2+3)/3 \dots (1+2\dots+16/16)]$  up to the chosen stacks are displayed and the final average is stored automatically, in memory utilizing the principles of stacking to achieve the benefit of high signals to noise ratio. Based on these above significations the signal stacking resistivity meter was used for (VES) Vertical Electric Resistivity Sounding.

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## RESISTIVITY SURVEY PROFILE



Measurements of ground Resistivity is essentially done by sending a current through two electrodes called current electrodes ( $C_1$  &  $C_2$ ) and measuring the resulting potential by two other electrodes called potential electrode ( $P_1$  &  $P_2$ ). The amount of current required to be sent into the ground depends on the contact resistance at the current electrode, the ground resistivity and the depth of interest.

### 3.2.5.3 Data Presentation

It was inferred that the low resistance encountered at the depth between 70-65m. The maximum depth proposed out of proposed projects 28m BGL. Hence there is no possibilities of water table intersection during the entire mine life period besides it is also inferred topographically that there are no major water bodies intersecting the project area.

### 3.2.5.4 Geophysical Data Interpretation

The geophysical data was obtained to study the lateral variations, vertical in homogeneities in the sub – surface with respect to the availability of groundwater. From the interpreted data, it has inferred that the area has moderate groundwater potential in the investigated area. This small quarrying operation will not have any significant impact on the natural water bodies.

It is inferred that the existing quarries in the surrounding area reaches maximum of 45m and the water table is not intersected, only the seepage water during rainy season encountered from the upper layer and it will be used for the Greenbelt development, Dust suppression and quarrying operation.

## 3.3 AIR ENVIRONMENT

The existing ambient air quality of the area is important for evaluating the impact of mining activities on the ambient air quality.

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

ambient air quality of the study area. These will also be useful for assessing the conformity to standards of the ambient air quality during the operation of proposed projects in cluster.

### 3.3.1 Meteorology & Climate

Meteorology is the key to understand the Air quality. The essential relationship between meteorological condition and atmospheric dispersion involves the wind in the broadest sense. Wind fluctuations over a very wide range of time, accomplish dispersion and strongly influence other processes associated with them.

A temporary meteorological station was installed at project site by covering cluster quarries. The station was installed at a height of 3 m above the ground level in such a way that there are no obstructions facilitating flow of wind, wind speed, wind direction, humidity and temperature are recorded on hourly basis.

#### Climate -

- The climate here is tropical. During the winter season, there is a significant decrease in precipitation levels within Erode as compared to the summer months. Köppen and Geiger classify this climate as Aw. The average temperature in Erode is 27.3 °C | 81.2 °F. About 802 mm | 31.6 inch of precipitation falls annually.
- The region of Erode is characterized by a temperate climate, and the summer season presents some challenges in terms of precise categorization. The most favored period for a visit is during the months of January, February, July, August, September, October, November, December.
- The driest month is January, with 6 mm | 0.2 inch of rain. The month of October experiences the highest amount of precipitation, with an average value of 150 mm | 5.9 inch.
- April is the warmest month of the year. The temperature in April averages 31.1 °C | 87.9 °F. The month of December is characterized by the lowest temperatures, which have an average reading of 24.5 °C | 76.0 °F.  
<https://en.climate-data.org/asia/india/tamil-nadu/erode-3878/>

## Rainfall

**TABLE 3.13: RAINFALL DATA**

| Actual Rainfall in mm |       |       |       |        | Normal Rainfall in mm |
|-----------------------|-------|-------|-------|--------|-----------------------|
| 2017                  | 2018  | 2019  | 2020  | 2021   |                       |
| 776.7                 | 772.7 | 664.2 | 629.5 | 1010.1 | 721.4                 |

Source: <https://www.twadboard.tn.gov.in/content/erode>

**TABLE 3.14: METEOROLOGICAL DATA RECORDED AT SITE**

| S.No | Parameters            |     | Mar-2024 | Apr-2024 | May-2024 |
|------|-----------------------|-----|----------|----------|----------|
| 1    | Temperature (°C)      | Max | 29.05    | 30.64    | 30.23    |
|      |                       | Min | 24.35    | 28.28    | 22.1     |
|      |                       | Avg | 26.7     | 29.46    | 26.16    |
| 2    | Relative Humidity (%) | Avg | 40.68    | 52.25    | 77.21    |
| 3    | Wind Speed (m/s)      | Max | 3.08     | 3.48     | 4.57     |
|      |                       | Min | 1.43     | 1.5      | 0.99     |

|   |                     |     |         |        |        |
|---|---------------------|-----|---------|--------|--------|
|   |                     | Avg | 2.25    | 2.49   | 2.78   |
| 4 | Cloud Cover (OKTAS) |     | 0-8     | 0-8    | 0-8    |
| 5 | Wind Direction      |     | ESE, SE | S, ESE | W, WSW |

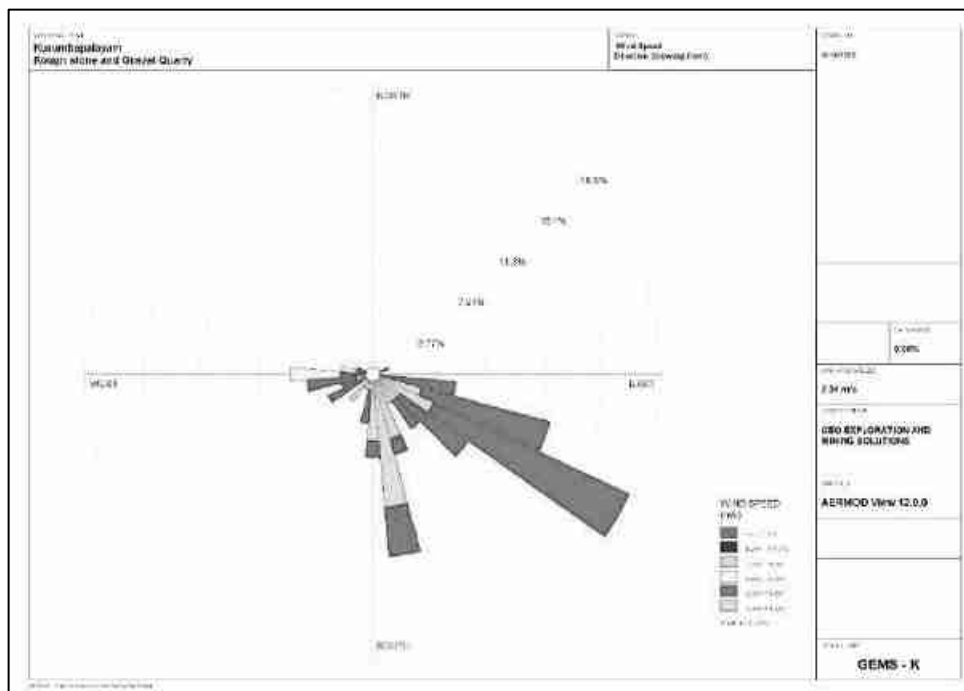
Source: On-site monitoring/sampling by EHS 360 Labs Private Limited in association with GEMS

#### Correlation between Secondary and Primary Data

The average rainfall over the period of five years 770.64mm. The meteorological data collected at the site is almost similar to that of secondary data collected from IMD Erode\_Agro. A comparison of site data generated during the three months with that of IMD, Erode\_Agro

Wind rose diagram of the study site is depicted in Figure. 3.14. Predominant downwind direction of the area during study season is East-North-East to SE

**FIGURE 3.11: WINDROSE DIAGRAM**



In the abstract of collected data wind rose were drawn on presented in figure No.3.13 during the monitoring period in the study area

1. Predominant winds were from ENE, SE, WSW, S, W
2. Wind velocity readings were recorded between 2.25-2.78 m/s
3. Temperature readings ranging from 26.16 to 29.46 °C
4. Relative humidity ranging from 40.68 to 77.21 %
5. The monitoring was carried out continuously for three months.

### 3.3.2 Methodology and Objective

The prime objective of the ambient air quality study is to assess the existing air quality of study area and its conformity to NAAQS. The observed sources of air pollution in the study area are industrial, traffic and domestic activities. The baseline status of the ambient air quality has been established 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; etc.,

### 3.3.3 Sampling and Analytical Techniques

**TABLE 3.15: METHODOLOGY AND INSTRUMENT USED FOR AAQ ANALYSIS**

| Parameter   | Method   | Instrument   |
|-------------|--|--|
| PM2.5       | Gravimetric Method<br>Beta attenuation Method          | Fine Particulate Sampler<br>Make – Thermo Environmental<br>Instruments – TEI 121 |
| PM10        | Gravimetric Method<br>Beta attenuation Method          | Respirable Dust Sampler<br>Make –Thermo Environmental<br>Instruments – TEI 108   |
| SO2         | IS-5182 Part II<br>(Improved West & Gaeke method)      | Respirable Dust Sampler with gaseous<br>attachment                               |
| NOx         | IS-5182 Part II<br>(Jacob & Hochheiser modifiedmethod) | Respirable Dust Sampler with gaseous<br>attachment                               |
| Free Silica | NIOSH – 7601   | Visible Spectrophotometry  |

Source: Sampling Methodology followed by EHS 360 Labs Private Limited & CPCB Notification

**TABLE 3.16: NATIONAL AMBIENT AIR QUALITY STANDARDS**

| Sl.No. | Pollutant  | Time Weighted Average      | Concentration in ambient air                 |   |
|--------|--|----------------------------|--|---|
|        |  |                            | Industrial, Residential, Rural & other areas | Ecologically Sensitive area (Notified by Central Govt.) |
| 1      | Sulphur Dioxide ( $\mu\text{g}/\text{m}^3$ )   | Annual Avg.*<br>24 hours** | 50.0<br>80.0                                 | 20.0<br>80.0  |
| 2      | Nitrogen Dioxide ( $\mu\text{g}/\text{m}^3$ )  | Annual Avg.<br>24 hours    | 40.0<br>80.0                                 | 30.0<br>80.0  |
| 3      | Particulate matter (size less than $10\mu\text{m}$ ) PM10 ( $\mu\text{g}/\text{m}^3$ )   | Annual Avg.<br>24 hours    | 60.0<br>100.0                                | 60.0<br>100.0   |
| 4      | Particulate matter (size less than $2.5\mu\text{m}$ ) PM2.5 ( $\mu\text{g}/\text{m}^3$ ) | 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

\*Annual Arithmetic mean of minimum 104 measurements in a year taken twice a Week 24 hourly at uniform interval,

\*\* 24 hourly / 8 hourly or 1 hourly monitored value as applicable shall be complied with 98 % of the time in a year. However, 2% of the time, they may exceed the limits but not on two consecutive days of monitoring.

### 3.3.4 Frequency & Parameters for Sampling

Ambient air quality monitoring has been carried out with a frequency of two samples per week at seven (7) locations, adopting a continuous 24 hourly (3 shift of 8-hour) schedule for the period March – May 2024. The baseline

data of ambient air has been generated for PM<sub>10</sub>, PM<sub>2.5</sub>, Sulphur Dioxide (SO<sub>2</sub>) & Nitrogen Dioxide (NO<sub>2</sub>) Monitoring has been carried out as per the CPCB, MoEF guidelines and notifications.

The equipment was placed preferably at a height of at least 3 ± 0.5m above the ground level at each monitoring station, for negating the effects of wind-blown ground dust. The equipment was placed at open space free from trees and vegetation which otherwise act as a sink of pollutants resulting in lower levels in monitoring results.

**3.3.5 Ambient Air Quality Monitoring Stations**

Seven (7) monitoring stations were set up in the study area as depicted in Figure 3.15 for assessment of the existing ambient air quality. Details of the sampling locations are as per given below.

**TABLE 3.17: AMBIENT AIR QUALITY (AAQ) MONITORING LOCATIONS**

| S. No | Location Code | Monitoring Locations | Distance & Direction | Coordinates                 |
|-------|---------------|----------------------|----------------------|-----------------------------|
| 1     | AAQ-1         | Core Zone            | Project Area         | 11°25'51.28"N 77°10'12.14"E |
| 2     | AAQ-2         | Near Project area    | 300m NE              | 11°25'58.06"N 77°10'26.56"E |
| 3     | AAQ-3         | Kurumbapalayam       | 1km SE               | 11°25'21.81"N 77°10'30.46"E |
| 4     | AAQ-4         | Thoppampalayam       | 4km NW               | 11°27'41.22"N 77° 8'46.69"E |
| 5     | AAQ-5         | Mayilampatti         | 5.5km SW             | 11°23'39.42"N 77° 8'9.34"E  |
| 6     | AAQ-6         | Shenbagapudur        | 6.0km NE             | 11°27'47.99"N 77°12'54.44"E |
| 7     | AAQ-7         | Kuppandurai          | 6km SE               | 11°23'57.54"N 77°12'45.63"E |

Source: On-site monitoring/sampling by EHS 360 Labs Private Limited in association with GEMS.

**FIGURE 3.12: AMBIENT AIR QUALITY LOCATIONS AROUND 10 KM RADIUS**

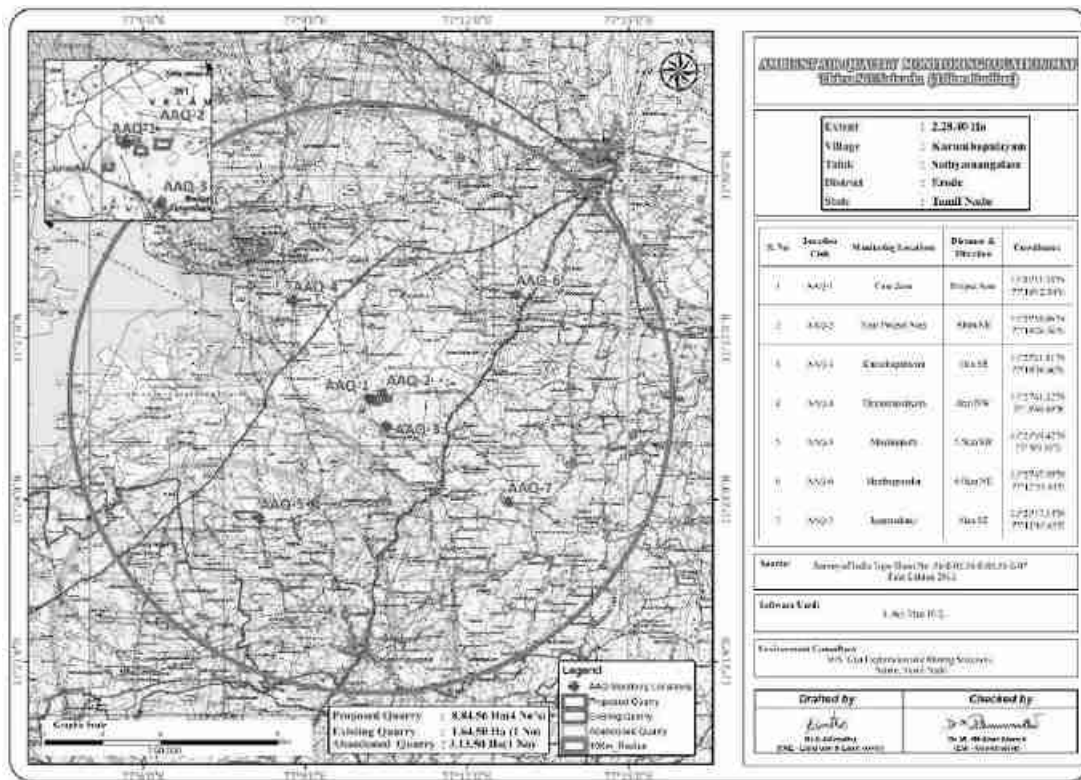


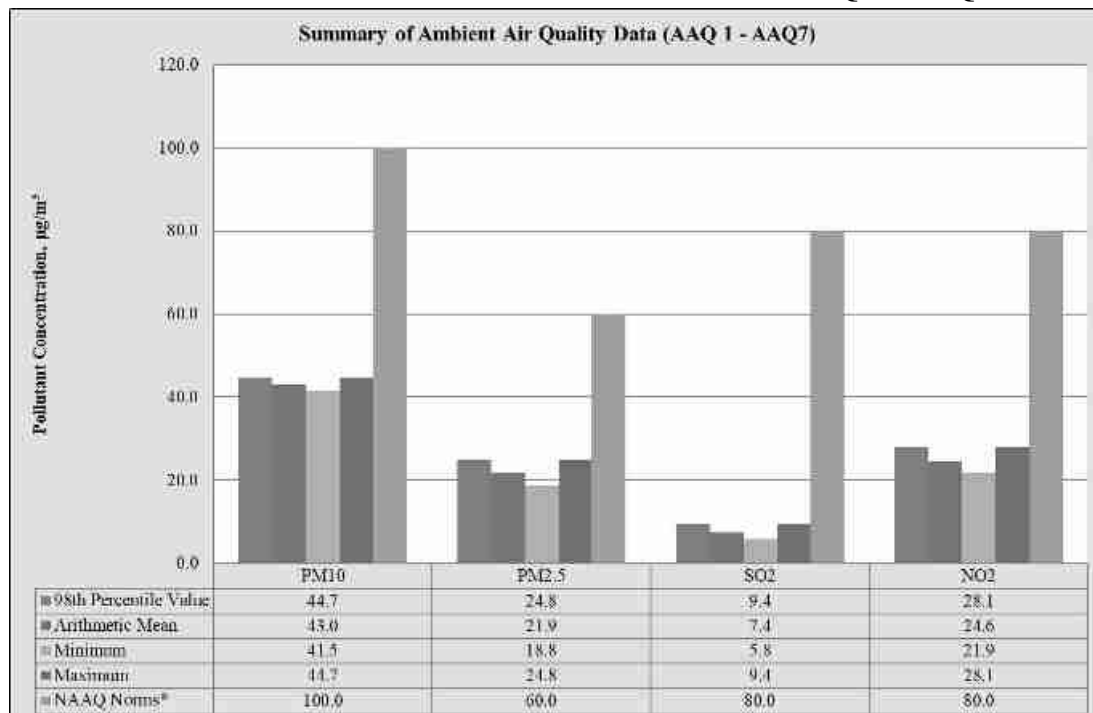


TABLE 3.18: SUMMARY OF AAQ 1 to AAQ 7

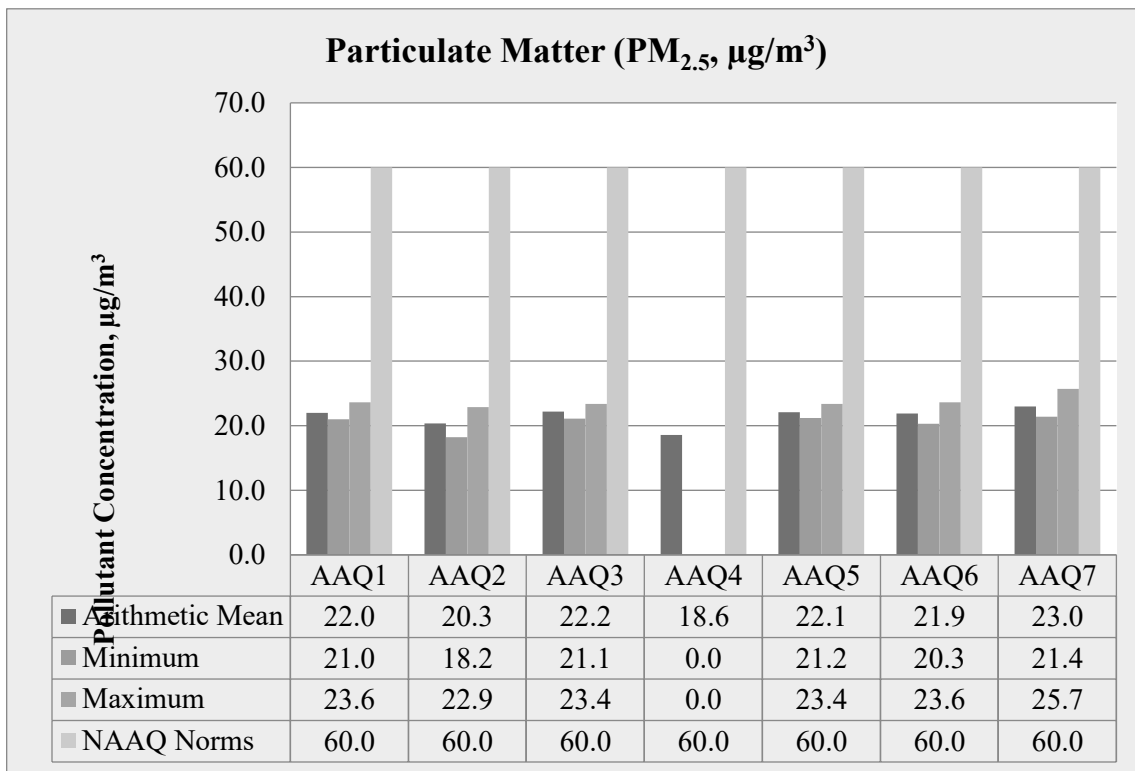
| PM10                  | AAQ1<br>Core<br>Zone | AAQ2<br>Near<br>Project<br>Area | AAQ3<br>Kurumbapalayam | AAQ4<br>Thoppampalayam | AAQ5<br>Mayilampatti | AAQ6<br>Shenbagapudur | AAQ7<br>Kuppandura |
|-----------------------|----------------------|---------------------------------|------------------------|------------------------|----------------------|-----------------------|--------------------|
| Arithmetic<br>Mean    | 43.3                 | 42.8                            | 41.9                   | 42.7                   | 43.2                 | 42.6                  | 42.7               |
| Minimum               | 42.1                 | 41.3                            | 40.7                   | 41.1                   | 41.5                 | 41.3                  | 41.2               |
| Maximum               | 45.8                 | 44.6                            | 42.9                   | 44.2                   | 44.9                 | 43.9                  | 44.5               |
| <b>NAAQ<br/>Norms</b> | 100.0                | 100.0                           | 100.0                  | 100.0                  | 100.0                | 100.0                 | 100.0              |
| <b>PM2.5</b>          | <b>AAQ1</b>          | <b>AAQ2</b>                     | <b>AAQ3</b>            | <b>AAQ4</b>            | <b>AAQ5</b>          | <b>AAQ6</b>           | <b>AAQ7</b>        |
| Arithmetic<br>Mean    | 22.0                 | 20.3                            | 22.2                   | 18.6                   | 22.1                 | 21.9                  | 23.0               |
| Minimum               | 21.0                 | 18.2                            | 21.1                   | 0.0                    | 21.2                 | 20.3                  | 21.4               |
| Maximum               | 23.6                 | 22.9                            | 23.4                   | 0.0                    | 23.4                 | 23.6                  | 25.7               |
| <b>NAAQ<br/>Norms</b> | 60.0                 | 60.0                            | 60.0                   | 60.0                   | 60.0                 | 60.0                  | 60.0               |
| <b>SO2</b>            | <b>AAQ1</b>          | <b>AAQ2</b>                     | <b>AAQ3</b>            | <b>AAQ4</b>            | <b>AAQ5</b>          | <b>AAQ6</b>           | <b>AAQ7</b>        |
| Arithmetic<br>Mean    | 7.4                  | 6.9                             | 7.6                    | 7.0                    | 6.5                  | 7.1                   | 7.0                |
| Minimum               | 6.4                  | 6.1                             | 5.7                    | 5.6                    | 5.1                  | 5.3                   | 5.2                |
| Maximum               | 8.7                  | 7.9                             | 9.5                    | 7.9                    | 8.7                  | 8.3                   | 9.8                |
| <b>NAAQ<br/>Norms</b> | 80.0                 | 80.0                            | 80.0                   | 80.0                   | 80.0                 | 80.0                  | 80.0               |
| <b>NO2</b>            | <b>AAQ1</b>          | <b>AAQ2</b>                     | <b>AAQ3</b>            | <b>AAQ4</b>            | <b>AAQ5</b>          | <b>AAQ6</b>           | <b>AAQ7</b>        |
| Arithmetic<br>Mean    | 23.4                 | 22.5                            | 26.3                   | 22.2                   | 24.1                 | 23.6                  | 25.5               |
| Minimum               | 21.2                 | 21.1                            | 24.9                   | 20.6                   | 21.9                 | 21.9                  | 23.1               |
| Maximum               | 25.3                 | 24.3                            | 29.7                   | 23.7                   | 26.6                 | 25.4                  | 27.4               |
| <b>NAAQ<br/>Norms</b> | 80.0                 | 80.0                            | 80.0                   | 80.0                   | 80.0                 | 80.0                  | 80.0               |

**TABLE 3.19: ABSTRACT OF AMBIENT AIR QUALITY DATA**

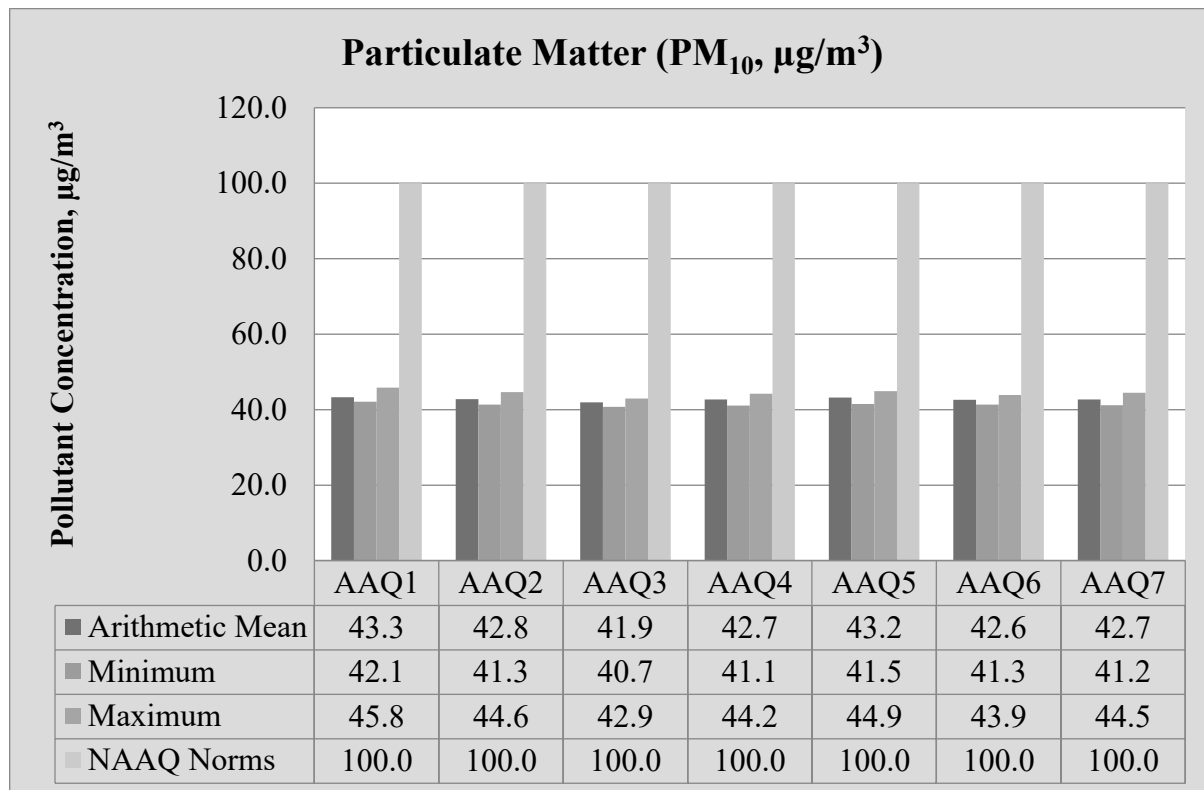
| S.No | Parameter                         | PM10 | PM2.5 | SO <sub>2</sub> | NO <sub>2</sub> |
|------|-----------------------------------|------|-------|-----------------|-----------------|
| 1    | No. of Observations               | 260  | 260   | 260             | 260             |
| 2    | 10 <sup>th</sup> Percentile Value | 41.5 | 18.8  | 5.8             | 21.9            |
| 3    | 20 <sup>th</sup> Percentile Value | 41.8 | 19.4  | 6.2             | 22.4            |
| 4    | 30 <sup>th</sup> Percentile Value | 42.2 | 20.8  | 6.4             | 22.8            |
| 5    | 40 <sup>th</sup> Percentile Value | 42.5 | 21.4  | 6.8             | 23.4            |
| 6    | 50 <sup>th</sup> Percentile Value | 42.7 | 21.7  | 7.1             | 23.7            |
| 7    | 60 <sup>th</sup> Percentile Value | 42.8 | 21.9  | 7.3             | 24.3            |
| 8    | 70 <sup>th</sup> Percentile Value | 43.2 | 22.3  | 7.5             | 24.9            |
| 9    | 80 <sup>th</sup> Percentile Value | 43.5 | 22.8  | 7.8             | 25.7            |
| 10   | 90 <sup>th</sup> Percentile Value | 43.9 | 23.4  | 8.3             | 26.4            |
| 11   | 95 <sup>th</sup> Percentile Value | 44.5 | 23.6  | 8.6             | 26.9            |
| 12   | 98 <sup>th</sup> Percentile Value | 44.7 | 24.8  | 9.4             | 28.1            |
| 13   | Arithmetic Mean                   | 43.0 | 21.9  | 7.4             | 24.6            |
| 14   | Geometric Mean                    | 43.0 | 21.8  | 7.3             | 24.5            |
| 15   | Standard Deviation                | 1.0  | 1.8   | 1.1             | 2.0             |
| 16   | Minimum                           | 41.5 | 18.8  | 5.8             | 21.9            |
| 17   | Maximum                           | 44.7 | 24.8  | 9.4             | 28.1            |
|      | % Values exceeding Norms*         | 0.0  | 0.0   | 0.0             | 0.0             |

**FIGURE 3.13: BAR DIAGRAM OF SUMMARY OF AAQ 1 – AAQ7**

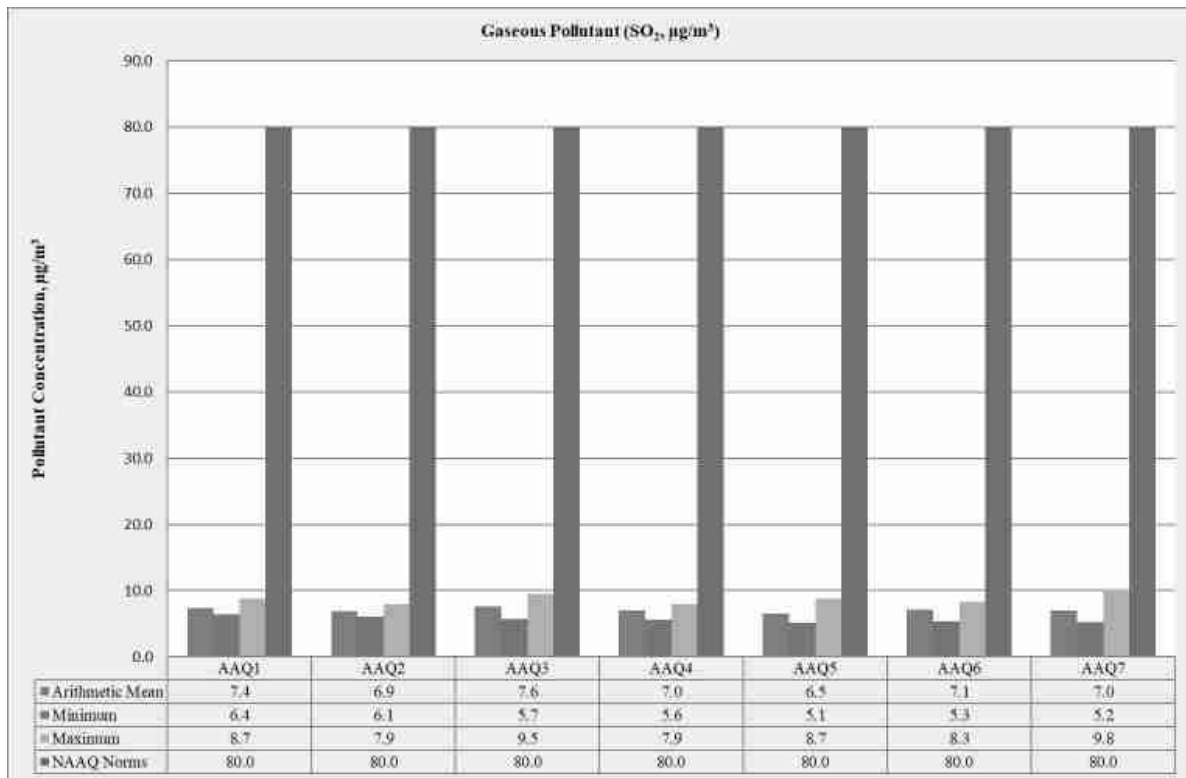
**FIGURE 3.14: BAR DIAGRAM OF PARTICULATE MATTER PM<sub>2.5</sub>**



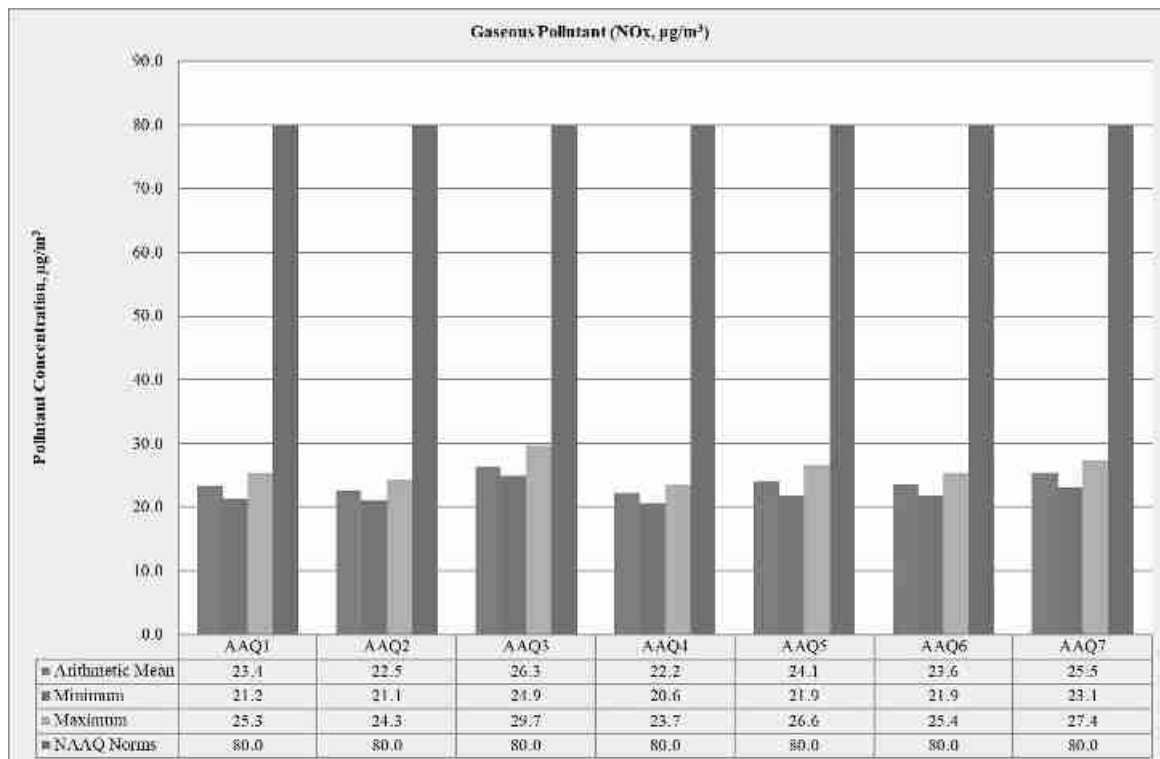
**FIGURE 3.15: BAR DIAGRAM OF PARTICULATE MATTER PM<sub>10</sub>**



**FIGURE 3.16: BAR DIAGRAM OF GASEOUS POLLUTANT SO<sub>2</sub>**



**FIGURE 3.17: BAR DIAGRAM OF GASEOUS POLLUTANT NO<sub>x</sub>**



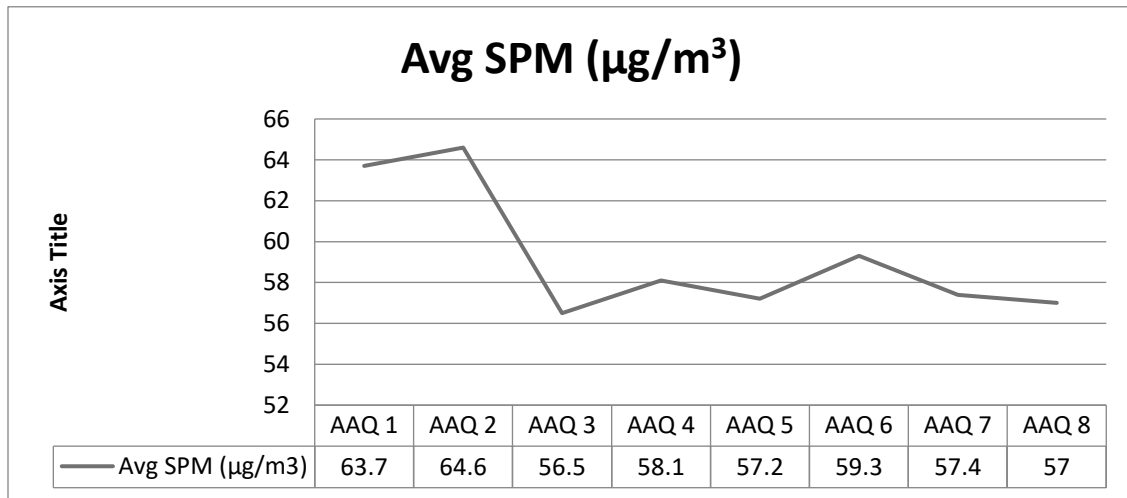
**3.3.7 FUGITIVE DUST EMISSION –**

Fugitive dust was recorded at 7AAQ monitoring stations for 30 days average during the study period.

**TABLE 3.20: FUGITIVE DUST SAMPLE VALUES IN  $\mu\text{g}/\text{m}^3$**

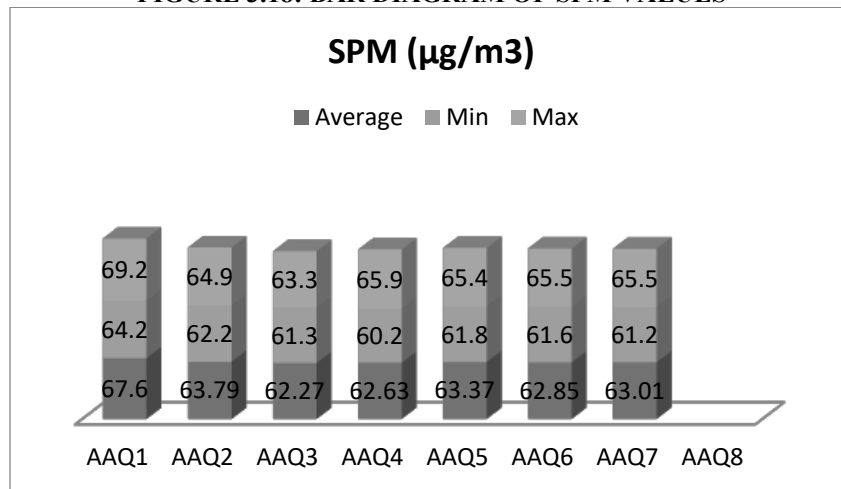
| SPM ( $\mu\text{g}/\text{m}^3$ ) | AAQ1 | AAQ2  | AAQ3  | AAQ4  | AAQ5  | AAQ6  | AAQ7  |
|----------------------------------|------|-------|-------|-------|-------|-------|-------|
| <b>Average</b>                   | 67.6 | 63.79 | 62.27 | 62.63 | 63.37 | 62.85 | 63.01 |
| <b>Min</b>                       | 64.2 | 62.2  | 61.3  | 60.2  | 61.8  | 61.6  | 61.2  |
| <b>Max</b>                       | 69.2 | 64.9  | 63.3  | 65.9  | 65.4  | 65.5  | 65.5  |

**FIGURE 3.21: LINE DIAGRAM OF AVERAGE SPM VALUES**



Source: Calculations from Lab Analysis Reports

**FIGURE 3.18: BAR DIAGRAM OF SPM VALUES**



**3.3.6 Interpretations & Conclusion**

As per monitoring data,  $\text{PM}_{10}$  ranges from  $41.9\mu\text{g}/\text{m}^3$  to  $43.3\mu\text{g}/\text{m}^3$ ,  $\text{PM}_{2.5}$  data ranges from  $18.6\mu\text{g}/\text{m}^3$  to  $22.2\mu\text{g}/\text{m}^3$ ,  $\text{SO}_2$  ranges from  $6.5\mu\text{g}/\text{m}^3$  to  $7.6\mu\text{g}/\text{m}^3$  and  $\text{NO}_2$  data ranges from  $22.2\mu\text{g}/\text{m}^3$  to  $24.1\mu\text{g}/\text{m}^3$ . The concentration levels of the above criteria pollutants were observed to be well within the limits of NAAQS prescribed by CPCB.

### 3.4 NOISE ENVIRONMENT

The vehicular movement on road and mining activities is the major sources of noise in study area, the environmental assessment of noise from the mining activity and vehicular traffic can be undertaken by taking into consideration various factors like potential damage to hearing, physiological responses, and annoyance and general community responses. The main objective of noise monitoring in the study area is to establish the baseline noise level and assess the impact of the total noise expected to be generated during the project operations around the project site.

#### 3.4.1 Identification of Sampling Locations

In order to assess the ambient noise levels within the study area, noise monitoring was carried out at Eight (7) locations. The noise level measurement was carried out at each ambient air quality station. The main aim of the noise level monitoring is

- To assess the ambient Noise level in the study area
- Type of noise pollution generated in the core zone
- To predict the temporal changes in the ambient noise level in the area

The noise level monitoring locations were carried out by covering commercial, residential, rural areas within the radius of 10km. A noise monitoring methodology was chosen such that it best suited the purpose and objectives of the study.

**TABLE 3.21: DETAILS OF SURFACE NOISE MONITORING LOCATIONS**

| S. No | Location Code | Monitoring Locations | Distance & Direction | Coordinates                 |
|-------|---------------|----------------------|----------------------|-----------------------------|
| 1     | N-1           | Core Zone            | Project Area         | 11°25'51.51"N 77°10'10.00"E |
| 2     | N-2           | Near Project Area    | 300m NE              | 11°25'58.11"N 77°10'25.55"E |
| 3     | N-3           | Kurumbapalayam       | 1km SE               | 11°25'20.76"N 77°10'29.91"E |
| 4     | N-4           | Thoppampalayam       | 4km NW               | 11°27'42.98"N 77° 8'47.69"E |
| 5     | N-5           | Mayilampatti         | 5.5km SW             | 11°23'38.14"N 77° 8'9.62"E  |
| 6     | N-6           | Shenbagapudur        | 6.0km NE             | 11°27'48.13"N 77°12'53.21"E |
| 7     | N-7           | Kuppandurai          | 6km SE               | 11°23'57.54"N 77°12'44.90"E |

Source: On-site monitoring/sampling by EHS 360 Labs Private Limited in association with GEMS.

#### 3.4.2 Method of Monitoring

Digital Sound Level Meter was used for the study. All reading was taken on the 'A-Weighting' frequency network, at a height of 1.5 meters from ground level. The sound level meter does not give a steady and consistent reading and it is quite difficult to assess the actual sound level over the entire monitoring period. To mitigate this shortcoming, the Continuous Equivalent Sound level, indicated by Leq, is used. Equivalent sound level, 'Leq', can be obtained from variable sound pressure level, 'L', over a time period by using following equation. The equivalent noise level is defined mathematically as,

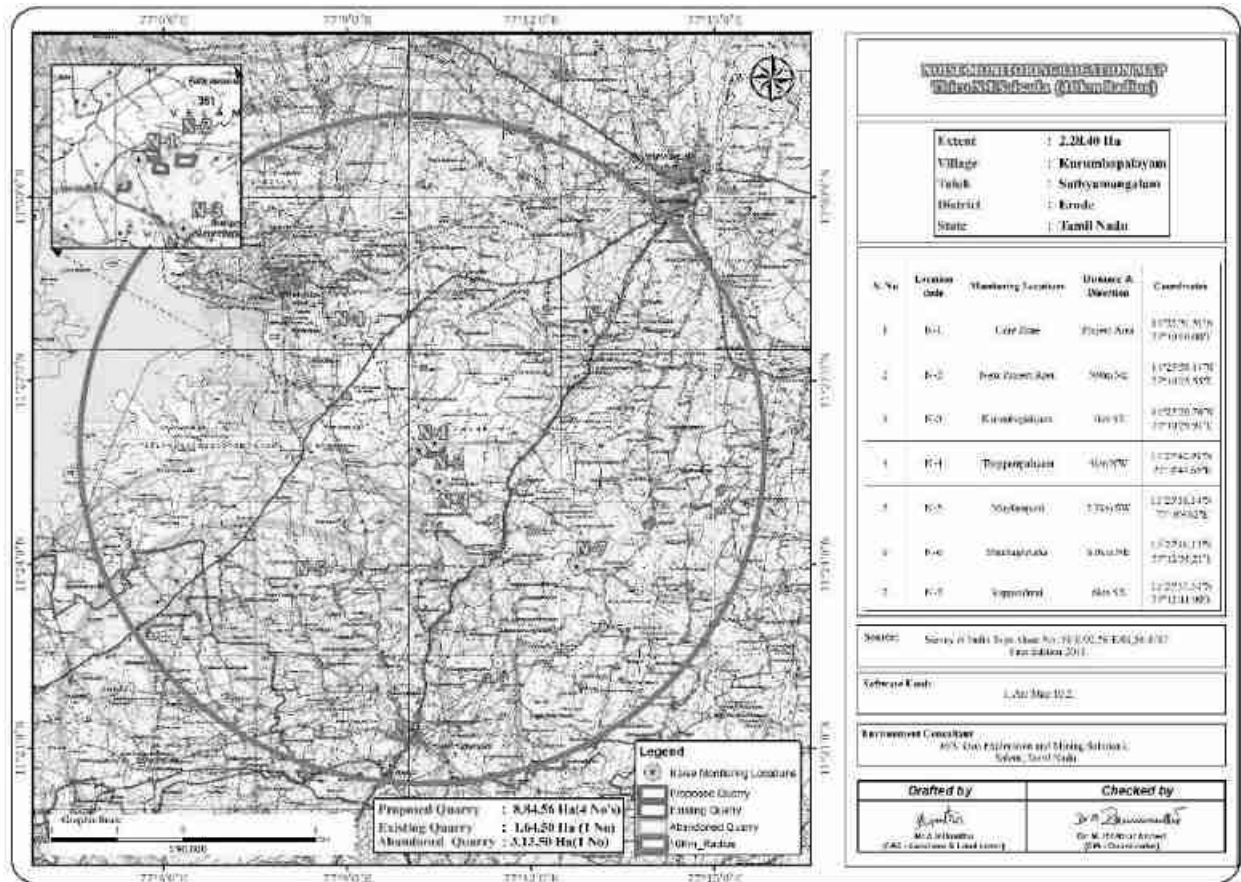
$$Leq = 10 \log L / T \sum (10L_n/10)$$

Where L = Sound pressure level at function of time dB (A)

T = Time interval of observation

Measured noise levels, displayed as a function of time, is useful for describing the acoustical climate of the community. Noise levels recorded at each station with a time interval of about 60minutes are computed for equivalent noise levels. Equivalent noise level is a single number descriptor for describing time varying noise levels.

**FIGURE 3.19: NOISE MONITORING STATIONS AROUND 10 KM RADIUS**



**3.4.3 Analysis of Ambient Noise Level in the Study Area**

The Digital Sound pressure level has been measured by a sound level meter (Model: HTC SL-1352)

An analysis of the different Leq data obtained during the study period has been made. Variation was noted during the day-time as well as night-time. The results are presented in below Table 3.32.

Day time: 6:00 hours to 22.00 hours.

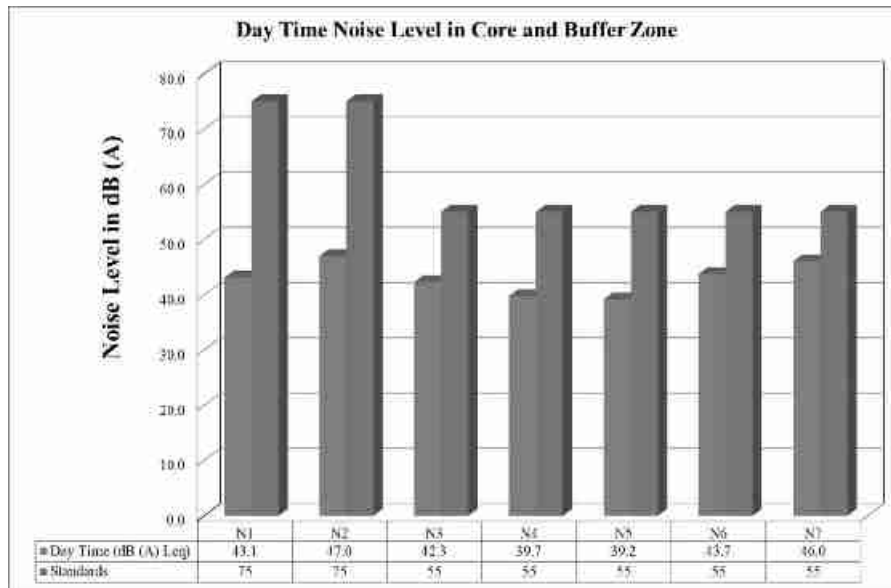
Night time: 22:00 hours to 6.00 hours.

**TABLE 3.22: AMBIENT NOISE QUALITY RESULT**

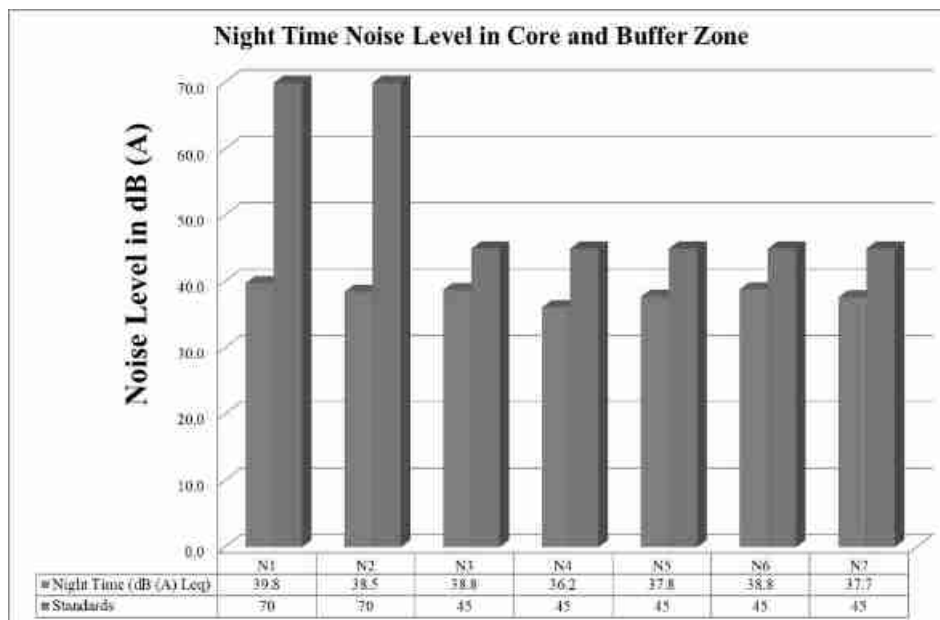
| S. No | Locations         | Noise level (dB (A) Leq) |            | Ambient Noise Standards  |
|-------|-------------------|--------------------------|------------|--|
|       |                   | Day Time                 | Night Time |  |
| 1     | Core Zone         | 47.5                     | 39.8       | <b>Industrial</b><br>Day Time- 75 dB (A)<br>Night Time- 70 dB (A)  |
| 2     | Near Project Area | 47.0                     | 38.5       |  |
| 3     | Kurumbapalayam    | 42.3                     | 38.7       |  |
| 4     | Thoppampalayam    | 39.7                     | 36.2       |  |
| 5     | Mayilampatti      | 39.2                     | 37.8       | <b>Residential</b><br>Day Time- 55 dB (A)<br>Night Time- 45 dB (A) |
| 6     | Shenbagapudur     | 43.7                     | 38.9       |  |
| 7     | Kuppandurai       | 46.0                     | 37.6       |  |

Source: On-site monitoring/sampling by EHS 360 Labs Private Limited in association with GEMS

**FIGURE 3.20: DAY TIME NOISE LEVELS IN CORE AND BUFFER ZONE**



**FIGURE 3.21: NIGHT TIME NOISE LEVELS IN CORE AND BUFFER ZONE**



**3.4.4 Interpretation & Conclusion:**

Ambient noise levels were measured at 7 (Seven) locations around the proposed project area. Noise levels recorded in core zone during day time were from 47.5dB (A) Leq and during night time were from 39.8dB (A) Leq. Noise levels recorded in buffer zone during day time were from 39.2 to 47.0dB (A) Leq and during night time were from 36.2 to 38.9dB (A)Leq. Thus, the noise level for Industrial and Residential area meets the requirements of CPCB.



### **3.5. Biological Environment**

#### **3.5.1. Study area Ecology**

The core area extent of 2.28.40 Ha of Rough stone and gravel quarry has an impact on diversity of flora and fauna of the surrounding area. But present work was carried out on detailed study of the impacts of Rough stone and gravel quarry on the ecology and biodiversity of the core lease area with the proper mitigation and sustainable management plan. The proposed mine lease area is plain terrain. The following methods were applied during the baseline study of flora, fauna, and diversity assessment.

#### **3.5.2. Objectives of Biological Studies**

- a) To study the likely impact of the proposed mining project on the local biodiversity and to suggest mitigation measures, if required, for vulnerable biota.
- b) Undertake intensive field survey to assess the status of floral & faunal component in different habitats in the core and buffer areas of the project site.
- c) Identification and listing of flora and fauna which are important as per the Wildlife (Protection) Act 1972.
- d) Suggest Wildlife conservation (species specific/habitat specific) and management plan for the threatened (critically endangered & endangered species - schedule I) faunal species if any reported within the study area.
- e) To identify the impacts of mining on agricultural lands and how it affects.
- f) Proper collection of information about wildlife Sanctuaries/ national parks/ biosphere reserves of the project area.
- g) Devise management & conservation measures for biodiversity.

#### **3.5.3. Methodology of Sampling**

Primary survey was conducted with established and accepted ecological methods in different habitats of study area. The field data collection mainly included biodiversity status assessment of different life forms habit of flora elements such as Trees, Shrubs, Climbers Herbs and Grass. Faunal diversity was assessed by inventorying the taxonomical groups like Mammals, Herpetofauna, birds and butterflies.

Nocturnal faunal species were searched by locating their calls during night time and by searching along the forest shrubs areas, dense dry bushes, below the stones, water bodies. During the study, to know more about the seasonal presence of flora and faunal species, information was obtained from local people and forest department.

Identification of vegetation in relation to the natural flora and crops was conducted through reconnaissance field surveys and onsite observations in core and buffer zone. The plant species identification was done based on the reference materials and also by examining the morphological characteristics and reproductive materials i.e. flowers, fruits and seeds. Land use pattern in relation to agriculture crop varieties were identified through physical verification of land and interaction with local villagers.

Plot method is used in the floral documentation in the core and buffer zone. For trees (10x10-m), shrubs (5x5-m) and herbs (1x1-m) plots were taken. Birds and butterflies were mainly focused during faunal assessment, transect method was employed for birds and butterflies. Transect is a path along which one counts and records the occurrence of an individual for study. A straight-line walk covering desired distance, within a time span of one hour to 30 minutes was carried out in the proposed region. Bird species were recorded during the hours of peak activity. 0700 to 1100 Hrs and 1430 to 1730 Hrs (Bibby et al. 2000).

Direct observations and bird calls were used for bird documentation. Same transects were used for counting butterflies. Opportunistic observations were made for Amphibians, reptiles and ordinales. Presence of mammals was recorded by direct and indirect signs. All possible transects were taken for birds and butterflies. Birds and butterflies were classified into species level. Recorded bird species were identified to species level using standard books (Ali & Ripley 1987, Grimmett et al., 2016).

**The secondary baseline data of flora and fauna has been complied through the following data sources:**

1. Forest working plan
2. Schedule I to V: Indian Wildlife (Protection) Act, 1972
3. Vivek Menon, Indian Mammals: A Field Guide. Hachette Book publishing India Pvt.Ltd., India.
4. Daniel J.C. The Book of Indian Reptiles and Amphibians, Bombay Natural History Society., India.
5. Ali, S and Ripley. handbook of the Birds of India and Pakistan together with those of Nepal, Sikkim and Bhutan, Oxford University Press, Bombay.
6. ENVIS Centre on Wildlife and Protected Area.
7. Birds Life Data Zone
8. Ebird.org
9. Global Biodiversity Information Facility

### **3.5.3.1 Sampling**

A stratified simple random sampling procedure was employed to obtain a sample from study area. The study area was further stratified in different land use/ecosystems.

#### **3.5.3.1.1. Sampling Size**

Keeping in mind both random sampling technique and covering all land use patterns for the study following sampling locations were chosen depending up on the area of the proposed site.

#### **3.5.3.3. Timing of Study**

The study was carried out during morning and evening hours, to cover the different activity phases for important species such as time resting, feeding, hunting, and daily movements.

#### **3.5.4. Observations from Sampling**

The various observations relating to flora and fauna species are discussed in detail below, in separate sections.

#### **3.5.5. Field Equipment's/ References**

Following tools/equipment were used for conducting phytosociological study.

- Ballpoint pen, Field bags, Field notebooks, field shoes, gloves, GPS, Measuring tapes and scales, Plant cutters, packet lens, ropes etc.
- Canon Mark III Camera with 50-500mm lens– Snap shots taken
- Leica Binoculars (8x 20) to spot/identify species
- IUCN Red Data Book – <https://www.iucnredlist.org/species>

Ornithological/Entomological/Herpetological/Mammalian catalogues and pictorial descriptions from various authors and websites are followed for species identification.

### **3.5.6. Part I Field Sampling Techniques (Fauna Sampling)**

#### **3.5.6.1. Transect walk – Birds**

Five no transect lines with varying length (100m-300m) and fixed width (2m) were laid which cuts through the core and buffer areas of proposed site. The transect surveys were conducted from 0700 to 1100Hrs and 1430 to 1730Hrs (Bibby et al. 2000). All avifauna found along these transects were recorded for analysing the data. Counts were conducted while there is no heavy rain, mist or strong wind.

### 3.5.6.2. Modified Pollard Walk – for Butterflies

The Modified Pollard Walk (Pollard 1977, 1993, Walpole 1999) using fixed width transect walk method were employed to investigate butterfly spatial distribution, diversity and abundance at the different survey sites.

### 3.5.6.3. Visual Encounter Survey (VES) - reptiles and Amphibians

VES is a time-constrained sampling technique (Campbell and Christman, 1982; Corn and Bury, 1990). It needs a systematic search through an area or habitat for a prescribed time period (Campbell and Christman, 1982). The result of VES is measured against the time spent on search. VES technique is one of the simplest methods, and an appropriate technique for both inventory and monitoring Herpetofauna (Heyer et al. 1994).

### 3.5.6.4. Observational methods- Mammals

For the purpose of recording mammals, we used two different observational techniques: (1) direct observations, and (2) recording of occurrences like holes, markings, scats, hairs, and spines (Menon 2003). For identification confirmations, photographs with a scale reference were used, and locations were recorded using a portable GPS device. Indigenous knowledge particularly that of the locals, was occasionally employed to compile a preliminary list of species and/or aid in the recognition of indicators.

### 3.5.6.5. Multiple Stage Quadrat – Vegetation

A variety of habitat or vegetation structure variables were measured using the Multiple Stage Quadrat sampling protocol (Sykes and Horrill 1977). All of those areas were sampled, and the major corners were temporarily delineated with colored ribbons. Each site was identified in the field using a compass and clinometer, and the plot's latitude, longitude, and elevation were recorded using a handheld Global Positioning System (Garmin 12XL).

## 3.5.7. Flora

### 3.5.7.1. Flora Composition in the Core Zone

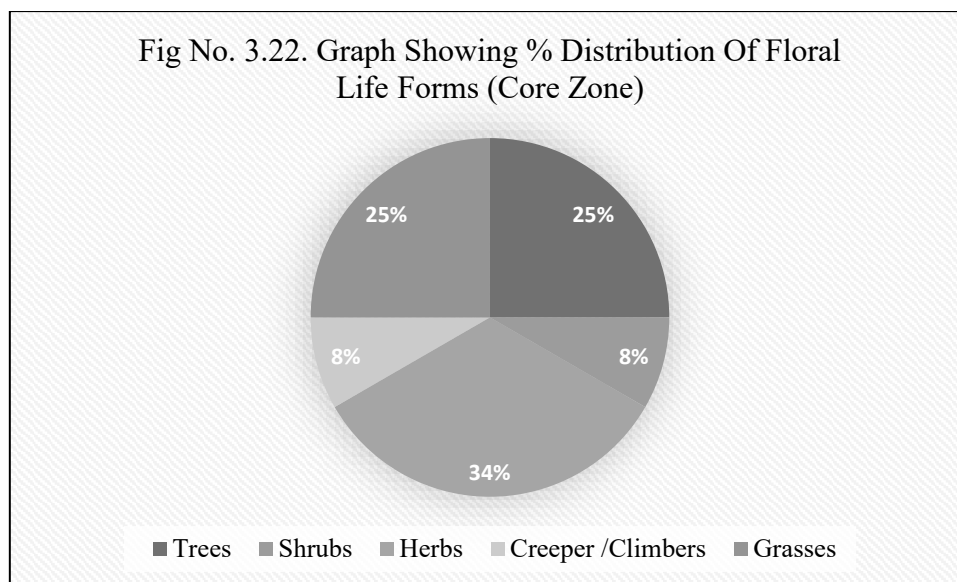
Core zone flora samplings were conducted between 10.00 am to 11.00 am in three locations. The lease applied area is plain terrain, we used with quadrat sampling methods. Taxonomically a total of 11 species belonging to 8 families have been recorded from the core mining lease area. Based on habitat classification of the enumerated plants the majority of species were Herbs 4, followed by Trees 3, Shrubs 1, Grasses 3, and Climbers/Creepers 1. Details of flora with the scientific name were mentioned in Table No. 3.53. The result of the core zone of flora studies shows that Fabaceae and Poaceae and Lamiaceae are the main dominating species in the study area mentioned in Table No.3.53. No species were found as a threatened category (Table No. 3.53).

**Table No: 3.23. Flora in the Core zone of Kurumbapalayam Village, Rough stone and Gravel quarry, Sathyamangalam Taluk, Erode District.**

| Sl. No        | English Name  | Vernacular Name | Scientific Name            | Family Name   |
|---------------|---------------|-----------------|----------------------------|---------------|
| <b>Trees</b>  |               |                 |                            |               |
| 1.            | Neem          | Vembu           | <i>Azadirachta indica</i>  | Meliaceae     |
| 2.            | Mesquite      | Mullu maram     | <i>Prosopis juliflora</i>  | Fabaceae      |
| 3.            | Pala indigo   | Pala maram      | <i>Wrightia tinctoria</i>  | Apocynaceae   |
| <b>Shrubs</b> |               |                 |                            |               |
| 1.            | Milk Weed     | Erukku          | <i>Calotropis gigantea</i> | Apocynaceae   |
| <b>Herbs</b>  |               |                 |                            |               |
| 1.            | Common leucas | Thumbai         | <i>Leucas aspera</i>       | Lamiaceae     |
| 2.            | Devil's thorn | Nerunji         | <i>Tribulus terrestris</i> | Zygophyllales |
| 3.            | Indian doab   | Arugampul       | <i>Cynodon dactylon</i>    | Poaceae       |
| 4.            | Coat buttons  | Thatha poo      | <i>Tridax procumbens</i>   | Asteraceae    |

| Creepers /Climbers |              |           |                              |          |
|--------------------|--------------|-----------|------------------------------|----------|
| 1                  | Stemmed vine | Perandai  | <i>Cissus quadrangularis</i> | Vitaceae |
| Grasses            |              |           |                              |          |
| 1.                 | Eragrostis   | Pullu     | <i>Eragrostis ferruginea</i> | Poaceae  |
| 2.                 | Great brome  | Thodappam | <i>Bromus diandrus</i>       | Poaceae  |
| 3.                 | Nut grass    | Korai     | <i>Cyperus rotandus</i>      | Poaceae  |

Sources: Species observation in the field study



The trees surveys were conducted around 300m radius from the proposed project site cluster are of Kurumbapalayam village. This is the standard scientific method followed by various workers in respect of phytosociological studies (Cottom and Curtis 1956; Ralhan et al. 1982; Saxena and Sing 1982; Nayak et al. 2000; Lu et al. 2004; Nautiyal 2008). While sampling, circumference at breast Height (CBH) of tree species was measured at 1.37m from ground level, along with the name of the species, phenology (flowering, fruiting, and flushes), and uses. After surveying areas, a detailed trees inventory has been compiled. A list of all plants from the study area was prepared and their habitats were recorded. The species of trees were documented during this base line survey. The dominant plant species growing in this area were *Cocos nucifera* *Prosopis juliflora*, etc. Please refer the Table No.3.54.

**Table No: 3.24. Tree survey around 300m radius from the proposed project site (Primary data)**

| S. No        | English Name      | Vernacular Name | Scientific Name              | No of trees |
|--------------|-------------------|-----------------|------------------------------|-------------|
| <b>Trees</b> |                   |                 |                              |             |
| 1.           | Acacia Nilotica   | Karuvelammaram  | <i>Vachellianilotica</i>     | 8           |
| 2.           | Mesquite          | Mullumaram      | <i>Prosopis juliflora</i>    | 45          |
| 3.           | Neem              | Vembu           | <i>Azadirachta indica</i>    | 23          |
| 4.           | White Bark Acacia | Vela maram      | <i>Vachellia leucophloea</i> | 14          |
| 5.           | Coconut           | Thennai maram   | <i>Cocos nucifera</i>        | 6           |

(Sources: Species observation in the field study)

**Table No: 3.25. Flora in the Buffer zone of Kurumbapalayam Village, Rough stone and Gravel quarry, Sathyamangalam Taluk, Erode District.**

| Sl.No.       | English Name          | Vernacular Name | Scientific Name              | Resource use type<br>*(E,M,EM) |
|--------------|-----------------------|-----------------|------------------------------|--------------------------------|
| <b>Trees</b> |                       |                 |                              |                                |
| 1.           | Millettia pinnata     | Pongam oiltree  | <i>Pongamia pinnata</i>      | E                              |
| 2.           | Tamarind              | Puliyamaram     | <i>Tamarindus indica</i>     | EM                             |
| 3.           | Asian Palmyra palm    | Panai maram     | <i>Borassus flabellifer</i>  | E                              |
| 4.           | Wild Date Palm        | Pericham        | <i>Phoenix sylvestris</i>    | E                              |
| 5.           | Coconut               | Thennai maram   | <i>Cocos nucifera</i>        | EM                             |
| 6.           | River tamarind        | Savunda         | <i>Leucaenaleucocephala</i>  | E                              |
| 7.           | Indian siris          | Vaagai          | <i>Albizia lebbek</i>        | E                              |
| 8.           | Lemon                 | Ezhumuchaipalam | <i>Citrus lemon</i>          | EM                             |
| 9.           | Mango                 | Manga           | <i>Mangifera indica</i>      | E                              |
| 10.          | Banyan tree           | Alamaram        | <i>Ficus benghalensis</i>    | E                              |
| 11.          | Common jujube         | Elanthai        | <i>Zizyphus jujuba</i>       | M                              |
| 12.          | Neem or Indian lilac  | Vembu           | <i>Azadirachta indica</i>    | M                              |
| 13.          | Creamy Peacock flower | Vadanarayani    | <i>Delonix elata</i>         | M                              |
| 14.          | Mesquite              | Sema Karuvelam  | <i>Prosopis juliflora</i>    | E                              |
| 15.          | Beauty leaf           | Punnai          | <i>Calophyllu inophyllum</i> | M                              |
| 16.          | Madras Thorn          | Kodukapuli      | <i>Pithecellobium dulce</i>  | E                              |
| 17.          | Castor oil plant      | Amanakku        | <i>Ricinus communis</i>      | M                              |
| 18.          | Gum arabic tree       | Karuvelam       | <i>Acacia nilotica</i>       | NE                             |
| 19.          | Flame-of-the-forest   | Neruppu Kondrai | <i>Delonix regia</i>         | E                              |
| 20.          | False ashoka          | Asoka maram     | <i>Polyalthia longifolia</i> | E                              |
| 21.          | Mesquite              | Seemaikaruvelam | <i>Prosopis julifera</i>     | E                              |
| 22.          | Monkey pod tree       | Thungumoonchi   | <i>Samanea saman</i>         | E                              |
| 23.          | Orchid tree           | Cem-mantarai    | <i>Bauhinia variegata</i>    | E                              |
| 24.          | Bitter Albizia        | Arappu          | <i>Albizia amara</i>         | M                              |
| 25.          | Giant thorny bamboo   | Perumungil      | <i>Bambusa bambos</i>        | M                              |
| 26.          | Wood-apple            | Vilamaram       | <i>Limonia acidissima</i>    | M                              |
| 27.          | Orange jessamine      | Venkarai        | <i>Murraya paniculata</i>    | E                              |
| 28.          | Singapore Cherry      | Thenpazham      | <i>Muntingia calabura</i>    | M                              |
| 29.          | Kassod Tree           | Manjal Konnai   | <i>Cassia siamea</i>         | M                              |
| 30.          | Black plum            | Navalmaram      | <i>Sygygium cumini</i>       | EM                             |
| 31.          | Eucalyptus            | Eucalyptus      | <i>Eucalyptus globules</i>   | EM                             |
| 32.          | Custard apple         | Seethapazham    | <i>Annona squamosa</i>       | E                              |

|               |                     |                       |                                   |    |
|---------------|---------------------|-----------------------|-----------------------------------|----|
| 33.           | Copperpod           | Iyal Vaagai           | <i>Copperpod</i>                  | E  |
| 34.           | Acacia Nilotica     | Karuvelam maram       | <i>Vachellia nilotica</i>         | M  |
| 35.           | Indian gooseberry   | Nelli                 | <i>Emblica officinalis</i>        | EM |
| 36.           | Henna               | Marudaani             | <i>Lawsonia inermis</i>           | EM |
| 37.           | Sacred fig          | Arasan                | <i>Ficus religiosa</i>            | E  |
| 38.           | Indian mulberry     | Nuan                  | <i>Morinda tinctoria</i>          | E  |
| 39.           | Teak                | Thekku                | <i>Tectona grandis</i>            | E  |
| 40.           | Papaya              | Pappali maram         | <i>Carica papaya</i>              | EM |
| 41.           | Yellow Orchid Tree  | Thiruvathi            | <i>Bauhinia tomentosa</i>         | E  |
| 42.           | Indian cork tree    | Maramalli             | <i>Millingtonia hortensi</i>      | E  |
| 43.           | Peepal              | Arasanmaram           | <i>Ficus religiosa</i>            | M  |
| 44.           | Indian fir tree     | Nettilinkam           | <i>Polylathia longifolia</i>      | E  |
| 45.           | Guava               | Koyya                 | <i>Psidium guajava</i>            | EM |
| 46.           | Curry tree          | Velipparuthi          | <i>Murraya koenigii</i>           | EM |
| 47.           | Bamboo              | Moonghil              | <i>Bambusa bambo</i>              | E  |
| 48.           | Drumstick tree      | Murunga maram         | <i>Moringa oleifera</i>           | EM |
| 49.           | Indian almond       | Padam maram           | <i>Terminalia catappa</i>         | EM |
| 50.           | Mesquite            | Velikathan maram      | <i>Prosopis juliflora</i>         | M  |
| 51.           | Portia tree         | Poovarasam            | <i>Thespesia populnea</i>         | E  |
| <b>Shrubs</b> |                     |                       |                                   |    |
| 1.            | Avaram              | Avarai                | <i>Senna auriculata</i>           | M  |
| 2.            | Night shade plan    | Sundaika              | <i>Solanum torvum</i>             | EM |
| 3.            | Lantana             | Unnichedi             | <i>Lantana camara</i>             | M  |
| 4.            | Bellyache bush      | Kattamanaku           | <i>Jatropha gossypifolia</i>      | M  |
| 5.            | Rough cocklebu      | Ottarachedi           | <i>Xanthium strumarium</i>        | M  |
| 6.            | Triangular spruge   | Chaturakalli          | <i>Euphorbia antiquorum</i>       | NE |
| 7.            | Pinwheelflower      | Nanthivattai          | <i>Tabernaemontana divaricata</i> | M  |
| 8.            | Indian jujube       | Elanthai              | <i>Ziziphus mauritiana</i>        | M  |
| 9.            | Coffee senna        | Kattuttakarai         | <i>Senna occidentalis</i>         | M  |
| 10.           | Rosy Periwinkle     | Nithyakalyani         | <i>Cathranthus roseus</i>         | M  |
| 11.           | Chinese chaste tree | Nochi                 | <i>Vitex negundo</i>              | E  |
| 12.           | Bush Morning Glory  | Neyvelik Kattamanakku | <i>Ipomoea carnea</i>             | E  |
| 13.           | Yellow elder        | Manjarali             | <i>Tecoma stans</i>               | M  |
| 14.           | Chinese chastetree  | Nochi                 | <i>Vitex negundo</i>              | M  |
| 15.           | Water spinach       | Nalikal               | <i>Ipomoea aquatica</i>           | E  |
| 16.           | Indian Oleander     | Arali                 | <i>Nerium indicum</i>             | M  |
| 17.           | Shoe flower         | Chemparuthi           | <i>Hibiscu rosa-sinensis</i>      | EM |

|              |                             |                    |                                |    |
|--------------|-----------------------------|--------------------|--------------------------------|----|
| 18.          | Puriging nut                | Kattamanakku       | <i>Jatropha curcas</i>         | EM |
| 19.          | Columnar Cactus             | Sappathikalli      | <i>Cereus pterogonus</i>       | M  |
| 20.          | Thorn apple                 | Oomathai           | <i>Datura stramonium</i>       | E  |
| 21.          | Century plant               | Anaikathalai       | <i>Agave americana</i>         | M  |
| 22.          | Jackal jujube               | Soorai pazham      | <i>Ziziphus oenopolia</i>      | M  |
| 23.          | Prickly pear                | Nagathali          | <i>Opuntia dillenii</i>        | M  |
| 24.          | Chinese hibiscus            | Chembaruthi        | <i>Hibiscus rosa sinensis</i>  | M  |
| 25.          | Indian mallow               | Thuthi             | <i>Abutilon indicum</i>        | M  |
| 26.          | Flame of the Woods          | Idlipoo            | <i>Xoracoc cinea</i>           | M  |
| 27.          | Peacock Flower              | Mayil Kontai       | <i>Caesalpinia pulcherrima</i> | M  |
| 28.          | Datura metel                | Uumaththai         | <i>Datura metel</i>            | NE |
| 29.          | Milk Weed                   | Erukku             | <i>Calotropis gigantea</i>     | M  |
| 30.          | Cassava                     | Maravalli kizhangu | <i>Manihot esculenta</i>       | EM |
| 31.          | Hopbush                     | Virali             | <i>Dodonaea viscosa</i>        | E  |
| 32.          | Paper flower                | Kahitha poo        | <i>Bougainvillea glabra</i>    | M  |
| 33.          | Tiger nail                  | Eli verandi        | <i>Martynia annua</i>          | M  |
| <b>Herbs</b> |                             |                    |                                |    |
| 1.           | Prickly chaff flower        | Nayuruv            | <i>Achyranthes aspera</i>      | M  |
| 2.           | Tridax daisy                | Vectukaayapoond    | <i>Tridax procumbens</i>       | M  |
| 3.           | Indian Copperleaf           | Kuppaimeni         | <i>Acalypha indica</i>         | M  |
| 4.           | Indian doab                 | Arugampul          | <i>Cynodon dactylon</i>        | E  |
| 5.           | Indian Catmint Plant        | Pei viratti        | <i>Anisomeles malabarica</i>   | M  |
| 6.           | Cleome viscosa              | Nai kadugu         | <i>Celome viscosa</i>          | M  |
| 7.           | Porcupine flower            | Shemmuli           | <i>Barleria prionitis</i>      | E  |
| 8.           | Mexican Fireplant           | Paaperuki          | <i>Euphorbia heterophylla</i>  | M  |
| 9.           | Common Wireweed             | Arivalmanai poond  | <i>Sida acuta</i>              | M  |
| 10.          | Punarnava                   | Mukkirattai        | <i>Boerhaavia diffusa</i>      | EM |
| 11.          | Mexican prickly poppy       | Kudiyotti          | <i>Argemone mexicana</i>       | M  |
| 12.          | Common leucas               | Thumbai            | <i>Leucas aspera</i>           | M  |
| 13.          | Ban Tulsi                   | Melakai poond      | <i>Croton bonplandianus</i>    | M  |
| 14.          | Licorice weed               | Kallurukki         | <i>Scoparia dulcis</i>         | M  |
| 15.          | Chay root                   | Chaaya ver         | <i>Oldenlandia umbellata</i>   | M  |
| 16.          | Slender dwarf morning-glory | Vittunu-k-kiranti  | <i>Evolvulus alsinoides</i>    | M  |
| 17.          | Spiny amaranth              | Mullu keerai       | <i>Amaranthus spinosus</i>     | M  |
| 18.          | Cracker plant               | Tapas kaaya        | <i>Ruellia tuberosa</i>        | M  |
| 19.          | Flannel Weed                | Sida mutti         | <i>Sida cordifolia</i>         | M  |
| 20.          | Green amaranth              | Mulai keerai       | <i>Amaranthus viridis</i>      | M  |

|                         |                          |                   |                                  |    |
|-------------------------|--------------------------|-------------------|----------------------------------|----|
| 21.                     | Marsh barbel             | Neermulli         | <i>Hygrophila auriculata</i>     | M  |
| 22.                     | Yellow-fruit nightshade  | Kandakathirika    | <i>Solanum surattense</i>        | M  |
| 23.                     | Shameplant               | Thottachenunki    | <i>Mimosa pudica</i>             | M  |
| 24.                     | Common Purslane          | Paruppu keerai    | <i>Portulaca oleracea</i>        | M  |
| 25.                     | Water willow             | Kodakasalai       | <i>Justicia procumbens</i>       | M  |
| 26.                     | Threadstem carpetweed    | Parpatakam        | <i>Mollugo cerviana</i>          | M  |
| 27.                     | Perennial Water Primrose | Muyalkathu Ilai   | <i>Ludwigia perennis</i>         | M  |
| 28.                     | Node Flower              | Kumattikkirai     | <i>Allmania nodiflora</i>        | M  |
| 29.                     | Sessile Joyweed          | Ponnankanni       | <i>Alternanthera sessilis</i>    | M  |
| 30.                     | Asthma-plant             | Ammanpacharisi    | <i>Euphorbia hirta</i>           | M  |
| 31.                     | Pignut                   | Nattapoochedi     | <i>Hyptis suaveolens</i>         | M  |
| 32.                     | Holy basil               | Thulasi           | <i>Ocimum tenuiflorum</i>        | M  |
| 33.                     | Pink Blumea              | Suvatru mullangi  | <i>Blumea mollis</i>             | M  |
| 34.                     | Madagascar Periwinkle    | Nithykalyani Podi | <i>Catharanthus roseus</i>       | E  |
| 35.                     | Asian spiderflower       | Naaikaduku        | <i>Cleome viscosa L</i>          | M  |
| 36.                     | <i>Digeria muricata</i>  | Thoiya keerai     | <i>Digeria muricata</i>          | EM |
| 37.                     | Carrot grass             | Partiniyam        | <i>Parthenium hysterophorus</i>  | NE |
| 38.                     | Europeanblack nightshade | Manathakkali      | <i>Solanumnigrum</i>             | EM |
| 39.                     | Mountain knotgrass       | Thengaipoo kirai  | <i>Aerva lanata</i>              | M  |
| 40.                     | Ash Fleabane             | Puvangkuruntal    | <i>Vernonia cinerea</i>          | M  |
| 41.                     | Bindii                   | Nerunchi          | <i>Tribulus terrestris</i>       | M  |
| 42.                     | Fish poison              | Kolinchi          | <i>Tephrosia purpurea</i>        | M  |
| 43.                     | Tomato                   | Thakkali          | <i>Solanum lycopersicum</i>      | EM |
| 44.                     | False daisy              | Karisalankanni    | <i>Eclipta alba</i>              | M  |
| 45.                     | Chilli                   | Milakai           | <i>Capsicum annum</i>            | EM |
| 46.                     | Aloe                     | Katrashai         | <i>Aloe vera</i>                 | M  |
| 47.                     | Eggplant                 | Kathrikkai        | <i>Solanum melongena</i>         | EM |
| 48.                     | Coat buttons             | Thatha poo        | <i>Tridax procumbens</i>         | M  |
| 49.                     | Indian mint              | Karpura valli     | <i>Coleus amboinicus</i>         | EM |
| 50.                     | Aloe barbadensis         | Katrashai         | <i>Aloe vera</i>                 | EM |
| <b>Climber/ Creeper</b> |                          |                   |                                  |    |
| 1.                      | Stemmed vine             | Perandai          | <i>Cissus quadrangularis</i>     | M  |
| 2.                      | Wild bitter              | Pavarkai          | <i>Momordica charantia</i>       | EM |
| 3.                      | Pointed gourd            | Kovakkai          | <i>Trichosanthes dioica</i>      | EM |
| 4.                      | Balloon vine             | Mudakkathan       | <i>Cardiospermum helicacabum</i> | M  |
| 5.                      | Ivy gourd                | Kovai             | <i>Coccinia grandis</i>          | M  |
| 6.                      | Asian pigeonwings        | Sangu poo         | <i>Clitoria ternatea</i>         | M  |



|              |                        |                          |                              |    |
|--------------|------------------------|--------------------------|------------------------------|----|
| 7.           | Bottle Guard           | Sorakkai                 | <i>Lagenaria siceraria</i>   | EM |
| 8.           | Wild Water Lemon       | Siru Punaikkali          | <i>Passiflora foetida</i>    | M  |
| 9.           | Ground Spurge          | Sithrapaalavi            | <i>Euphorbia prostrata</i>   | EM |
| 10.          | Madras Pea Pumpkin     | Musu musu                | <i>Mukia maderaspatena</i>   | M  |
| <b>Grass</b> |                        |                          |                              |    |
| 1.           | Jungle rice            | Kuthirai vaalKattu arusi | <i>Echinochloa colona</i>    | NE |
| 2.           | Mauritian Grass        | Moongil pul              | <i>Apluda mutica</i>         | NE |
| 3.           | Swollen Windmill Grass | Kondai Pul               | <i>Chloris barbata</i>       | NE |
| 4.           | Needle Grass           | Thodappam                | <i>Aristida adscensionis</i> | E  |
| 5.           | Eragrostis             | Pullu                    | <i>Eragrostis ferruginea</i> | E  |
| 6.           | Needle Grass           | -                        | <i>Aristida funiculata</i>   | NE |
| 7.           | Windmill grass         | Chevvarakupul            | <i>Chloris barbata</i>       | NE |
| 8.           | Sugarcane              | Karumbu                  | <i>Saccharum</i>             | E  |

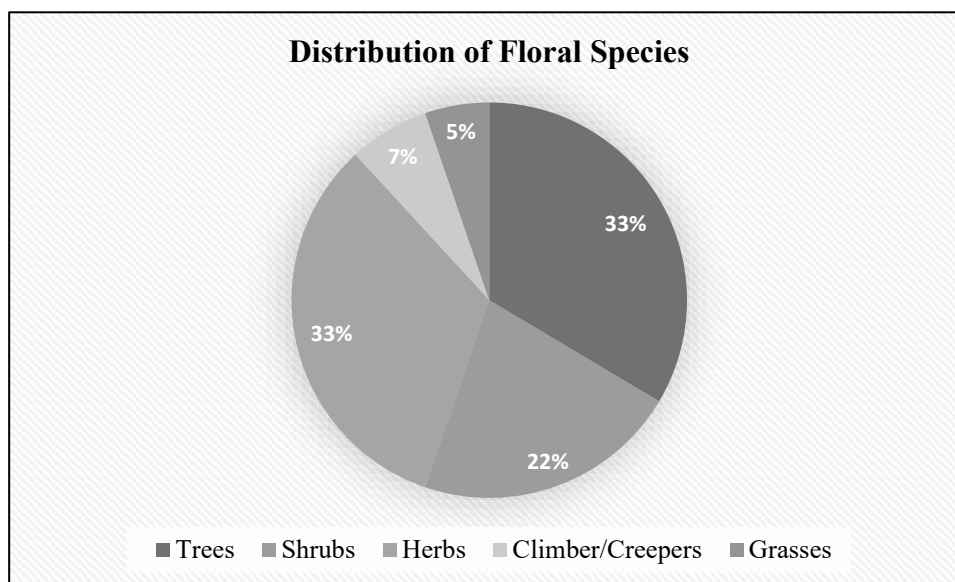
Sources: Species observation in the field study and secondary data

### 3.5.8. Flora Composition in the Buffer Zone

The Buffer zone flora samplings were conducted between 3.00 pm to 6.00 pm in different locations. Similar habitats may be found in the buffer area as well, although there is a wider variety of plants there than in the core zone area. Similar habitats may be found in the buffer area as well, although there is a wider variety of plants there than in the core zone area. The proposed project site there are 152 species in the buffer zone study area in total, based on records. The floral (152) varieties among them Trees 51, Herbs 50, Shrubs 33, Climbers/ Creepers 10, and Grasses 8, were identified. The result of the buffer zone of flora studies shows that Fabaceae and Cucurbitaceae, Euphorbiaceae is the main dominating species in the study area mentioned in Table No.3.55. There are no impacts due to this mining activity. There are no Rare, Endangered, and Threatened Flora species in the mining area and their surrounding study area. Apart from the proposed project area, there is agricultural land. Horticulture and agricultural land are untouched. There are no Rare, Endangered, and Threatened Flora species in the mining area and their surrounding study area. A list of floral species has been prepared based on primary survey (site observations) and discussion with local people. The total number of different plant life forms under trees, shrubs, herbs, and climbers is shown in Table No 3.55 and their % distribution is shown in Figure No 3.34.

**Table No 3.26: Number of floral life forms in the Study Area**

| S. No                | Plant Life Form  | Number of Species |
|----------------------|------------------|-------------------|
| 1                    | Trees            | 51                |
| 2                    | Shrubs           | 33                |
| 3                    | Herbs            | 50                |
| 4                    | Climber/Creepers | 10                |
| 6                    | Grasses          | 8                 |
| Total No. of Species |                  | 152               |



**Fig No. 3.23: Diagram showing % distribution of floral life forms**



a. *Calotropis gigantea*



b. *Azadirachta indica*



c. *Psidium guajava*



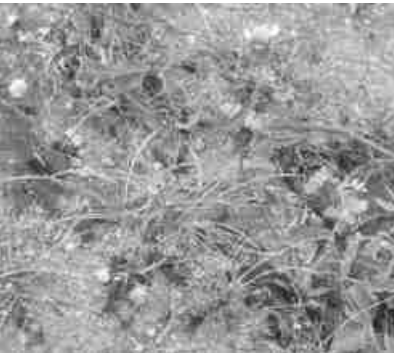
d. *Nerium indicum*



e. *Cissus quadrangularis*



f. *Annona reticulata*



g. *Tridax procumbens*



h. *Abutilon indicum*



i. *Tribulus terrestris*



j. *Tamarindus indica*



k. *Jatropha curcas*



l. *Leucas aspera*

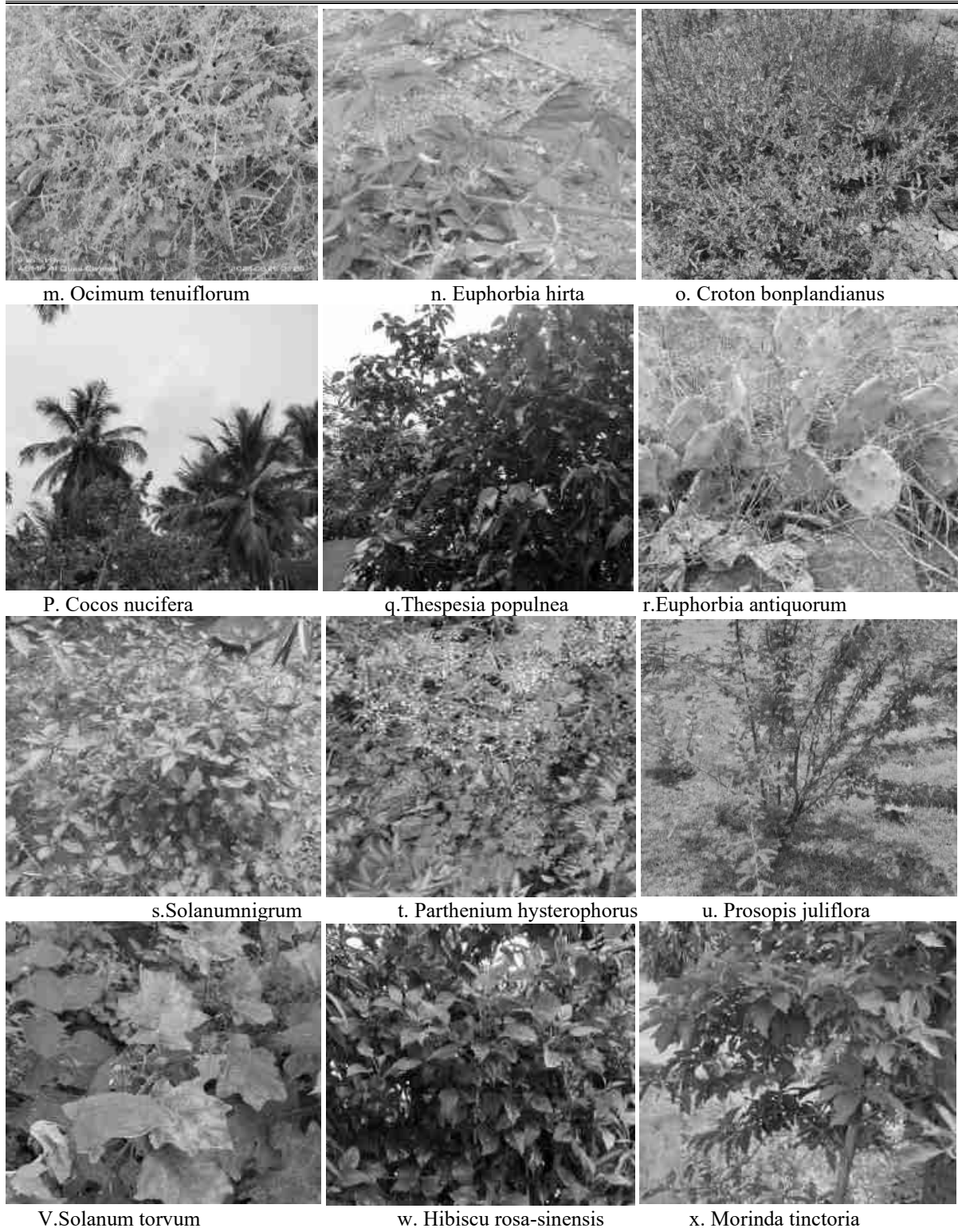


Fig No: 3.35. Flora species observation in the Buffer zone area

### 3.5.9. The vegetation in the RF / PF areas, ecologically sensitive areas

The Veeramalai Reserve Forest is located about 0.5km on the SW. No protected (PF) forests either in the mine lease area or in the buffer zone. Thus, no forest land is involved in any manner. Hence, no certificate from the Forest department is required. There are no impacts due to this mining activity.

There are no protected or ecologically sensitive areas such as National parks or Important Bird Areas (IBAs), or Wetlands or migratory routes of fauna or water bodies or human settlements within the proposed mine lease area. The Kadavur Slender Loris Sanctuary is located about 30.0km on the SW and Karaivetti Bird Sanctuary is located about 67.0km on the NE. There are no Biosphere reserves or wildlife sanctuaries or National parks or Important Bird Areas (IBAs), or migratory routes of fauna. Thus, the area under study (Mine lease area and the 10 Km buffer zone) is not ecologically sensitive. It is away from the proposed project site.

There are neither forests nor forest dwellers nor 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.

### 3.6. Fauna

The faunal survey has been carried out as per the methodology cited and listed out Mammals, birds, Reptiles, Amphibians, and Butterflies. All the listed species were compared with the Red Data Book and the Indian Wildlife Protection Act, 1972. There are no rare, endangered, threatened (RET), and endemic species present in the core area.

#### 3.6.1. Fauna Composition in the Core Zone

Core zone flora samplings were conducted between 10.00 am to 11.00 am in three locations. A total of 23 varieties of species were observed in the Core zone of Kurumbapalayam Village, Rough stone and gravel quarry (Table No.3.57) among them numbers of Insects 7, Reptiles 5, Mammals 3 and Avian 8. A total of 23 species belonging to 10 families have been recorded from the core mining lease area. None of these species are threatened or endemic in the study area and surroundings. There is no Schedule I species and thirteen species are under schedule IV according to the Indian wild life Act 1972. A total of 8 species of bird were sighted in the mining lease area. There are no critically endangered, endangered, vulnerable and endemic species were observed. Details of fauna in core zone with the scientific name were mentioned in Table No. 3.57.

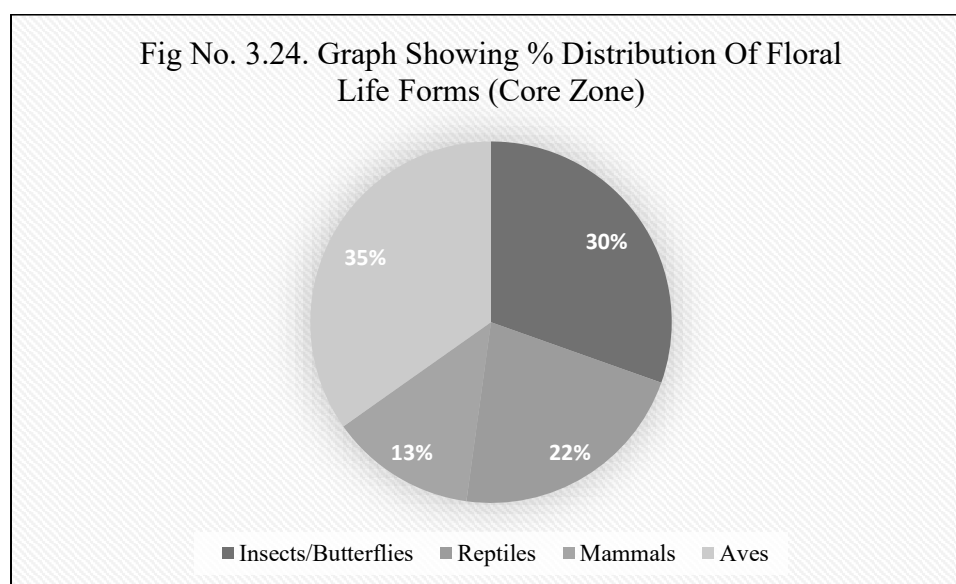
There are no critically endangered, endangered, vulnerable and endemic species were observed. Details of fauna in core zone with the scientific name were mentioned in Table No. 3.57.

**Table No: 3.27. Fauna in the Core zone of Kurumbapalayam Village, Rough stone and Gravel quarry, Sathyamangalam Taluk, Erode District**

| SI. No                     | Common Name            | Scientific Name               | Schedule list WLPC 1972 |
|----------------------------|------------------------|-------------------------------|-------------------------|
| <b>Insects/Butterflies</b> |                        |                               |                         |
| 1.                         | Common Tiger           | <i>Danaus genutia</i>         | NL                      |
| 2.                         | Red-veined darter      | <i>Sympetrum fonscolombii</i> | NL                      |
| 3.                         | Tawny coster           | <i>Danaus chrysippus</i>      | Schedule IV             |
| 4.                         | Dragonfly              | <i>Agriansp</i>               | -                       |
| 5.                         | Striped tiger          | <i>Danaus plexippus</i>       | Schedule IV             |
| 6.                         | Grey pansy             | <i>Junonia atlites</i>        | LC                      |
| 7.                         | Common Tiger           | <i>Danaus genutia</i>         | LC                      |
| <b>Reptiles</b>            |                        |                               |                         |
| 1.                         | Oriental garden lizard | <i>Calotes versicolor</i>     | NL                      |
| 2.                         | Green vine snake       | <i>Ahaetulla nasuta</i>       | Schedule IV             |
| 3.                         | Rat snake              | <i>Ptyas mucosa</i>           | Sch IV (Part II)        |

|                |                      |                                  |                    |
|----------------|----------------------|----------------------------------|--------------------|
| 4.             | Indian forest skink  | <i>Sphenomorphus indicus</i>     | NL                 |
| 5.             | House lizards        | <i>Hemidactylus flaviviridis</i> | Schedule IV        |
| <b>Mammals</b> |                      |                                  |                    |
| 1.             | Indian Field Mouse   | <i>Mus booduga</i>               | Schedule IV        |
| 2.             | Asian Small Mongoose | <i>Herpestes javanicus</i>       | Schedule (Part II) |
| 3.             | Squirrel             | <i>Funambulus palmarum</i>       | Schedule IV        |
| <b>Aves</b>    |                      |                                  |                    |
| 1.             | Rose-ringed parakeet | <i>Psittacula krameri</i>        | Schedule IV        |
| 2.             | Common myna          | <i>Acridotheres tristis</i>      | Schedule IV        |
| 3.             | Blue-rock pigeon     | <i>Colombalivia</i>              | Schedule IV        |
| 4.             | Pond heron           | <i>Ardeolagravi</i>              | Schedule IV        |
| 5.             | Asian koel           | <i>Eudynamysscolopacea</i>       | Schedule IV        |
| 6.             | Koel                 | <i>Eudynamys</i>                 | Schedule IV        |
| 7.             | Black drongo         | <i>Dicrurus macrocercus</i>      | Schedule IV        |
| 8.             | House crow           | <i>Corvus splendens</i>          | Schedule V         |

(Sources: Species observation in the field study)



### 3.6.2. Fauna Composition in the Buffer Zone

The Buffer zone fauna samplings were conducted between 3.00 pm to 6.00 pm in different locations. As animals, especially vertebrates move from place to place in search of food, shelter, mate or other biological needs, separate lists for core and buffer areas are not feasible however, a separate list of fauna pertaining to core and buffer zone are listed separately. Though there are no reserved forests in the buffer zone. As such there are no chances of occurrence of any rare or endangered or endemic or threatened (REET) species within the core or buffer area.

There are no Sanctuaries, National Parks, Tiger Reserve or Biosphere reserves or Elephant Corridor or other protected areas within 10 km radius of from the core area. It is evident from the available records, reports, and circumstantial evidence that the entire study area including the core and buffer areas were free from any endangered animals. There were no resident birds other than common bird species such as Red-whiskered Bulbul, Asian Koel, House crow, Black drangos, Crows, Pond heron etc.

The list of Mammals (\*directly sighted animals & Secondary data) is given in table No.3.58. The list of bird species recorded during the field survey and literature from the study area are given in Table No 3.59. The list of reptilian species recorded during the field survey and literature from the study area is given in Table No 3.60. The list

of insect species recorded during the field survey and literature from the study area are given in Table No 3.61. The list of Butterflies species recorded during the field survey and literature from the study area are given in Table No 3.62. It is apparent from the list that none of the species either spotted or reported is included in Schedule I of the Wildlife Protection Act. Similarly, none of them comes under the REET category.

Taxonomically a total of 64 species recorded were from the buffer zone area. Based on habitat classification the majority of species were birds 29, followed by Butterflies 12, Reptiles 9, Insects 5, Mammals 5, and Amphibians 4. There are three Schedule II species, two species are under the schedule III and forty-seven species are under Schedule IV according to the Indian Wildlife Act 1972. A total of 29 species of bird were sighted in the study area. There are no critically endangered, endangered, vulnerable, and endemic species were observed. There are no impacts on nearby fauna species.

Dominant species are mostly birds, butterflies, and insects, and four amphibians was observed during the extensive field visit *Sphaerotheca breviceps*, *Euphyctis hexadactylus*, *Bufo melanostictus*, etc. There is no Schedule I Species in the study area. There are no critically endangered, endangered, vulnerable, and endemic species were observed.

**Table No 3.28. List of Fauna & Their Conservation Status,  
Mammals: (\*directly sighted animals & Secondary data)**

| SI. No | Scientific Name            | Common Name/English Name | Schedule list wildlife Protection act 1972 |
|--------|----------------------------|--------------------------|--|
| 1.     | <i>Rattus norvegicus</i>   | Brown rat                | Schedule IV                                |
| 2.     | <i>Funambulus palmarum</i> | Indian palm squirrel     | Schedule IV                                |
| 3.     | <i>Herpestes javanicus</i> | Asian Small Mongoose     | Schedule (Part II)                         |
| 4.     | <i>Lepus nigricollis</i>   | Indian hare              | Schedule (Part II)                         |
| 5.     | <i>Mus booduga</i>         | Indian Field Mouse       | Schedule IV                                |

**Table No 3.29. Listed birds (Primary & Secondary)**

| SI. No | Scientific Name               | Common Name/English Name | Schedule list wildlife Protection act 1972 |
|--------|-------------------------------|--------------------------|--|
| 1.     | <i>Turdoides striata</i>      | Jungle babbler           | Schedule IV                                |
| 2.     | <i>Saxicoloides fulicatus</i> | Indian robin             | Schedule IV                                |
| 3.     | <i>Eudynamis</i>              | Asian Koel               | Schedule IV                                |
| 4.     | <i>Bubulcus ibis</i>          | Cattle egret             | Schedule IV                                |
| 5.     | <i>Columbidae</i>             | Rock pigeon              | Schedule IV                                |
| 6.     | <i>Acridotheres tristis</i>   | Common myna              | Schedule IV                                |
| 7.     | <i>Corvus splendens</i>       | House crow               | Schedule V                                 |
| 8.     | <i>Pycnonotus cafer</i>       | Red Vented Bulbul        | Schedule IV                                |
| 9.     | <i>Merops orientalis</i>      | Small Bee Eater          | Schedule IV                                |
| 10.    | <i>Cinnyris asiaticus</i>     | Purple sunbird           | Schedule IV                                |
| 11.    | <i>Hierococcyx varius</i>     | Common hawk-cuckoo       | Schedule IV                                |
| 12.    | <i>Passer domesticus</i>      | House sparrow            | Schedule IV                                |
| 13.    | <i>Alcedo atthis</i>          | Small blue Kingfisher    | Schedule IV                                |
| 14.    | <i>Psittacula krameri</i>     | Rose-ringed parakeet     | Schedule IV                                |
| 15.    | <i>Cypsiurus balasiensis</i>  | Asian Palm Swift         | Schedule IV                                |
| 16.    | <i>Coturnix coturnix</i>      | Common quail             | Schedule IV                                |
| 17.    | <i>Ardeola grayii</i>         | Pond herons              | Schedule IV                                |
| 18.    | <i>Dicrurus macrocerus</i>    | Black drongo             | Schedule IV                                |
| 19.    | <i>Picidae</i>                | Woodpecker bird          | Schedule IV                                |
| 20.    | <i>Ploceus philippines</i>    | Weaver bird              | Schedule IV                                |
| 21.    | <i>Dicrurus macrocerus</i>    | Two-tailed Sparrow       | Schedule IV                                |
| 22.    | <i>Dicrurus longicaudatus</i> | Grey drongo              | Schedule IV                                |

|     |                                  |                       |             |
|-----|----------------------------------|-----------------------|-------------|
| 23. | <i>Francolinus pondicerianus</i> | Grey Francolin        | Schedule IV |
| 24. | <i>Tringa glareola</i>           | Wood Sandpiper        | Schedule IV |
| 25. | <i>Merops philippinus</i>        | Blue-Tailed Bee Eater | Schedule IV |
| 26. | <i>Coracias benghalensis</i>     | Indian Roller         | Schedule IV |
| 27. | <i>Hirundo rustica</i>           | Common Swallow        | Schedule IV |
| 28. | <i>Orthotomus sutorius</i>       | Common Tailor Bird    | NL          |
| 29. | <i>Cinnyris asiaticus</i>        | Purple Sunbird        | NL          |

Reference: Ali, S. (2002). The Book of Indian Birds (13th revised edition). Oxford University Press, New Delhi. 326pp.

**Table No 3.30. List of Reptiles either spotted or reported from the study area.  
(\*indicates direct observations & Secondary data)**

| SI. No | Scientific Name                  | Common Name/English Name | Schedule list wildlife Protection act 1972 |
|--------|----------------------------------|--------------------------|--|
| 1.     | <i>Calotes versicolor</i>        | Oriental garden lizard   | NL   |
| 2.     | <i>Hemidactylus flaviviridis</i> | House lizards            | Schedule IV                                |
| 3.     | <i>Ahaetulla nasuta</i>          | Green vine snake         | Schedule IV                                |
| 4.     | <i>Ptyas mucosa</i>              | Rat snake                | Sch IV (Part II)                           |
| 5.     | <i>Bungarus caeruleus</i>        | Common krait             | Schedule IV                                |
| 6.     | <i>Mabuya carinatus</i>          | Common skink             | NL   |
| 7.     | <i>Vipera russeli</i>            | Russell's viper          | Sch II (Part II)                           |
| 8.     | <i>Nerodia piscator</i>          | Fresh water snake        | Sch III (Part II)                          |
| 9.     | <i>Groemyda bijuga</i>           | Fresh water tortoise     | Sch III (Part II)                          |

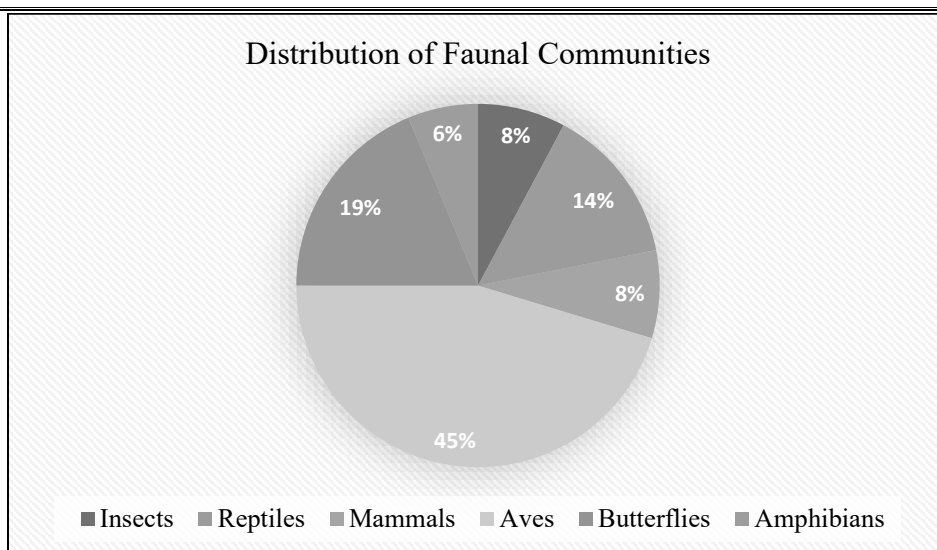
**Table No 3.31. List of insects either spotted or reported from the study area**

| SI. No | Scientific Name             | Common Name/English Name | Schedule list wildlife Protection act 1972 |
|--------|-----------------------------|--------------------------|--|
| 1.     | <i>Apis cerana</i>          | Indian honey bee         | -  |
| 2.     | <i>Hamitermes silvestri</i> | Termite                  | NE   |
| 3.     | <i>Hieroglyphus sp</i>      | Grasshopper              | NL   |
| 4.     | <i>Camponotus Vicinus</i>   | Ant                      | NL   |
| 5.     | <i>Ceratogomphus pictus</i> | Dragonfly                | -  |

**Table No.3.32. List of Butterflies reported from the study area**

| SI. No | Scientific Name                 | Common Name/English Name  | Schedule    |
|--------|---------------------------------|---------------------------|-------------|
| 1.     | <i>Suastusgremius</i>           | Indian palm bob           | Schedule IV |
| 2.     | <i>Papilio polytes</i>          | Common Mormon             | Schedule IV |
| 3.     | <i>Pachlioptaaristolochiaee</i> | Common rose               | Schedule IV |
| 4.     | <i>Eurema laeta</i>             | Spotless grass yellow     | Schedule IV |
| 5.     | <i>Danaus genutia</i>           | Common Tiger              | Schedule IV |
| 6.     | <i>Catopsiliapomona</i>         | Common emigrant           | Schedule IV |
| 7.     | <i>Colotisdanae</i>             | Crimson tip               | Schedule IV |
| 8.     | <i>Euploea core</i>             | Common Indian crow        | Schedule IV |
| 9.     | <i>Papilio demoleus</i>         | Lime Butterfly            | Schedule IV |
| 10.    | <i>Junonia hierta</i>           | Yellow Pansy              | Schedule IV |
| 11.    | <i>Junonia iphita</i>           | Chocolate Pansy           | Schedule IV |
| 12.    | <i>Euploea sylvester</i>        | Double-branded Black Crow | Schedule IV |



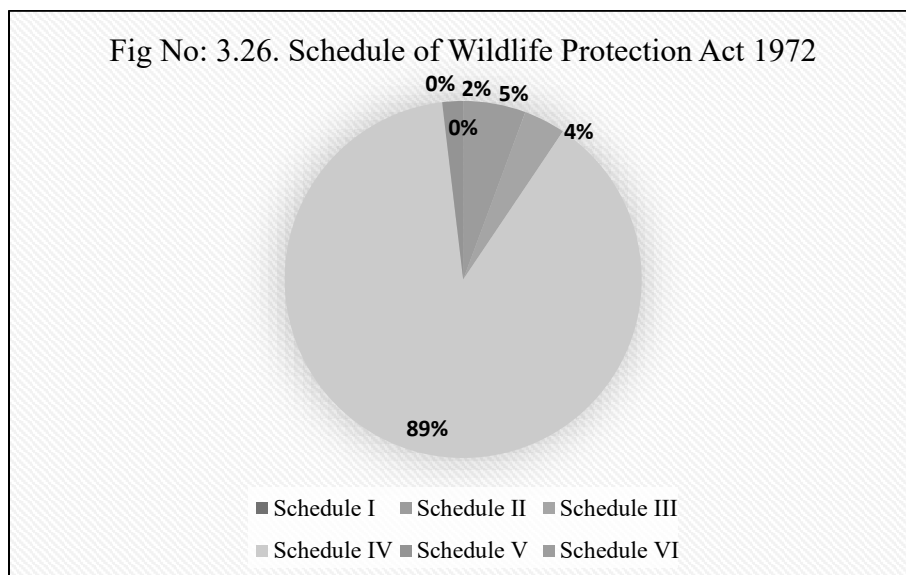


**Fig No: 3.25. Diagram showing % distribution of faunal life forms**

Livestock like cattle, buffalo, goat, poultry, duck and pig are reared for dairy products, meat, and egg and for agriculture purpose. Majority of cattle and buffalo are of local variety. Backyard poultry farms are mostly common in this area; however, some commercial poultry farms are also recorded in the study area. The study area is marked with moderate population of flora and fauna. With reference to the Wildlife Protection Act 1972 total number of wildlife tabulated in this study can be characterized as given in the Table No 3.63.

**Table No: 3.33. Characterization of Fauna in the Study Area (As Per W.P Act, 1972)**

| S.No | Schedule of Wildlife Protection Act 1972 | No. of species | Remark |
|------|--|----------------|--------|
| 1.   | Schedule I                               | 0              | -      |
| 2.   | Schedule II                              | 3              | -      |
| 3.   | Schedule III                             | 2              | -      |
| 4.   | Schedule IV                              | 47             | -      |
| 5.   | Schedule V                               | 1              | -      |
| 6.   | Schedule VI                              | 0              | -      |



**Table No: 3.34. Description of Flora & Fauna**

| S.No         | Type of Species                    | Name                        | Local Name |
|--------------|------------------------------------|-----------------------------|------------|
| <b>Flora</b> |                                    |                             |            |
| 1.           | Endangered species                 | None                        | None       |
| 2.           | Threatened species                 | None                        | None       |
| 3.           | Near Threatened species            | None                        | None       |
| 4.           | Vulnerable species                 | None                        | None       |
| <b>Fauna</b> |                                    |                             |            |
| 5.           | Endangered species                 | None                        | None       |
| 6.           | Threatened species                 | None                        | None       |
| 7.           | Near Threatened species            | None                        | None       |
| 8.           | Vulnerable species                 | None                        | None       |
| 9.           | Migratory Corridors & Flight Paths | No corridors & flight paths | -          |
| 10.          | Breeding & Spawning grounds        | None                        | -          |

A comprehensive Central Legislation Namely Wild Life (Protection) Act was enforced in 1972 to provide protection to wild animals. Schedule-I of this act contains the list of rare and endangered species, which are completely protected throughout the country. The list of wild animals and their conservation status as per Wild Life Act (1972) presented in Table No 3.64 are the species recorded/reported from the study area, out of which 2 species belongs to schedule-II, 2 species belong to schedule-III, 1 species belongs to Schedule-V and rest of the species belongs to schedule-IV of Wildlife Protection Act, 1972. And there is no Invasive alien species (IAP) in the study area.

### 3.6.3. Aquatic Ecology

Mining activities will not have an impact on aquatic ecosystems because no effluent discharge from the Limestone mine is planned. There are no natural perennial surface water bodies, such as marshes, rivers, streams, lakes, or agricultural sites, inside the mining lease area. The study region contains a few seasonal water bodies located study area. There is no aquatic flora and, aquatic faun. Hence, it does not harbour any significant aquatic life. Therefore, the project is not likely to affect the aquatic ecology. Aquatic weeds are found to be growing everywhere in 10 km radius area, in every water bog, pond, etc. Typha angustata can be found growing all along the drains of villages, small water-logged depressions, and agricultural fields lacking water but containing enough moisture to support its growth. And where water is present, Eichhornia crassipes has taken its roots and covers the entire water surface by its sprawl and invasion.

#### 3.6.3.1. Objectives of Aquatic Studies

- ✓ Generating data through actual field collection in these locations over the study period.
- ✓ Impacts on aquatic fauna/flora
- ✓ Consulted with locals to obtain knowledge about aquatic flora and animals.

#### 3.6.3.2. Macrophytes

The macrophytes observed within the study area are tabulated in Table No 3.65.

**Table No.3.35. Description of Macrophytes**

| Sl.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 | Kottikizhnagu           | NA                                  |
| 3.    | <i>Nymphaea nouchali</i>  | Blue water lily     | Nellambal               | LC                                  |
| 4.    | <i>Typha angustifolia</i> | Sambu               | Narrowleaf cattail      | LC                                  |
| 5.    | <i>Carex cruciata</i>     | Cross Grass         | Koraipullu              | NA                                  |
| 6.    | <i>Cyperus exaltatus</i>  | Tall Flat Sedge     | Koraikizhangu           | LC                                  |

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**Sources: Species observation in the field study**


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**3.6.3.3. Aquatic Faunal Diversity**

Amphibian species like the common Indian Burrowing frog, and green pond frog, and etc. were sighted near the water bodies located in the study area.

**Table No. 3.36. Amphibians Observed/Recorded from the Study Area**

| SI. No | Scientific Name                | Common Name/English Name | Schedule list wildlife Protection act 1972 |
|--------|--------------------------------|--------------------------|--|
| 1.     | <i>Sphaerotheca breviceps</i>  | Indian Burrowing frog    | Schedule IV                                |
| 2.     | <i>Euphlyctis hexadactylus</i> | Green pond frog          | Schedule IV                                |
| 3.     | <i>Bufo melanostictus</i>      | Indian Toad              | Schedule IV                                |
| 4.     | <i>Euphlyctiscynophlyctis</i>  | Skipper                  | Schedule IV                                |

**3.6.3.4. Other Aquatic Fauna****3.6.3.4.1. Fishes**

The study area has low aquatic diversity, with few types of fish living. The species of fish reported during the primary visit are Rohu, Catla, Catfish, etc. Species of fish reported in the study area are given in Table No 3.67.

**Table No 3.37. Based on Actual Sighting, based on inputs from locals and Perused from Secondary Data**

| S.No | Scientific name           | Common name         | Family       |
|------|---------------------------|---------------------|--------------|
| 1.   | <i>Puntius sophore</i>    | Ponthia             | Cyprinidae   |
| 2.   | <i>Catla Catla</i>        | Catla               | Cyprinidae   |
| 3.   | <i>Lepidopus caudatus</i> | Silver scabbardfish | Trichiuridae |
| 4.   | <i>Siluriformes</i>       | Catfish             | -            |
| 5.   | <i>Labeo rohita</i>       | Rohu                | Cyprinidae   |

Sources: Species observation in the field study

**3.6.4. Findings/Results**

The assessment was carried out during the summer season. The inspection day was quite alright with respectable weather. The details of the flora and fauna observed are given below.

**Records of threatened species in the area**

No threatened species were observed

**Endangered Species as per Wildlife (Protection) Act**

No Endangered fauna was recorded in the project area.

**Endemic Species of the Project areas**

No endemic species were observed in the project area.

**Migratory species of the Project areas**

No migratory fauna observed in project area.

**Migratory corridors and Flight paths**

No migratory corridors and Flight paths were observed in project area.

**Breeding and spawning grounds**

No breeding and spawning grounds were earmarked for the wildlife fauna in project area.

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There are no critically endangered, endangered, vulnerable and endemic species were observed. As the rainfall in the area is scanty and as no toxic wastes are produced or discharged on account of mining, the proposed mining activity is not going to have any additional and adverse impacts on these RET species. There are no ecologically sensitive areas or protected areas within the 10 Km radius. Hence no specific conservation for conservation of any RET species or Wildlife is envisaged.

There are no National Parks, Sanctuaries, Biosphere Reserves, Wildlife Corridors, Ramsar sites, Tiger/Elephant Reserves/(existing as well as proposed) within 10 km of the mine lease area. There are no protected forests within the project area. Hence submission of clearance from the National Board of Wildlife does not arise.

There is no endangered, endemic and RET Species. There is no Schedule I species in study area [core zone and buffer zone (10 km radius of the periphery of the mine lease)] The proposed project is not going to have any direct or indirect adverse impact on the species mentioned above.

### **3.7. Conclusion**

The observations and assessment of the overall ecological scenario involve details such as classification of Biogeographic zone, eco-region, habitat types and land cover, distances from natural habitats, vegetation/forest types, and sensitive ecological habitats such as Wetlands sites, Important Bird areas, migration corridors of important wildlife etc. Such baseline information provides better understanding of the situation and overall ecological importance of the area. This baseline information viewed against proposed project activities help in predicting their impacts on the wildlife and their habitats in the region. Data collected and information gathered from secondary literature on flora, fauna, protected area, natural habitats, and wildlife species etc., and consulted and discussed with local people, from the villages, herders and farmers who inhabit close to the proposed project area.

### **3.6 SOCIO ECONOMIC ENVIRONMENT**

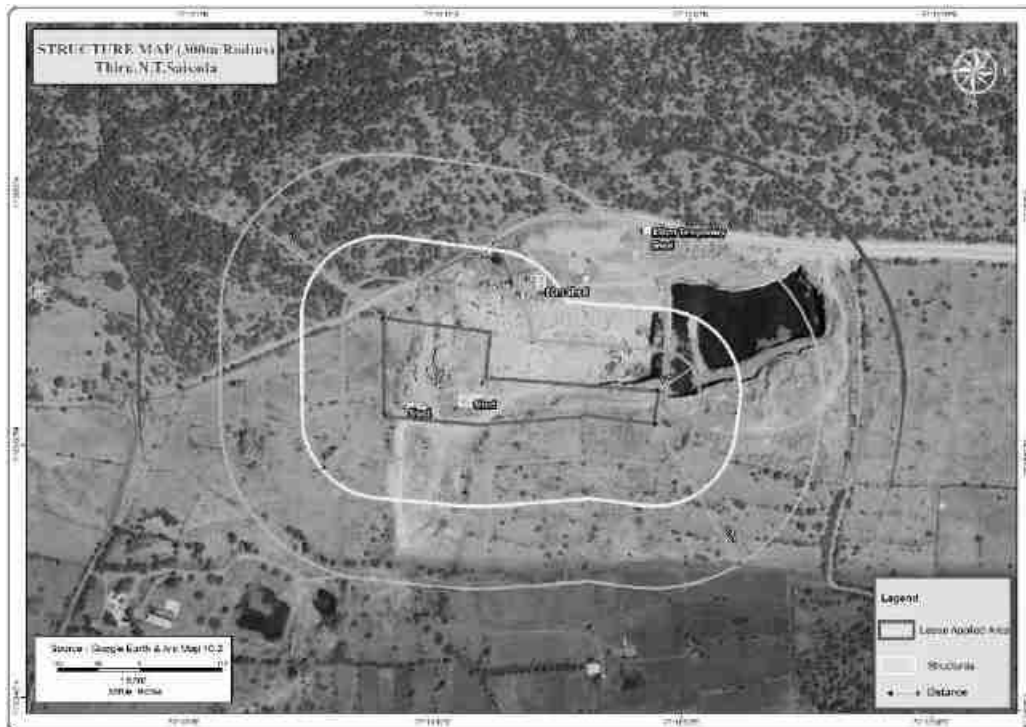
Socio-economic study is an essential part of environmental study. It includes demographic structure of the area, provision of basic amenities viz., housing, education, health and medical services, occupation, water supply, sanitation, communication, transportation, prevailing diseases pattern as well as feature like temples, historical monuments etc., at the baseline level. This will help in visualizing and predicting the possible impact depending upon the nature and magnitude of the project. It is expected that the Socio-Economic Status of the area will substantially improve because of this proposed project. As the proposed project will provide direct and indirect employment and improve the infrastructural facilities in that area and, thus, improve their standard of living.

#### **STRUCTURE STUDY IN 500m RADIUS**

There are few structures within the radius of 500m from the project site, the details of the structures are given below:

**TABLE 3.35: STRUCTURES IN 500m RADIUS**

| Structure Numbers | Distance & Direction from the project site | Structure Details and Usage Purpose | Type of Structure (Kutchha/ Brick/ Cement/ RCC/ Framed Structures) | No.of Occupants | Structure belongs to owner (Yes/No) | Remarks                                 |
|-------------------|--|-------------------------------------|--|-----------------|-------------------------------------|---|
| 1                 | Adjacent to lease area - South             | Shed                                | Sheet structure  | -               | Yes                                 | Used to store mines materials           |
| 2                 | Inside the lease area - South              | Shed                                | Sheet structure  | -               | Yes                                 |   |
| 3                 | 80m - North                                | Shed                                | Brick & Sheet structure  | 2 Nos           | Yes                                 |   |
| 4                 | 180m - NE                                  | Temporary Shed                      | Brick & Sheet structure  | 4 Nos           | Yes                                 | Labour used as a rest shelter – No Stay |

**FIGURE 3.26: STRUCTURE MAP 500m RADIUS**

### 3.6.1 Objectives of the Study

The objectives of the socio-economic study are as follows:

- To study the socio-economic status of the people living in the study area.
- To assess the impact of the project on Quality of life of the people in the study area.
- To recommend Community Development measures needs to be taken up in the study Area.

### 3.6.2 Scope of Work

- To study the Socio-economic Environment of the area from the secondary sources;
- Data Collection & Analysis
- Prediction of project impact
- Mitigation Measures

### 3.6.3 District Profile

Erode District lies on the extreme north of Tamil Nadu. It is bounded mostly by Karnataka State and also River Palar covers pretty long distance. To the East lies Namakkal and Karur Districts. Dindigal District is its

immediate neighbour to the South and on the West, it has Coimbatore and Nilgiri Districts, as its boundaries. Thus, Erode District is essentially a land-locked area having no sea-cost of its own. Erode District situated at between 10 36” and 11 58” North Latitude and between 76 49” and 77 58” East Longitude. <https://erode.nic.in/about-district/>

Now Erode District consists of 10 taluks viz., Erode, Modakkurichi, Kodumudi, Perundurai, Bhavani, Anthiyur, Gobichettipalayam, Sathyamangalam, Thalavadi and Nambiyur. There are 4 Municipalities in the district viz., Sathyamangalam, Bhavani, Gobichettipalayam, and Punjai Puliampatti. The other four Municipalities in the district viz. Periasemur, Kasipalayam, Surampatti and Veerappanchatram have been merged recently with Erode Corporation. There are 42 Town Panchayats, 230 Village Panchayats and 375 Revenue Villages. There are 14 Community Development Blocks in the district.

### Minerals

Though the district cannot boast of great mineral wealth, it has a few varied items of significance. Both opaque and translucent varieties of fine quality of Feldspar is found abundantly in Erode taluk. Mica and Muscovite occur in Vairamangalam near Bhavani and near Punjai Puliampatti respectively. Asbestos is found to occur in a few places of Bhavani and Perundurai. Doddan Combai forest in Gobichettipalayam is bestowed with rich iron ore. This ore is found to be of very fine quality and rich in metal. Traces of gold also have been found in a few auriferous veins in Gobichettipalayam.

### 3.6.4 Study area:

#### KURUMBAPALAYAM VILLAGE

Kurumbapalayam village is situated in Teshil Sathyamangalam, District Erode and in State of Tamil Nadu India. Village has population of 1521 as per census data of 2011, in which male population is 777 and female population is 744. Total geographical area of Kurumbapalayam village is 876.25 Hectares. Population density of Kurumbapalayam is 2 persons per Hectares. Total number of house hold in village is 441.

Census Data of Village Kurumbapalayam, Teshil Sathyamangalam, District Erode, India --Census 2011 Elathur Town Panchayat has total administration over 2,404 houses to which it supplies basic amenities like water and sewerage. It is also authorized to build roads within Town Panchayat limits and impose taxes on properties coming under its jurisdiction.

| Population | Area (Ha) | Density (P/Ha) | Sex Ratio | Literacy |
|------------|-----------|----------------|-----------|----------|
| 1          | 876.25    | 2              | 958       | 61.02%   |

Gram Panchayat name of the Kurumbapalayam village is Vinnappalli. CD Block name is Bhavanisagar and Teshil/Taluk or sub-district is Sathyamangalam. Data Reference year is 2009 of Census 2011. Sub District HQ Name is SATHYAMANGALAM and Sub District HQ Distance is 10 Km from the village. District Head Quarter name is ERODE and its distance from the village is 80KM. Nearest Town of the Kurumbapalayam village is PUNJAIPULIAMPATTI and nearest town distance is 8 km. Pincode of Kurumbapalayam village is 638402. As per census 2011 village code of village Kurumbapalayam is 634818.

#### Demographics Population of Village Kurumbapalayam, Teshil Sathyamangalam, District Erode

| Total Population | Male Population | Female Population |
|------------------|-----------------|-------------------|
| 1521             | 777             | 744               |

## Sex Ratio of Kurumbapalayam Village -Census 2011

As per the Census Data 2011 there are 958 Femals per 1000 males out of 1521 total population of village. There are 848 girls per 1000 boys under 6 years of age in the village.

## Literacy of Kurumbapalayam Village

Out of total poplation total 839 people in Kurumbapalayam Village are literate, among them 488 are male and 351 are female in the village. Total literacy rate of of Kurumbapalayam is 61.02%, for male literacy is 69.91% and for female literacy rate is 51.85%.

**TABLE 3.36: KURUMBAPALAYAM VILLAGE CENSUS 2011 DATA**

| Description                     | Census 2011 Data |
|---------------------------------|------------------|
| Village Name                    | Kurumbapalayam   |
| Teshil Name                     | Sathyamangalam   |
| District Name                   | Erode            |
| State Name                      | Tamil Nadu       |
| Total Population                | 1521             |
| Total Area                      | 876 (Hectares)   |
| Total No of House Holds         | 441              |
| Total Male Population           | 777              |
| Total Female Population         | 744              |
| 0-6 Age group Total Population  | 146              |
| 0-6 Age group Male Population   | 79               |
| 0-6 Age group Female Population | 67               |
| Total Person Literates          | 839              |
| Total Male Literates            | 488              |
| Total Female Literates          | 351              |
| Total Person Illiterates        | 682              |
| Total Male Illiterates          | 289              |
| Total Female Illiterates        | 393              |
| Scheduled Cast Persons          | 132              |
| Scheduled Cast Males            | 65               |
| Scheduled Cast Females          | 67               |
| Scheduled Tribe Persons         | 0                |
| Scheduled Tribe Males           | 0                |

Source: <https://etrace.in/census/village/kurumbapalayam-sathyamangalam-district-erode-tamil-nadu-634818/>

**Worker's profile of Kurumbapalayam Village**

Total working population of Kurumbapalayam is 954 which are either main or marginal workers. Total workers in the village are 954 out of which 511 are male and 443 are female. Total main workers are 822 out of which female main workers are 449 and male main workers are 373. Total marginal workers of village are 132.

**TABLE 3.37 KURUMBAPALAYAM WORKING POPULATION ---CENSUS 2011**

| <b>Workers</b>           | <b>Total</b> | <b>Male</b> | <b>Female</b> |
|--------------------------|--------------|-------------|---------------|
| Total Workers            | 954          | 511         | 443           |
| Main Workers             | 822          | 449         | 373           |
| Main Workers Cultivators | 422          | 289         | 133           |
| Agriculture Labourer     | 80           | 49          | 31            |
| Household Industries     | 20           | 8           | 12            |
| Other Workers            | 300          | 103         | 197           |
| Marginal Workers         | 132          | 62          | 70            |
| Non-Working Persons      | 567          | 266         | 301           |



**TABLE 3.38: POPULATION DATA OF STUDY AREA**

| Sno | Name                   | No of House Holds | Total Population | Male | Female | SC Population | ST Population | Total Literate Population | Male Literate | Female Literate |
|-----|------------------------|-------------------|------------------|------|--------|---------------|---------------|---------------------------|---------------|-----------------|
| 1   | Akkarainegamam         | 252               | 866              | 433  | 433    | 118           | 0             | 626                       | 343           | 283             |
| 2   | Akkarathathappalli     | 807               | 2619             | 1321 | 1298   | 650           | 0             | 1616                      | 898           | 718             |
| 3   | Arasur                 | 291               | 1042             | 534  | 508    | 187           | 0             | 551                       | 324           | 227             |
| 4   | Ayyampalayam           | 511               | 1757             | 885  | 872    | 80            | 0             | 812                       | 471           | 341             |
| 5   | Baguthampalayam        | 735               | 2429             | 1208 | 1221   | 546           | 28            | 1445                      | 809           | 636             |
| 6   | Boosaripalayam         | 1173              | 3810             | 1934 | 1876   | 709           | 7             | 2184                      | 1277          | 907             |
| 7   | Dhoddampalayam         | 1278              | 4153             | 2086 | 2067   | 256           | 14            | 2957                      | 1616          | 1341            |
| 8   | Ikkarainegamam         | 1682              | 5628             | 2807 | 2821   | 2137          | 12            | 3070                      | 1696          | 1374            |
| 9   | Ikkarathathappalli     | 1211              | 4079             | 2084 | 1995   | 1149          | 14            | 2405                      | 1369          | 1036            |
| 10  | Indiampalayam          | 753               | 2503             | 1251 | 1252   | 171           | 0             | 1564                      | 903           | 661             |
| 11  | Karapadi               | 1019              | 3352             | 1699 | 1653   | 867           | 0             | 1936                      | 1123          | 813             |
| 12  | Karidoddampalayam      | 558               | 1868             | 953  | 915    | 876           | 0             | 987                       | 574           | 413             |
| 13  | Kavilipalayam          | 1424              | 4612             | 2303 | 2309   | 870           | 0             | 2764                      | 1576          | 1188            |
| 14  | Konamoolai             | 1391              | 4881             | 2457 | 2424   | 979           | 6             | 3279                      | 1773          | 1506            |
| 15  | Kothamangalam          | 760               | 2515             | 1266 | 1249   | 696           | 3             | 1490                      | 829           | 661             |
| 16  | Kurumbapalayam         | 441               | 1521             | 777  | 744    | 132           | 0             | 839                       | 488           | 351             |
| 17  | Madampalayam           | 1415              | 4841             | 2430 | 2411   | 1641          | 15            | 2844                      | 1584          | 1260            |
| 18  | Marayeepalayam         | 486               | 1699             | 867  | 832    | 502           | 0             | 973                       | 570           | 403             |
| 19  | Mudukkanthurai         | 134               | 415              | 190  | 225    | 19            | 0             | 263                       | 149           | 114             |
| 20  | Nallur                 | 2586              | 8714             | 4393 | 4321   | 1738          | 0             | 5743                      | 3221          | 2522            |
| 21  | Panayampalli           | 1618              | 5291             | 2642 | 2649   | 1812          | 0             | 3022                      | 1714          | 1308            |
| 22  | Pattavarthiayampalayam | 455               | 1586             | 801  | 785    | 407           | 8             | 895                       | 511           | 384             |
| 23  | Periyakallipatti       | 499               | 1595             | 783  | 812    | 531           | 0             | 919                       | 533           | 386             |
| 24  | Pudupeerkadavu         | 1456              | 4758             | 2397 | 2361   | 1350          | 34            | 2689                      | 1531          | 1158            |
| 25  | Pungampalli            | 678               | 2251             | 1145 | 1106   | 697           | 0             | 1260                      | 730           | 530             |
| 26  | Pungar                 | 897               | 2912             | 1435 | 1477   | 529           | 59            | 1750                      | 958           | 792             |
| 27  | Punjaipuliampatti      | 531               | 1793             | 929  | 864    | 713           | 0             | 1016                      | 579           | 437             |
| 28  | Rajan Nagar            | 1671              | 5599             | 2785 | 2814   | 2013          | 22            | 3024                      | 1706          | 1318            |
| 29  | Sellampalayam          | 385               | 1271             | 656  | 615    | 344           | 0             | 768                       | 436           | 332             |
| 30  | Shenbagapudur          | 1398              | 4801             | 2432 | 2369   | 918           | 3             | 2641                      | 1525          | 1116            |
| 31  | Sunkakaranpalayam      | 533               | 1778             | 919  | 859    | 619           | 0             | 905                       | 546           | 359             |
| 32  | Thatchaperumapalayam   | 349               | 1175             | 603  | 572    | 186           | 0             | 583                       | 362           | 221             |
| 33  | Thoppampalayam         | 1275              | 4351             | 2195 | 2156   | 1117          | 3             | 2382                      | 1344          | 1038            |

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|           |              |              |        |       |       |       |     |       |       |      |
|-----------|--------------|--------------|--------|-------|-------|-------|-----|-------|-------|------|
| <b>34</b> | Ukkaram      | 2781         | 9443   | 4732  | 4711  | 2629  | 0   | 5035  | 2893  | 2142 |
| <b>35</b> | Varapalayam  | 912          | 2962   | 1445  | 1517  | 652   | 0   | 1624  | 920   | 704  |
| <b>36</b> | Vinnappalli  | 1079         | 3550   | 1773  | 1777  | 632   | 1   | 2096  | 1225  | 871  |
|           | <b>Total</b> | <b>35424</b> | 118420 | 59550 | 58870 | 29472 | 229 | 68957 | 39106 | #### |

Source: [www.censusindia.gov.in](http://www.censusindia.gov.in)

**TABLE 3.39: WORKERS PROFILE OF STUDY AREA**

| Sno | Name                   | Total Workers Population | Male Workers | Female Workers | Total Main Workers | Main Workers Male | Main Workers Female | Main Cultivation Workers | Main Agriculture Workers | Main Other Workers | Non-Worker Population |
|-----|------------------------|--------------------------|--------------|----------------|--------------------|-------------------|---------------------|--------------------------|--------------------------|--------------------|-----------------------|
| 1   | Akkarainegamam         | 528                      | 306          | 222            | 520                | 300               | 220                 | 258                      | 125                      | 0                  | 338                   |
| 2   | Akkaraitathappalli     | 1750                     | 935          | 815            | 1687               | 900               | 787                 | 423                      | 631                      | 3                  | 869                   |
| 3   | Arasur                 | 601                      | 363          | 238            | 574                | 355               | 219                 | 107                      | 377                      | 0                  | 441                   |
| 4   | Ayyampalayam           | 993                      | 604          | 389            | 866                | 551               | 315                 | 265                      | 486                      | 2                  | 764                   |
| 5   | Baguthampalayam        | 1594                     | 851          | 743            | 1261               | 702               | 559                 | 562                      | 416                      | 6                  | 835                   |
| 6   | Boosaripalayam         | 2834                     | 1464         | 1370           | 2451               | 1367              | 1084                | 784                      | 994                      | 53                 | 976                   |
| 7   | Dhoddampalayam         | 2541                     | 1443         | 1098           | 2527               | 1440              | 1087                | 136                      | 80                       | 5                  | 1612                  |
| 8   | Ikkarainegamam         | 3465                     | 1953         | 1512           | 3170               | 1868              | 1302                | 741                      | 1684                     | 4                  | 2163                  |
| 9   | Ikkaraitathappalli     | 2615                     | 1401         | 1214           | 2409               | 1325              | 1084                | 503                      | 1020                     | 6                  | 1464                  |
| 10  | Indiampalayam          | 1423                     | 872          | 551            | 1182               | 776               | 406                 | 225                      | 104                      | 20                 | 1080                  |
| 11  | Karapadi               | 1834                     | 1105         | 729            | 1616               | 1013              | 603                 | 415                      | 504                      | 6                  | 1518                  |
| 12  | Karidoddampalayam      | 1167                     | 631          | 536            | 1090               | 608               | 482                 | 70                       | 709                      | 1                  | 701                   |
| 13  | Kavilipalayam          | 2730                     | 1600         | 1130           | 2412               | 1517              | 895                 | 764                      | 467                      | 2                  | 1882                  |
| 14  | Konamoolai             | 2576                     | 1617         | 959            | 1938               | 1312              | 626                 | 230                      | 249                      | 40                 | 2305                  |
| 15  | Kothamangalam          | 1352                     | 847          | 505            | 1295               | 823               | 472                 | 198                      | 527                      | 0                  | 1163                  |
| 16  | Kurumbapalayam         | 954                      | 511          | 443            | 822                | 449               | 373                 | 422                      | 80                       | 4                  | 567                   |
| 17  | Madampalayam           | 2700                     | 1595         | 1105           | 2523               | 1502              | 1021                | 395                      | 812                      | 2                  | 2141                  |
| 18  | Marayeeppalayam        | 990                      | 578          | 412            | 966                | 564               | 402                 | 305                      | 392                      | 0                  | 709                   |
| 19  | Mudukkanthurai         | 207                      | 128          | 79             | 203                | 125               | 78                  | 19                       | 50                       | 0                  | 208                   |
| 20  | Nallur                 | 4332                     | 2784         | 1548           | 4007               | 2641              | 1366                | 385                      | 833                      | 6                  | 4382                  |
| 21  | Panayampalli           | 3008                     | 1762         | 1246           | 2761               | 1715              | 1046                | 873                      | 905                      | 53                 | 2283                  |
| 22  | Pattavarthiayampalayam | 1153                     | 593          | 560            | 980                | 518               | 462                 | 575                      | 256                      | 4                  | 433                   |
| 23  | Periyakallipatti       | 868                      | 563          | 305            | 808                | 536               | 272                 | 142                      | 367                      | 1                  | 727                   |
| 24  | Pudupeerkadavu         | 2604                     | 1558         | 1046           | 2357               | 1508              | 849                 | 418                      | 901                      | 11                 | 2154                  |
| 25  | Pungampalli            | 1150                     | 714          | 436            | 924                | 589               | 335                 | 119                      | 330                      | 2                  | 1101                  |
| 26  | Pungar                 | 1524                     | 940          | 584            | 1464               | 919               | 545                 | 197                      | 457                      | 0                  | 1388                  |
| 27  | Punjaipuliampatti      | 1047                     | 608          | 439            | 1036               | 608               | 428                 | 316                      | 413                      | 0                  | 746                   |
| 28  | Rajan Nagar            | 3020                     | 1899         | 1121           | 2047               | 1472              | 575                 | 560                      | 611                      | 8                  | 2579                  |
| 29  | Sellapampalayam        | 684                      | 411          | 273            | 679                | 408               | 271                 | 113                      | 211                      | 0                  | 587                   |
| 30  | Shenbagapudur          | 2735                     | 1627         | 1108           | 2216               | 1353              | 863                 | 550                      | 1143                     | 2                  | 2066                  |
| 31  | Sunkakaranpalayam      | 1033                     | 617          | 416            | 884                | 550               | 334                 | 347                      | 155                      | 2                  | 745                   |
| 32  | Thatchaperumapalayam   | 823                      | 438          | 385            | 754                | 396               | 358                 | 305                      | 252                      | 2                  | 352                   |

|    |                |       |       |       |       |       |       |       |       |     |       |
|----|----------------|-------|-------|-------|-------|-------|-------|-------|-------|-----|-------|
| 33 | Thoppampalayam | 2654  | 1459  | 1195  | 1911  | 1114  | 797   | 462   | 792   | 18  | 1697  |
| 34 | Ukkaram        | 5678  | 3240  | 2438  | 4615  | 2685  | 1930  | 1190  | 2403  | 9   | 3765  |
| 35 | Varapalayam    | 1645  | 1019  | 626   | 1436  | 922   | 514   | 486   | 516   | 4   | 1317  |
| 36 | Vinnappalli    | 2270  | 1245  | 1025  | 906   | 545   | 361   | 195   | 169   | 6   | 1280  |
|    | <b>Total</b>   | 69082 | 40281 | 28801 | 59297 | 35976 | 23321 | 14055 | 20421 | 282 | 30069 |

Source: [www.censusindia.gov.in](http://www.censusindia.gov.in)

**TABLE 3.40: EDUCATIONAL FACILITIES IN THE STUDY AREA**

| Sno | Name                   | PPS |   | PS |   | MS |   | SS |   | SSS |   | DC |   | EC |   | MC |   | MI |   | PT |   | VTS |   | SSD |   |
|-----|------------------------|-----|---|----|---|----|---|----|---|-----|---|----|---|----|---|----|---|----|---|----|---|-----|---|-----|---|
|     |                        | G   | P | G  | P | G  | P | G  | P | G   | P | G  | P | G  | P | G  | P | G  | P | G  | P | G   | P | G   | P |
| 1   | Akkarainegamam         | 2   | 2 | 1  | 2 | 1  | 2 | 2  | 2 | 2   | 2 | 2  | 2 | 2  | 2 | 2  | 2 | 2  | 2 | 2  | 2 | 2   | 2 | 2   | 2 |
| 2   | Akkaraitthappalli      | 1   | 2 | 1  | 2 | 1  | 2 | 2  | 2 | 2   | 2 | 2  | 2 | 2  | 2 | 2  | 2 | 2  | 2 | 2  | 2 | 2   | 2 | 2   | 2 |
| 3   | Arasur                 | 1   | 2 | 1  | 2 | 1  | 2 | 2  | 2 | 2   | 2 | 2  | 2 | 2  | 2 | 2  | 2 | 2  | 2 | 2  | 2 | 2   | 2 | 2   | 2 |
| 4   | Ayyampalayam           | 1   | 2 | 1  | 2 | 1  | 2 | 2  | 2 | 2   | 2 | 2  | 2 | 2  | 2 | 2  | 2 | 2  | 2 | 2  | 2 | 2   | 2 | 2   | 2 |
| 5   | Baguthampalayam        | 1   | 2 | 1  | 2 | 1  | 2 | 2  | 2 | 2   | 2 | 2  | 2 | 2  | 2 | 2  | 2 | 2  | 2 | 2  | 2 | 2   | 2 | 2   | 2 |
| 6   | Boosaripalayam         | 1   | 2 | 1  | 2 | 1  | 2 | 1  | 2 | 2   | 2 | 2  | 2 | 2  | 2 | 2  | 2 | 2  | 2 | 2  | 2 | 2   | 2 | 2   | 2 |
| 7   | Dhoddampalayam         | 1   | 2 | 1  | 2 | 1  | 2 | 1  | 2 | 1   | 2 | 2  | 2 | 2  | 2 | 2  | 2 | 2  | 2 | 2  | 2 | 2   | 2 | 2   | 2 |
| 8   | Ikkarainegamam         | 1   | 2 | 1  | 2 | 1  | 2 | 2  | 2 | 2   | 2 | 2  | 2 | 2  | 2 | 2  | 2 | 2  | 2 | 2  | 2 | 2   | 2 | 2   | 2 |
| 9   | Ikkaraitthappalli      | 1   | 2 | 1  | 2 | 1  | 2 | 2  | 2 | 2   | 2 | 2  | 2 | 2  | 2 | 2  | 2 | 2  | 2 | 2  | 2 | 2   | 2 | 2   | 2 |
| 10  | Indiampalayam          | 1   | 2 | 2  | 2 | 2  | 2 | 2  | 2 | 2   | 2 | 2  | 2 | 2  | 2 | 2  | 2 | 2  | 2 | 2  | 2 | 2   | 2 | 2   | 2 |
| 11  | Karapadi               | 1   | 2 | 1  | 2 | 1  | 2 | 2  | 2 | 2   | 2 | 2  | 2 | 2  | 2 | 2  | 2 | 2  | 2 | 2  | 2 | 2   | 2 | 2   | 2 |
| 12  | Karidoddampalayam      | 1   | 2 | 1  | 2 | 2  | 2 | 2  | 2 | 2   | 2 | 2  | 2 | 2  | 2 | 2  | 2 | 2  | 2 | 2  | 2 | 2   | 2 | 2   | 2 |
| 13  | Kavilipalayam          | 1   | 2 | 1  | 2 | 1  | 2 | 1  | 2 | 1   | 2 | 2  | 2 | 2  | 2 | 2  | 2 | 2  | 2 | 2  | 2 | 2   | 2 | 2   | 2 |
| 14  | Konamoolai             | 1   | 1 | 1  | 1 | 1  | 1 | 2  | 1 | 2   | 2 | 2  | 2 | 2  | 2 | 2  | 2 | 2  | 2 | 2  | 2 | 2   | 2 | 2   | 2 |
| 15  | Kothamangalam          | 1   | 2 | 1  | 2 | 1  | 2 | 2  | 2 | 2   | 2 | 2  | 2 | 2  | 2 | 2  | 2 | 2  | 2 | 2  | 2 | 2   | 2 | 2   | 2 |
| 16  | Kurumbapalayam         | 1   | 2 | 1  | 2 | 2  | 2 | 2  | 2 | 2   | 2 | 2  | 2 | 2  | 2 | 2  | 2 | 2  | 2 | 2  | 2 | 2   | 2 | 2   | 2 |
| 17  | Madampalayam           | 1   | 2 | 1  | 2 | 1  | 2 | 2  | 2 | 2   | 2 | 2  | 2 | 2  | 2 | 2  | 2 | 2  | 2 | 2  | 2 | 1   | 2 | 2   | 2 |
| 18  | Marayeepalayam         | 1   | 2 | 1  | 2 | 1  | 2 | 2  | 2 | 2   | 2 | 2  | 2 | 2  | 2 | 2  | 2 | 2  | 2 | 2  | 2 | 2   | 2 | 2   | 2 |
| 19  | Mudukkanthurai         | 1   | 2 | 1  | 2 | 2  | 2 | 2  | 2 | 2   | 2 | 2  | 2 | 2  | 2 | 2  | 2 | 2  | 2 | 2  | 2 | 2   | 2 | 2   | 2 |
| 20  | Nallur                 | 1   | 2 | 1  | 1 | 1  | 2 | 1  | 2 | 2   | 1 | 2  | 2 | 2  | 2 | 2  | 2 | 2  | 2 | 2  | 2 | 2   | 2 | 2   | 2 |
| 21  | Panayampalli           | 1   | 2 | 1  | 2 | 1  | 2 | 1  | 2 | 1   | 2 | 2  | 2 | 2  | 2 | 2  | 2 | 2  | 2 | 2  | 2 | 2   | 2 | 2   | 2 |
| 22  | Pattavarthiayampalayam | 1   | 2 | 2  | 2 | 2  | 2 | 2  | 2 | 2   | 2 | 2  | 2 | 2  | 2 | 2  | 2 | 2  | 2 | 2  | 2 | 2   | 2 | 2   | 2 |
| 23  | Periyakallipatti       | 1   | 2 | 1  | 2 | 1  | 2 | 2  | 2 | 2   | 2 | 2  | 2 | 2  | 2 | 2  | 2 | 2  | 2 | 2  | 2 | 2   | 2 | 2   | 2 |
| 24  | Pudupeerkadavu         | 1   | 2 | 1  | 2 | 1  | 2 | 2  | 2 | 2   | 2 | 2  | 2 | 2  | 2 | 2  | 2 | 2  | 2 | 2  | 2 | 2   | 2 | 2   | 2 |
| 25  | Pungampalli            | 1   | 2 | 1  | 2 | 1  | 2 | 2  | 2 | 2   | 2 | 2  | 2 | 2  | 2 | 2  | 2 | 2  | 2 | 2  | 2 | 2   | 2 | 2   | 2 |
| 26  | Pungar                 | 1   | 2 | 1  | 2 | 1  | 2 | 2  | 2 | 2   | 2 | 2  | 2 | 2  | 2 | 2  | 2 | 2  | 2 | 2  | 2 | 2   | 2 | 2   | 2 |
| 27  | Punjaipuliampatti      | 1   | 2 | 1  | 2 | 2  | 2 | 2  | 2 | 2   | 2 | 2  | 2 | 2  | 2 | 2  | 2 | 2  | 2 | 2  | 2 | 2   | 2 | 2   | 2 |
| 28  | Rajan Nagar            | 1   | 2 | 1  | 1 | 1  | 2 | 1  | 2 | 1   | 2 | 2  | 2 | 2  | 2 | 2  | 2 | 2  | 2 | 2  | 2 | 2   | 2 | 2   | 2 |
| 29  | Sellapampalayam        | 1   | 2 | 2  | 2 | 2  | 2 | 2  | 2 | 2   | 2 | 2  | 2 | 2  | 2 | 2  | 2 | 2  | 2 | 2  | 2 | 2   | 2 | 2   | 2 |
| 30  | Shenbagapur            | 1   | 2 | 1  | 2 | 1  | 2 | 2  | 2 | 2   | 2 | 2  | 2 | 2  | 2 | 2  | 2 | 2  | 2 | 2  | 2 | 2   | 2 | 2   | 2 |

|    |                      |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
|----|----------------------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 31 | Sunkakaranpalayam    | 1 | 2 | 1 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| 32 | Thatchaperumapalayam | 1 | 2 | 1 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| 33 | Thoppampalayam       | 1 | 2 | 1 | 2 | 1 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| 34 | Ukkaram              | 1 | 1 | 1 | 1 | 1 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| 35 | Varapalayam          | 1 | 2 | 1 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| 36 | Vinnappalli          | 1 | 2 | 1 | 1 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 1 | 2 | 2 | 2 |

Abbreviations: PPS-Pre-Primary School; SSS-Senior Secondary School; DC-Degree School; PT-Polytechnic; PS-Primary School; G-Government; EC-Engineering College; VTS-Vocational School /ITI; MS-Middle School; P-Private; MC-Medical College; SSD-Special School For Disabled; SS-Secondary School; MI-Management College/Institute;  
 Note – 1 - Available within the village; 2 - Not available

**TABLE 3.41: MEDICAL FACILITIES IN THE STUDY AREA**

| SI. No. | Village Name           | CHC | PHC | PHSC | MCW | TBC | HA | HAM | D | VH | MHC | FWC | NGM-I/O |
|---------|------------------------|-----|-----|------|-----|-----|----|-----|---|----|-----|-----|---------|
| 1       | Akkarainegamam         | 0   | 0   | 0    | 0   | 0   | 0  | 0   | 0 | 0  | 0   | 0   | c       |
| 2       | Akkaraitthappalli      | 0   | 0   | 2    | 0   | 0   | 0  | 0   | 0 | 0  | 0   | 0   | c       |
| 3       | Arasur                 | 0   | 0   | 0    | 0   | 0   | 0  | 0   | 0 | 0  | 0   | 0   | a       |
| 4       | Ayyampalayam           | 0   | 0   | 0    | 0   | 0   | 0  | 0   | 0 | 0  | 0   | 0   | c       |
| 5       | Baguthampalayam        | 0   | 0   | 0    | 0   | 0   | 0  | 0   | 0 | 0  | 0   | 0   | b       |
| 6       | Boosaripalayam         | 0   | 0   | 1    | 0   | 0   | 0  | 0   | 0 | 1  | 0   | 0   | b       |
| 7       | Dhoddampalayam         | 0   | 0   | 1    | 0   | 0   | 0  | 0   | 0 | 0  | 0   | 0   | c       |
| 8       | Ikkarainegamam         | 0   | 0   | 1    | 0   | 0   | 0  | 0   | 0 | 0  | 0   | 0   | b       |
| 9       | Ikkaraitthappalli      | 0   | 0   | 1    | 0   | 0   | 0  | 0   | 0 | 1  | 0   | 0   | b       |
| 10      | Indiampalayam          | 0   | 0   | 2    | 0   | 0   | 0  | 0   | 0 | 0  | 0   | 0   | b       |
| 11      | Karapadi               | 0   | 0   | 1    | 0   | 0   | 0  | 0   | 0 | 0  | 0   | 0   | b       |
| 12      | Karidoddampalayam      | 0   | 0   | 0    | 0   | 0   | 0  | 0   | 0 | 0  | 0   | 0   | c       |
| 13      | Kavilipalayam          | 0   | 0   | 1    | 0   | 0   | 0  | 0   | 0 | 1  | 0   | 0   | a       |
| 14      | Konamoolai             | 0   | 0   | 1    | 0   | 0   | 0  | 0   | 0 | 0  | 0   | 0   | c       |
| 15      | Kothamangalam          | 0   | 0   | 1    | 0   | 0   | 0  | 0   | 0 | 0  | 0   | 0   | b       |
| 16      | Kurumbapalayam         | 0   | 0   | 1    | 0   | 0   | 0  | 0   | 0 | 0  | 0   | 0   | a       |
| 17      | Madampalayam           | 0   | 0   | 1    | 0   | 0   | 0  | 0   | 0 | 0  | 0   | 0   | a       |
| 18      | Marayeeppalayam        | 0   | 0   | 0    | 0   | 0   | 0  | 0   | 0 | 0  | 0   | 0   | a       |
| 19      | Mudukkanthurai         | 0   | 0   | 0    | 0   | 0   | 0  | 0   | 0 | 1  | 0   | 0   | c       |
| 20      | Nallur                 | 0   | 0   | 1    | 0   | 0   | 0  | 0   | 0 | 0  | 0   | 0   | a       |
| 21      | Panayampalli           | 0   | 0   | 1    | 0   | 0   | 0  | 0   | 0 | 1  | 0   | 0   | b       |
| 22      | Pattavarthiayampalayam | 0   | 0   | 0    | 0   | 0   | 0  | 0   | 0 | 0  | 0   | 0   | b       |
| 23      | Periyakallipatti       | 0   | 0   | 1    | 0   | 0   | 0  | 0   | 0 | 0  | 0   | 0   | b       |
| 24      | Pudupeerkadavu         | 0   | 0   | 1    | 0   | 0   | 0  | 0   | 0 | 0  | 0   | 0   | a       |
| 25      | Pungampalli            | 0   | 0   | 1    | 0   | 0   | 0  | 0   | 0 | 1  | 0   | 0   | b       |
| 26      | Pungar                 | 0   | 0   | 2    | 0   | 0   | 0  | 0   | 0 | 1  | 0   | 0   | c       |
| 27      | Punjaipuliampatti      | 0   | 0   | 1    | 0   | 0   | 0  | 0   | 0 | 0  | 0   | 0   | b       |
| 28      | Rajan Nagar            | 0   | 1   | 1    | 1   | 1   | 0  | 0   | 1 | 1  | 0   | 1   | a       |
| 29      | Sellapampalayam        | 0   | 0   | 1    | 0   | 0   | 0  | 0   | 0 | 0  | 0   | 0   | b       |
| 30      | Shenbagapudur          | 0   | 0   | 1    | 0   | 0   | 0  | 0   | 0 | 0  | 0   | 0   | b       |
| 31      | Sunkakaranpalayam      | 0   | 0   | 0    | 0   | 0   | 0  | 0   | 0 | 0  | 0   | 0   | b       |

|    |                      |   |   |   |   |   |   |   |   |   |   |   |   |   |
|----|----------------------|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 32 | Thatchaperumapalayam | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | b |
| 33 | Thoppampalayam       | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | b |
| 34 | Ukkaram              | 1 | 1 | 1 | 1 | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 1 | a |
| 35 | Varapalayam          | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | b |
| 36 | Vinnappalli          | 0 | 1 | 2 | 1 | 1 | 0 | 0 | 1 | 1 | 0 | 0 | 1 | a |

Abbreviations: CHC-Community Health Centre; TBC-TB Clinic; VH- Veternity Hospital; PHC-Primary Health Centre; HA-Aallopathic Hospital; FWC-Family Welfare Centre; PHSC-Primary Health Sub Centre; HAM-Alternative Medicine Hospital; MH-Mobile Health Clinic; MCW-Maternity and Child Welfare Centre; D-Dispensary; NGM-I/O-Non-Government Medical Facilities In & Out Patient

Note – 1 - Available within the village; 2 - Not available      a-facility available at <5kms      b-facility available at>10kms

Source: www.censusindia.gov.in



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### 3.6.6 Recommendation and Suggestion

- The main activities in the area are agriculture, quarry operation and Crushing units there are 2 Numbers of quarries operated in the region.
- There is no Crushers operating within 500m and the demand of Rough stone Nos of peoples depending upon the Crushing units in the area and crushers are meeting scarcity due to supply demand in the region.
- Due to the project about 27 Nos of peoples will be benefitted directly due to employment and more than 50 Nos of peoples and Crushers will be benefitted through this project
- As part of CER activities proponent intends to spend Rs 5 Lakhs.
- At the end of the life of the mine the mined-out pit will act as temporary reservoir, the collected rain water in the mine pit may utilized for the nearby agriculture lands.

#### **Apart from the following general activities will be conducted**

- Awareness program to be conducted to make the population aware to get education and a better livelihood.
- Vocational training programme can be organized to make the people self - employed, particularly for women and unemployed youth.
- On the basis of qualification and skills local community may be preferred. Long term and short-term employments can be generated.
- While developing an Action Plan, it is very important to identify the population who falls under the marginalized and vulnerable groups. So that special attention can be given to these groups with special provisions while making action plans.

### 3.6.7 Summary & 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. Their expectation is to earn some income for their sustainability on a long-term basis. The proposed project will aim to provide preferential employment to the local people there by improving the employment opportunity in the area and in turn the social standards will improve.

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## 4. ANTICIPATED ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

### 4.0 GENERAL

Environmental impacts both direct and indirect on various environmental attributes due to proposed mining activity will be created in the surrounding environment, during the operational and post-operational phases. The occurrence of mineral deposits, being site specific, their exploitation, often, does not allow for any choice except adoption of eco-friendly operation. The methods are required to be selected in such a manner, so as to maintain environmental equilibrium ensuring sustainable development.

In order to maintain the environmental commensuration with the mining operation, it is essential to undertake studies on the existing environmental scenario and assess the impact on different environmental components. This would help in formulating suitable management plans sustainable resource extraction.

Several scientific techniques and methodologies are available to predict impacts of physical environment. Mathematical models are the best tools to quantitatively describe the cause-and-effect relationships between sources of pollution and different components of environment. In cases where it is not possible to identify and validate a model for a particular situation, predictions have been arrived at based on logical reasoning /consultation / extrapolation.

The following parameters are of significance in the Environmental Impact Assessment and are being discussed in detail

- Land environment
- Soil environment
- Water Environment
- Air Environment
- Noise Environment
- Socio economic environment
- Biological Environment

Based on the baseline environmental status at the project site, the environmental factors that are likely to be affected (Impacts) are identified, quantified and assessed.

### 4.1 LAND ENVIRONMENT:

#### 4.1.2 Anticipated Impact

- 1.62.48 Ha of the land will be under mining sine the Permanent or temporary change on land use and land cover will occur
- Movement of heavy vehicles sometimes cause problems to agricultural land, human habitations due to dust, noise and it also causes traffic hazards.
- Due to degradation of land by pitting the aesthetic environment of the core zone may be affected.
- Earthworks during the rainy season increase the potential for soil erosion and sediment laden water entering the water ways.

If no due care is taken wash off from the exposed working area may choke the water course & can also causes the siltation of water course

### 4.1.2 Mitigation Measures

- The 1.62.48Ha of the land will be converted into temporary reservoir which will full fill the water scarcity in the drought season and the nearby agriculture land will be benefitted by the supply of water
- About 1,150 Nos of trees will be planted in the lease area and approach road will retain the eco system
- The mining activity will be gradual confined in blocks and excavation will be undertaken progressively along with other mitigative measures like phase wise development in the production
- Construction of garland drains all around the quarry pits and construction of silt trap at strategic location in lower elevations to prevent erosion due to surface runoff during rainfall and also to collect the storm water for various uses within the proposed area.
- Green belt development along the boundary within safety zone. The small quantity of water stored in the mined-out pit will be used for greenbelt.
- Thick plantation will be carried out on unutilized area, top benches of mined out pits, on safety barrier, etc.,
- Fencing will be constructed before starting the mining operation and it will be maintained in the conceptual stage Security will be posted round the clock, to prevent inherent entry of the public and cattle.

### 4.1.3 Soil Environment

#### 4.1.4 Impact on Soil Environment

- Removal of vegetation cover
- Soil Erosion in the project site during rainy season due to quarry operation

### 4.1.5 Mitigation Measures

- Garland drains will be constructed all around the project boundary to prevent surface flows from entering the quarry. And will be discharged into vegetated natural drainage lines, or as distributed flow across an area stabilised against erosion.
- Sedimentation ponds - Run-off from working areas will be routed towards sedimentation ponds (Silt pond). These trap sediments and reduce suspended sediment loads before runoff is discharged from the quarry site. Sedimentation ponds should be designed based on runoff, retention times, and soil characteristics. There may be a need to provide a series of sedimentation ponds to achieve the desired outcome.
- Retain vegetation – Retain existing or re-plant the vegetation at the site wherever possible.
- Monitoring and maintenance – Weekly monitoring and daily maintenance of erosion control systems so that they perform as specified specially during rainy season.

### 4.1.6 Waste Dump Management

There is no waste anticipated in this Rough Stone and gravel quarrying operation. The entire quarried out materials will be utilized (100%).

## 4.2 WATER ENVIRONMENT

### 4.2.1 Anticipated Impact

- The major sources of water pollution normally associated due to mining and allied operations are:
  - Generation of waste water from vehicle washing.
  - Washouts from surface exposure or working areas
  - Domestic sewage
  - Disturbance to drainage course in the project area
  - Mine Pit water discharge
- Increase in sediment load during monsoon in downstream of lease area
- This being a mining project, there will be no process effluent. Waste from washing of machinery may result in discharge of Oil & grease, suspended solids.

- The sewage from soak pit may percolate to the ground water table and contaminate it.
- Surface drainage may be affected due to Mining
- Abstraction of water may lead to depletion of water table
- 2.3 KLD water will be utilized for the quarrying operation

#### 4.2.2 Mitigation Measures

- Water for the quarrying operation such as sprinkling on haul roads, Greenbelt development will be sourced from the lower part of the mine pit which is specifically allotted to collect the rain water.
- Garland drain, settling tank will be constructed along the proposed mining lease area. The Garland drain will be connected to settling tank and sediments will be trapped in the settling traps and only clear water will be discharged out to the natural drainage
- Rainwater will be collected in sump in the mining pits and will be allowed to store and pumped out to surface setting tank of 15 m x 10m x 3m to remove suspended solids if any. This collected water will be judiciously used for dust suppression and such sites where dust likely to be generated and for developing green belt. The proponent will collect and judiciously utilize the rainwater as part of rainwater harvesting system.
- Periodic (every 6 month once) analysis of quarry pit water and ground water quality in nearby villages.
- Domestic sewage from site office & urinals/latrines provided in ML is discharged in septic tank followed by soak pits.
- Wastewater discharge from mine will be treated in settling tanks before using for dust suppression and tree plantation purposes.
- De-silting will be carried out before and immediately after the monsoon season.

### 4.3 AIR ENVIRONMENT

#### 4.3.1. Anticipated Impact

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

##### 4.3.1.1. Modelling of Incremental Concentration from all Proposed Projects

Wind erosion of the exposed areas and the air borne particulate matter generated by quarrying operation, and transportation are mainly PM<sub>10</sub>& PM<sub>2.5</sub> and emissions of Sulphur dioxide (SO<sub>2</sub>) & Oxides of Nitrogen (NO<sub>x</sub>) due to excavation/loading equipment and vehicles plying on haul roads are the cause of air pollution in the project area.

Similarly, loading -unloading and transportation of Rough Stone, wind erosion of the exposed area and movement of light vehicles causes of pollution. This leads to an impact on the ambient air environment around the project area.

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

### AERMOD Software.

Prediction of impacts on air environment has been carried out taking into consideration cumulative production all the quarries fall in the Cluster. Air environment and net increase in emissions by Open pit source modelling in AERMOD Software AERMOD 12.

#### 4.3.2.1 Emission Estimation

An emissions factor is a representative value that attempts to relate the quantity of a pollutant released to the atmosphere with an activity associated with the release of that pollutant.

The general equation for emissions estimation is:

$$E = A \times EF \times (1-ER/100)$$

Where:

E = emissions;

A = activity rate;

EF = emission factor, and

ER =overall emission reduction efficiency, %

The proposed mining activity includes various activities like ground preparation, excavation, handling and transport of Rough Stone. These activities have been analysed systematically basing on USEPA-Emission Estimation Technique Manual, for Mining AP-42, to arrive at possible emissions to the atmosphere and estimated emissions are given in Table 4-2.

#### 4.3.2 Frame work of Computation & Model details

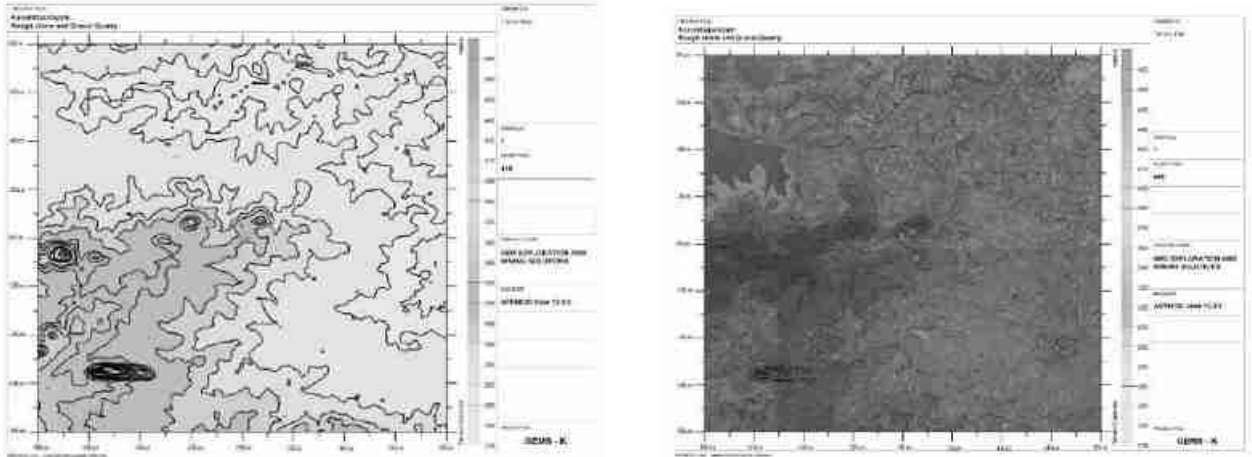
Suspended Particulate Matter (SPM)is the major pollutant occurred during quarrying activities. The prediction included the impact of Excavation, Drilling, Blasting (Occasionally), loading and movement of vehicles during transportation and meteorological parameters such as wind speed, wind direction, temperature, rainfall, humidity and Cloud cover.

Impact was predicted over the distance of 10 km around the source to assess the impact at each receptor separately at the various locations and maximum incremental GLC value at the project site. Maximum impact of PM<sub>10</sub> was observed close to the source due to low to moderate wind speeds. Incremental value of PM<sub>10</sub> was superimposed on the base line data monitored at the proposed site to predict total GLC of PM<sub>10</sub> due to combined impacts

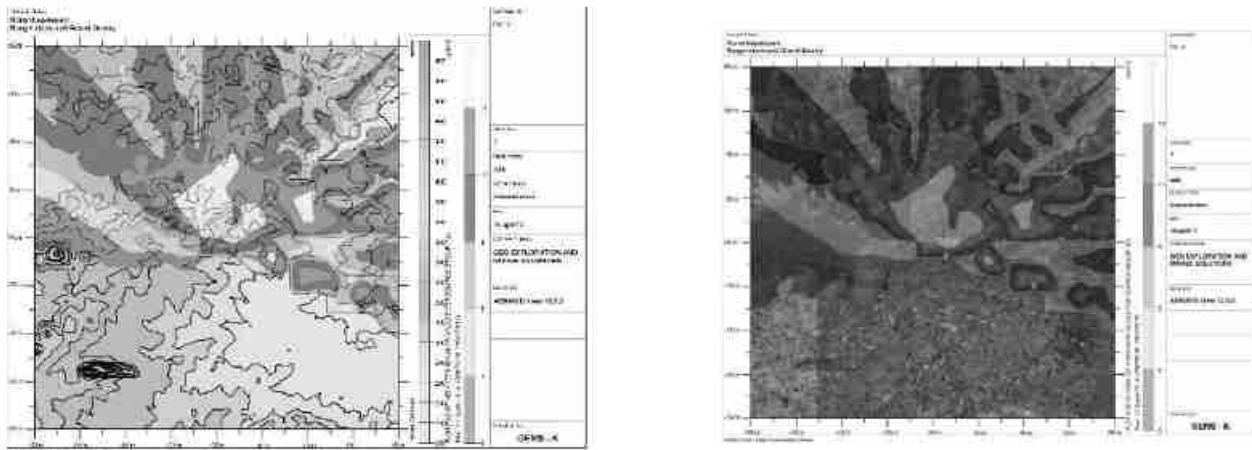
**TABLE 4.1: ESTIMATED EMISSION RATE**

| PM <sub>10</sub> |              |             |       |
|------------------|--------------|-------------|-------|
| Activity         | Source type  | Value       | Unit  |
| Drilling         | Point Source | 0.091142629 | g/s   |
| Blasting         | Point Source | 0.001521326 | g/s   |
| Mineral Loading  | Point Source | 0.042896044 | g/s   |
| Haul Road        | Line Source  | 0.002493192 | g/s/m |
| Overall Mine     | Area Source  | 0.055245325 | g/s   |
| So <sub>2</sub>  | Area Source  | 0.000765343 | g/s   |
| Nox              | Area Source  | 0.000039376 | g/s   |

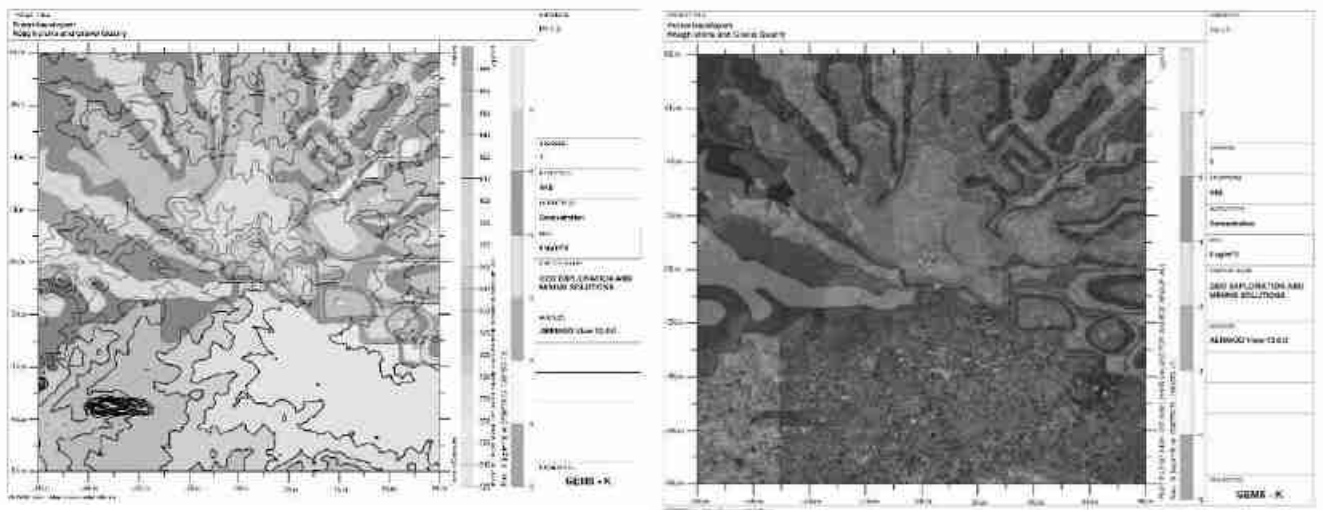
**FIGURE 4.1: AERMOD TERRAIN MAP**



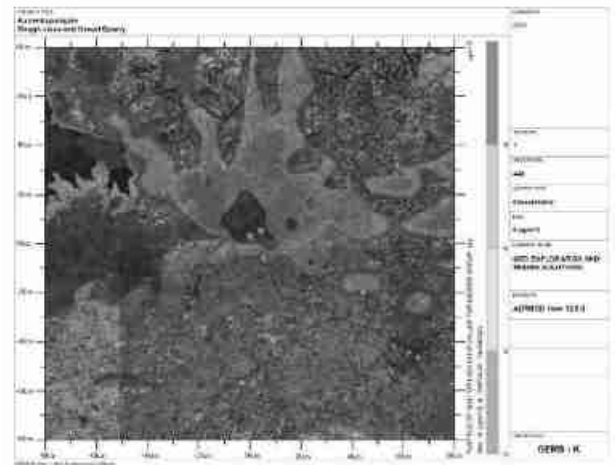
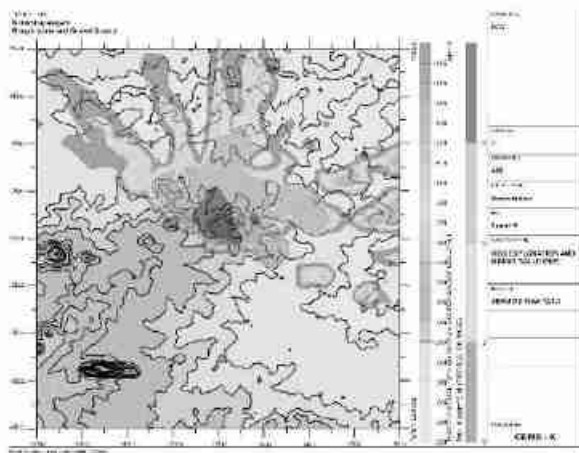
**FIGURE 4.2: PREDICTED INCREMENTAL CONCENTRATION OF PM<sub>10</sub>**



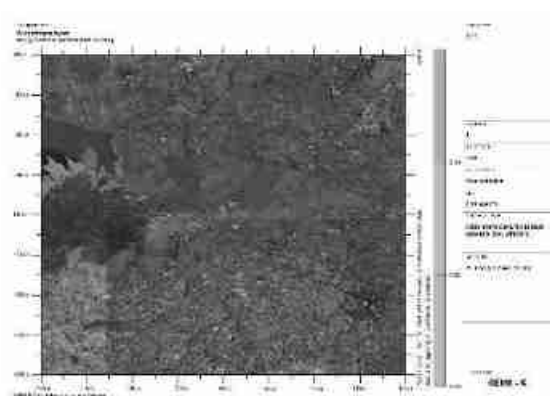
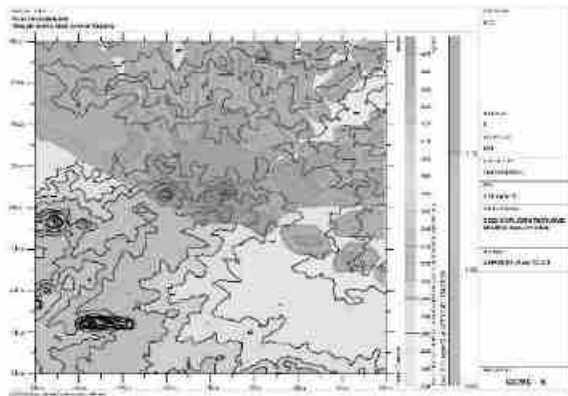
**FIGURE 4.3: PREDICTED INCREMENTAL CONCENTRATION OF PM<sub>2.5</sub>**



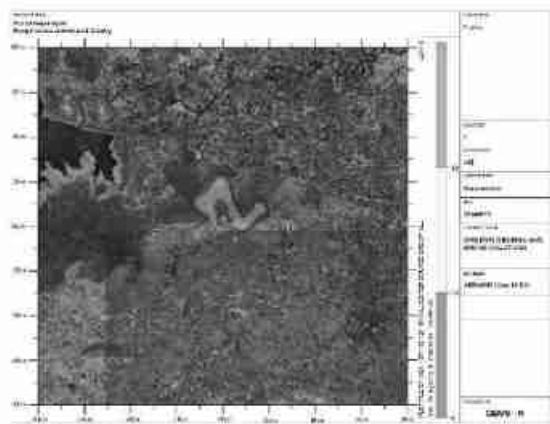
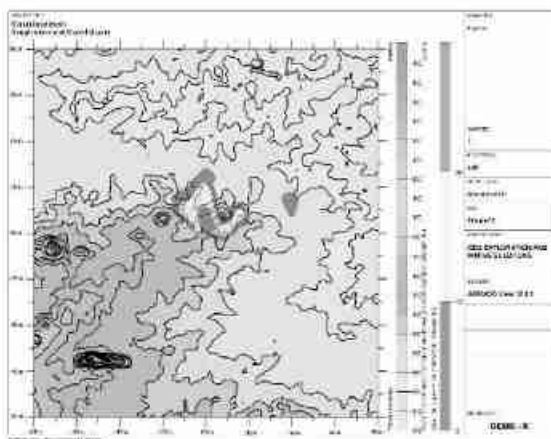
**FIGURE 4.4: PREDICTED INCREMENTAL CONCENTRATION OF NO<sub>x</sub>**



**FIGURE 4.5: PREDICTED INCREMENTAL CONCENTRATION OF SO<sub>2</sub>**



**FIGURE 4.6: PREDICTED INCREMENTAL CONCENTRATION OF FUGITIVE**



### 4.3.2.1 Model Results

The post project Resultant Concentrations of PM<sub>10</sub>, PM<sub>2.5</sub>, SO<sub>2</sub>&NO<sub>x</sub> (GLC) is given in Table below:

**TABLE 4.2: INCREMENTAL & RESULTANT GLC OF PM<sub>10</sub>**

| Station Code | Location                       | X Coordinate (m) | Y Coordinate (m) | Average Baseline PM <sub>10</sub> (µg/m <sup>3</sup> ) | Incremental value of PM <sub>10</sub> due to mining (µg/m <sup>3</sup> ) | Total PM <sub>10</sub> (µg/m <sup>3</sup> ) |
|--------------|--------------------------------|------------------|------------------|--|--|---|
| AAQ1         | 11°25'51.28"N<br>77°10'12.14"E | -3               | -28              | 43.3   | 14.83  | 58.13                                       |
| AAQ2         | 11°25'58.06"N<br>77°10'26.56"E | 435              | 173              | 42.8   | 14.37  | 57.17                                       |
| AAQ3         | 11°25'21.81"N<br>77°10'30.46"E | 557              | -945             | 41.9   | 0  | 41.9  |
| AAQ4         | 11°27'41.22"N 77°<br>8'46.69"E | -2609            | 3368             | 42.7   | 10.00  | 52.7  |
| AAQ5         | 11°23'39.42"N 77°<br>8'9.34"E  | -3750            | -4121            | 43.2   | 0  | 43.2  |
| AAQ6         | 11°27'47.99"N<br>77°12'54.44"E | 5854             | 2753             | 42.6   | 13.00  | 55.6  |
| AAQ7         | 11°23'57.54"N<br>77°12'45.63"E | 4455             | -2323            | 42.7   | 0  | 42.7  |

**TABLE 4.3: INCREMENTAL & RESULTANT GLC OF PM<sub>2.5</sub>**

| Station Code | Location                    | X Coordinate (m) | Y Coordinate (m) | Average Baseline PM <sub>2.5</sub> (µg/m <sup>3</sup> ) | Incremental value of PM <sub>2.5</sub> due to mining (µg/m <sup>3</sup> ) | Total PM <sub>2.5</sub> (µg/m <sup>3</sup> ) |
|--------------|-----------------------------|------------------|------------------|---|---|--|
| AAQ1         | 11°25'51.28"N 77°10'12.14"E | -3               | -28              | 22.0  | 6.89  | 28.89  |
| AAQ2         | 11°25'58.06"N 77°10'26.56"E | 435              | 173              | 20.3  | 6.42  | 26.72  |
| AAQ3         | 11°25'21.81"N 77°10'30.46"E | 557              | -945             | 22.2  | 0   | 22.2   |
| AAQ4         | 11°27'41.22"N 77° 8'46.69"E | -2609            | 3368             | 18.6  | 4.66  | 23.26  |
| AAQ5         | 11°23'39.42"N 77° 8'9.34"E  | -3750            | -4121            | 22.1  | 0   | 22.1   |
| AAQ6         | 11°27'47.99"N 77°12'54.44"E | 5854             | 2753             | 21.9  | 5.81  | 27.71  |
| AAQ7         | 11°23'57.54"N 77°12'45.63"E | 4455             | -2323            | 23.0  | 3.55  | 26.55  |

**TABLE 4.4: INCREMENTAL & RESULTANT GLC OF SO<sub>2</sub>**

| Station Code | Location                    | X Coordinate (m) | Y Coordinate (m) | Average Baseline SO <sub>2</sub> (µg/m <sup>3</sup> ) | Incremental value due to mining (µg/m <sup>3</sup> ) | Total SO <sub>2</sub> (µg/m <sup>3</sup> ) |
|--------------|-----------------------------|------------------|------------------|---|--|--|
| AAQ1         | 11°25'51.28"N 77°10'12.14"E | -3               | -28              | 7.4   | 2.19   | 9.59                                       |
| AAQ2         | 11°25'58.06"N 77°10'26.56"E | 435              | 173              | 6.9   | 2.15   | 9.05                                       |
| AAQ3         | 11°25'21.81"N 77°10'30.46"E | 557              | -945             | 7.6   | 0  | 7.6  |
| AAQ4         | 11°27'41.22"N 77° 8'46.69"E | -2609            | 3368             | 7.0   | 1.17   | 8.17                                       |
| AAQ5         | 11°23'39.42"N 77° 8'9.34"E  | -3750            | -4121            | 6.5   | 0  | 6.5  |
| AAQ6         | 11°27'47.99"N 77°12'54.44"E | 5854             | 2753             | 7.1   | 2.10   | 9.2  |
| AAQ7         | 11°23'57.54"N 77°12'45.63"E | 4455             | -2323            | 7.0   | 0  | 7  |

**TABLE 4.5: INCREMENTAL & RESULTANT GLC OF NO<sub>x</sub>**

| Station Code | Location | X Coordinate (m) | Y Coordinate (m) | Average Baseline NO <sub>x</sub> (µg/m <sup>3</sup> ) | Incremental value due to mining (µg/m <sup>3</sup> ) | Total NO <sub>x</sub> (µg/m <sup>3</sup> ) |
|--------------|----------|------------------|------------------|---|--|--|
|--------------|----------|------------------|------------------|---|--|--|



|      |                             |       |       |      |      |       |
|------|-----------------------------|-------|-------|------|------|-------|
| AAQ1 | 11°25'51.28"N 77°10'12.14"E | -3    | -28   | 23.4 | 9.73 | 33.13 |
| AAQ2 | 11°25'58.06"N 77°10'26.56"E | 435   | 173   | 22.5 | 9.14 | 31.64 |
| AAQ3 | 11°25'21.81"N 77°10'30.46"E | 557   | -945  | 26.3 | 0    | 26.3  |
| AAQ4 | 11°27'41.22"N 77° 8'46.69"E | -2609 | 3368  | 22.2 | 0    | 22.2  |
| AAQ5 | 11°23'39.42"N 77° 8'9.34"E  | -3750 | -4121 | 24.1 | 0    | 24.1  |
| AAQ6 | 11°27'47.99"N 77°12'54.44"E | 5854  | 2753  | 23.6 | 7.00 | 30.6  |
| AAQ7 | 11°23'57.54"N 77°12'45.63"E | 4455  | -2323 | 25.5 | 0    | 25.5  |

From the resultant of cumulative concentration i.e., Background + Incremental Concentration of pollutant in all the receptor locations without effective mitigation measures are still within the prescribed NAAQ limits of 100, 80 & 80 µg/m<sup>3</sup> for PM<sub>10</sub>, SO<sub>2</sub> & NO<sub>x</sub> respectively. By adopting suitable mitigation measures, the pollutant levels in the atmosphere can be further being controlled.

#### 4.3.4. Mitigation Measures

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

##### Advantages of Wet Drilling: -

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

##### Blasting –

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

##### Haul Road& Transportation –

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

**Green Belt –**

- 540 trees will be planted along the safety barrier located in the leased area to prevent dust generation due to movement of tippers/trucks.
- Some trees will be planted along village road and nearby schools.

**Occupational Health –**

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

**4.4 NOISE ENVIRONMENT**

Noise pollution is mainly due to operation like drilling & blasting and plying of trucks & HEMM. These activities will not cause any problem to the inhabitants of this area because there is no human settlement within 300m radius from the project site. Noise modelling has been carried out considering blasting and compressor operation (drilling) and transportation activities.

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

Basic phenomenon of the model is the geometric attenuation of sound. Noise at a point generates spherical waves, which are propagated outwards from the source through the air at 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 model based on first principle.

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

Where:

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

$A_{e1,2}$  is the excess attenuation due to environmental conditions. Combined effect of all sources can be determined at various locations by logarithmic addition.

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

**4.4.1 Anticipated Impact**

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

- Source data
- Receptor data
- Attenuation factor

Source data has been computed taking into account of all the machinery and activities used in the mining process. Same has been listed in Table 4-8.

**TABLE 4.6: ACTIVITY AND NOISE LEVEL PRODUCED BY MACHINERY**

| Sl.No. | Machinery / Activity | Impact on Environment? | Noise Produced in dB(A) at 50 ft from source* |
|--------|----------------------|------------------------|---|
| 1      | Blasting             | Yes                    | 94  |

|                      |             |     |      |
|----------------------|-------------|-----|------|
| 2                    | Jack Hammer | Yes | 88   |
| 3                    | Compressor  | No  | 81   |
| 4                    | Excavator   | No  | 85   |
| 5                    | Tipper      | No  | 84   |
| Total Noise Produced |             |     | 95.8 |

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

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

**TABLE 4.7: PREDICTED NOISE INCREMENTAL VALUES**

| Location ID                         | N1   | N2   | N3   | N4   | N5   | N6   | N7   |
|-------------------------------------|------|------|------|------|------|------|------|
| Maximum Monitored Value (Day) dB(A) | 53.2 | 53.4 | 51.9 | 44.1 | 44.5 | 47.8 | 47.2 |
| Incremental Value dB(A)             | 56.6 | 51.3 | 40.1 | 28.1 | 25.4 | 24.7 | 25.0 |
| Total Predicted Noise level dB(A)   | 58.2 | 55.5 | 52.2 | 44.2 | 44.6 | 47.8 | 47.2 |

The incremental noise level is found within the range of 56.6dB (A) in Core Zone and 24.7-51.3 dB(A) in Buffer zone. The noise level at different receptors in buffer zone is lower due to the distance involved and other topographical features adding to the noise attenuation. The resultant Noise level due to monitored values and calculated values at the receptors are based on the mathematical formula considering attenuation due to Green Belt as 4.9 dB (A) the barrier effect. From the above table, it can be seen that the ambient noise levels at all the locations are within permissible limits of Industrial area (core zone) & Residential area (buffer zone) as per THE NOISE POLLUTION (REGULATION AND CONTROL) RULES, 2000 (The Principal Rules were published in the Gazette of India, vide S.O. 123(E), dated 14.2.2000 and subsequently amended vide S.O. 1046(E), dated 22.11.2000, S.O. 1088(E), dated 11.10.2002, S.O. 1569 (E), dated 19.09.2006 and S.O. 50 (E) dated 11.01.2010 under the Environment (Protection) Act, 1986.).

#### 4.4.2 Mitigation Measures

The following noise mitigation measures are proposed for control of Noise

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

#### 4.4.3 Ground Vibrations

Ground vibrations due to the proposed mining activities are anticipated due to operation of Mining Machines like Excavators, drilling and blasting, transportation vehicles, etc., However, the major source of ground vibration from the quarry is blasting. The major impact of the ground vibrations is observed on the domestic houses located in

the villages nearby the mine lease area. The kuchha houses are more prone to cracks and damage due to the vibrations induced by blasting whereas RCC framed structures can withstand more ground vibrations. Apart from this, the ground vibrations may develop a fear factor in the nearby settlements.

Another impact due to blasting activities is fly rocks. These may fall on the houses or agricultural fields nearby the mining lease area and may cause injury to persons or damage to the structures. Nearest habitation from the proposed project areas is listed in below table. The ground vibrations due to the blasting in the quarry are calculated using the empirical equation.

The empirical equation for assessment of peak particle velocity (PPV) is:

$$V = K [R/Q^{0.5}]^{-B}$$

Where –

V = peak particle velocity (mm/s)

K = site and rock factor constant

Q = maximum instantaneous charge (kg)

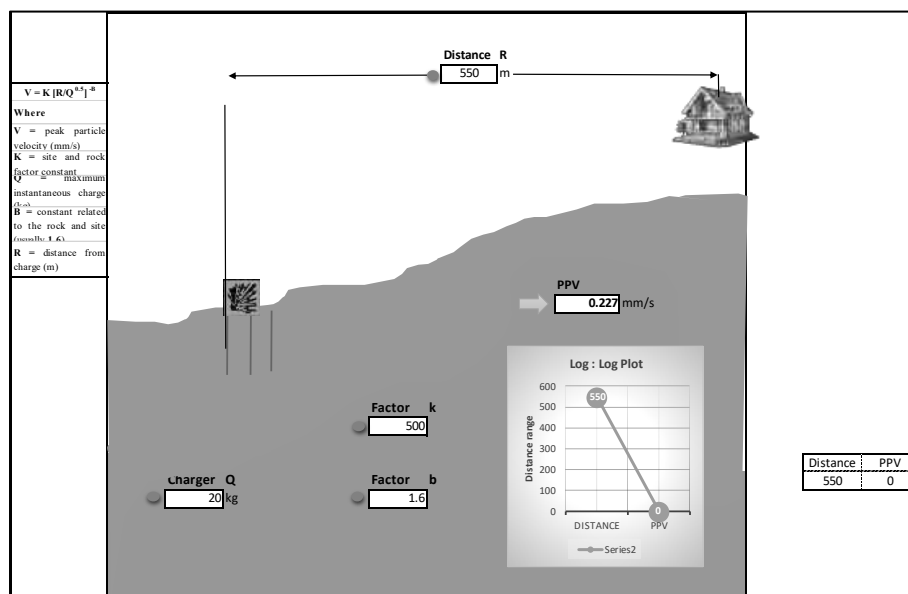
B = constant related to the rock and site (usually 1.6)

R = distance from charge (m)

**TABLE 4.8: PREDICTED PPV VALUES DUE TO BLASTING**

| Location ID | Maximum Charge in kgs | Nearest Habitation in m | PPV in m/ms |
|-------------|-----------------------|-------------------------|-------------|
| P1          | 20                    | 550                     | 0.227       |

**FIGURE 4.7: GROUND VIBRATION PREDICTION**



From the above graph, the charge per blast of 20kg is well below the Peak Particle Velocity of 8 mm/s as per Directorate General of Mines Safety for safe level criteria through Circular No. 7 dated 29/8/1997. But the all the project proponent ensures that the charge per blast shall be less than 85 kg and carry out blasting twice or thrice a day based on the onsite conditions under the supervision of competent person employed. However, as per statutory requirement control measures will be adopted to avoid the impacts due to ground vibrations and fly rocks due to blasting.

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#### 4.4.3.1 Mitigation Measures

- It is proposed to carry out blasting operation 20kg per round so that the vibration will be minimal
- The mining operation will be carried out without deep hole drilling, 25mm small Di cartridge will be utilized for the blasting
- The blasting operations in the project site without deep hole drilling and blasting using delay detonators, which reduces the ground vibrations;
- Proper quantity of explosive, suitable stemming materials and appropriate delay system will be adopted to avoid overcharging and for safe blasting;
- Adequate safe distance from blasting will be maintained as per DGMS guidelines;
- Blasting shelter will be provided as per DGMS guidelines;
- Blasting operations will be carried out only during day time;
- The charge per delay will be minimized and preferably a greater number of delays will be used per blasts;
- During blasting, other activities in the immediate vicinity will be temporarily stopped;
- Drilling parameters like depth, diameter and spacing will be properly designed to give proper blast;
- A fully trained explosives blast man (Mining Mate, Mines Foreman, 2<sup>nd</sup>Class Mines Manager/ 1<sup>st</sup>Class Mines Manager) will be appointed.
- A set of shot firing rules will be drawn up and blasting shall commence outlining the detailed operating procedures that will be followed to ensure that shot firing operations on site take place without endangering the workforce or public.
- The detonators will be connected in a predetermined sequence to ensure that only one charge is detonated at any one time and a NONEL or similar type initiation system will be used.
- The detonation delay sequence shall be designed so as to ensure that firing of the holes is in the direction of free faces so as to minimise vibration effects.
- Appropriate blasting techniques shall be adopted such that the predicted peak particle velocity shall not exceed 8 mm/s.
- Vibration monitoring will be carried out every 6 months to check the efficacy of blasting practices

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## 4.5 ECOLOGY AND BIODIVERSITY

### Impact on the Biological Environment

#### 4.5.1. Anticipated Impact on agricultural land associated with flora

1. Dust particle settle on neighbouring agricultural land, it is located about 100m on the South side. Mostly dust emission from nearby crusher unit and during operation and minerals are transported in approach roads.
2. There shall be negligible air emissions or effluents from the project site. During the loading of the truck, dust generation will be likely. This shall be a temporary effect and not anticipated to affect the surrounding vegetation significantly.

#### 4.5.2 Mitigation Measures

##### 4.5.2.1. General Guidelines for Green Belt Development

Drone survey was covered the green belt and fencing as per the terms of references. The green belt and plantation purposes in and around the proposed mine lease area native species, fruit-bearing trees, medicinal plants, and dense canopy trees should be selected. These species should be tolerant to pollution levels as per Bio- Geography zones of India.

After the operation of mining production capacity, green belt and Plantation species should be in accordance with the Terms and Conditions of the Environmental Clearance Green belt is created not only for the purpose of protecting sensitive areas or maintaining the ecological balance but because they also act as efficient biological filters or sinks for particulate and gaseous emissions, generated by vehicular movements and various industrial and mining activities. Optimally designed green belts can be effective in reducing the impact of fugitive emissions and pollutants accidentally or otherwise released at ground levels.

##### 4.5.2.2. Proposed Green Belt

Extensive green belt development will be started during the construction phase, which will continue till the operation of the plant. About 1500-2000 trees will be planted per hectare all around the plant, approach roads, and township premises. Locally available types of trees that are resistant to pollutants will be planted. In addition to the above, all open spaces available within the premises will be developed as nurseries, parks, gardens, and other forms of greenery. 5 m wide greenbelt will be developed along the plant premises, as per land available.

##### 4.5.2.3. Development of Green Belt

The plantation matrix adopted for the green belt development includes pit of 0.3 m x 0.3 m in size with a spacing of 2 m x 2 m. In addition, earth filling and manure may also be required for the proper nutritional balance and nourishment of the sapling. It is also recommended that the plantation has to be taken up randomly and the landscaping aspects could be taken into consideration. Multi-layered plantations comprising of medium height trees (7 m to 10 m) and shrubs (5 m height) are proposed for the green belt.

##### 4.5.3.4. Selection of Plant Species for Green Belt Development

It is also recommended that the plantation has to be taken up randomly and the landscaping aspects could be taken into consideration. Multi-layered plantations comprising of medium height trees (7 m to 10 m) and shrubs (5 m height) are proposed for the green belt. Green belt is plantation of trees for reducing the air pollution as they absorb both gaseous and particulate pollutant, thus removing them from atmosphere. Green plants form a surface capable of absorbing air pollutants and forming sinks for pollutants. It improves the aesthetic value of local environment. Under

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present project, green belts have been planned with emphasis on creating biodiversity; enhance natural surroundings and mitigating pollution. Regional tree saplings in eco-friendly bags like *Pterocarpus marsupium*, *Pongamia pinnata*, *Limonia acidissima*, and *Cassia roxburghii* will be planted along the Lease boundary and avenues as well as over non-active dumps with intervals 3m in between with the GPS Coordinates. The greenbelt development plan aims to overall improvement in the environmental conditions of the region Native plant species will be preferred.

- The species should be wind-firm and deep-rooted.
- The species should form a dense canopy.
- Fast-growing plants will be planted
- Species tolerance to air pollution like SO<sub>2</sub> and NO<sub>2</sub> should be preferred.
- Plants having large leaf area index will be considered
- Soil improving plants (Nitrogen fixing rapidly decomposable leaf litter).
- Attractive appearance with good flowering and fruit-bearing.
- Birds and insects attract tree species.
- Roadsides will be planted with local vegetation.

**Table No 4.9. List of plant species proposed for Greenbelt development**

| S. No | Scientific name             | Tamil Name     |
|-------|-----------------------------|----------------|
| 1     | <i>Aegle marmelos</i>       | Vilva maram    |
| 2     | <i>Albizia lebbeck</i>      | Vaagai maram   |
| 3     | <i>Cassia fistula</i>       | Konrai tree    |
| 4     | <i>Lanea coromandelica</i>  | Othiyam        |
| 5     | <i>Limonia acidissima</i>   | Vila maram     |
| 6     | <i>Syzygium cumini</i>      | Naval maram    |
| 7     | <i>Toona ciliata</i>        | Santhana Vembu |
| 8     | <i>Ficus hispida</i>        | Aththi maram   |
| 9     | <i>Borassus flabellifer</i> | Panai-maram    |
| 10    | <i>Madhuca longifolia</i>   | Illupai maram  |

(\*Source: Term of Reference-ToR)

**Table No 4.10. Species suitable for abatement of noise and dust pollution**

| S. No | Botanical name            | Common name  |
|-------|---------------------------|--------------|
| 1     | <i>Azadirachta indica</i> | Vembhu maram |
| 2     | <i>Ficus religiosa</i>    | Arasan maram |
| 3     | <i>Ficus hispida</i>      | Aththi maram |
| 4     | <i>Bombax ceiba</i>       | Mul Elavu    |
| 5     | <i>Syzygium cumini</i>    | Naval maram  |
| 6     | <i>Tamarindus indica</i>  | Puliyamaram  |
| 7     | <i>Mangifera indica</i>   | Manga maram  |
| 8     | <i>Harwickia binata</i>   | Anjan maram  |

|    |                |                 |
|----|----------------|-----------------|
| 9  | Delonix regia  | Neruppu Kondrai |
| 10 | Cassia Fistula | Sara Kondrai    |

(\*Source: Guidance for Developing Green belts Manual, CPCB 2000)

The above-suggested list covers species with thick canopy cover, perennial green nature, native origin, and a large leaf area index. The proposed species will help in forming an effective barrier between the mine site area and the surroundings.

These species need to be planted along the periphery of the lease area for absorb fugitive emissions and noise levels which is generated during mining activities. All the open spaces, where tree plantation may not be possible, should be covered with shrubs and grass to prevent erosion of topsoil.

#### 4.5.4. Anticipated Impact on Fauna

- Noise generation due to vehicle may affect avifauna.
- The lease area is not inhabited by any wild life, as there is no forest cover, hence there will not be any effect on migration or extinction of wildlife.
- There is no National Park, Biosphere Reserve, Wildlife corridors, and Tiger/Elephant Reserve found within 10 km radius of the project site.

##### 4.5.4.1. Measures for protection and conservation of wildlife species

- Topsoil has a large number of seeds of native plant species in the mining area.
- Topsoil will be used for restoration and suitable surfaces for planted seedlings.
- Checks and controls the movement of vehicles in and out of the mine.
- Undertaking mitigative measures for a conducive environment to the flora and fauna in consultation with Forest Department.
- A dust suppression system will be installed within the mine and periphery of the mine.
- Plantation around the mine area will help in creating habitats for small faunal species and create a better environment for various fauna. Creating and developing awareness for nature and wildlife in the adjoining villages.

#### 4.5.3. Impact on Aquatic Biodiversity

- The major lake along the project sites doesn't have a rich biodiversity and almost all the species of both fauna and flora listed are either least concerned or not evaluated.
- There is no impact on fish habitats and the food WEB/ food chain in the water body and Reservoir.

**Table No. 4.11. Overall Ecological impact assessments of Kurumbapalayam Village, Sathyamangalam Taluk, Erode District.**

| S. No | Attributes   | Assessment  |
|-------|--|---|
|       | Activities of the project affect the breeding/nesting sites of birds and animals               | No breeding and nesting site was identified in the mining lease site. The fauna sighted mostly migrated from the buffer area. |
| 2     | Located near an area populated by rare or endangered species                                   | No Endangered, Critically Endangered, or vulnerable species were sighted in the core mining lease area.                       |
| 3     | Proximity to national park/wildlife sanctuary/reserve forest /mangroves/ coastline/estuary/sea | Veeramalai R.F.- 10.5km - SW  |



|    |   |  |
|----|---|--|
| 4  | The proposed project restricts access to waterholes for wildlife  | 'No '  |
| 5  | Proposed mining project impact surface water quality that also provides water to wildlife                           | 'No 'scheduled or threatened wildlife animals are sighted regularly core in the core area.   |
| 6  | Proposed mining project increase siltation that would affect nearby biodiversity areas.                             | Surface runoff management such as drains is constructed properly so there will be no siltation effect in the nearby mining area.     |
| 7  | Risk of fall/slip or cause death to wild animals due to project activities.   | 'No'   |
| 8  | The project release effluents into a water body that also supplies water to a wildlife.                             | No water body near to core zone so the chances of water becoming polluted is low.  |
| 9  | Mining projects affect the forest-based livelihood/ any specific forest product on which local livelihood depended. | 'No'   |
| 10 | The project likely to affect migration routes.  | 'No 'migration route was observed during the monitoring period.  |
| 11 | The project is likely to affect the flora of an area, which have medicinal value                                    | 'No'   |
| 12 | Forestland is to be diverted, has carbon high sequestration.  | 'No 'There was no forest land diverted.  |
| 13 | The project is likely to affect wetlands, Fish breeding grounds, and marine ecology.                                | 'No'. Wetland was not present in the near core Mining lease area. No breeding and nesting ground is present in the core mining area. |

(\*Source: EIA Guidance Manual-Mining and Minerals, 2010)

**Table No: 4.12. General Impacts vs. Mitigation Matrix**

| Particulars | Issues                               | Reason/Status in relation to the mine site   | Reference/Method  | Suggestions |
|-------------|--------------------------------------|--|---|-------------|
| Species     | Rare/ Endangered/ Threatened species | Not reported   | Field observation, interviews of local people   | <b>Nil</b>  |
|             | Endemic Species                      | No endemic species of any flora, fauna or wildlife are present in the study area.  | Field survey, Literature review   | <b>Nil</b>  |
|             | Protected Areas                      | No National Park, Wildlife Sanctuary, Tiger reserve, and Biosphere Reserve falls in the 10-km radius study area                  | ENVIS, Government of Tamil Nadu protected area website, Google Earth, Project Maps, etc.                    | <b>Nil</b>  |
|             | Important Bird Areas                 | No Important Bird Areas are falling in the 10-km radius area for Migratory Bird Habitat<br>Karaivetti Bird Sanctuary - 67.0km-NE | ENVIS Centre on Wildlife & Protected Areas, Important Bird Area in India, IBA Book (Birdlife International) | <b>Nil</b>  |
|             | Ramsar site                          | No Ramsar sites present in the surrounding area region   | Ramsar Web site   | <b>Nil</b>  |
|             | Wetlands of National Importance      | Nil  | ENVIS Centre on Wildlife & Protected Areas, Wetlands directory of Government of India                       | <b>Nil</b>  |
|             | Wetlands of International Importance | Nil  | Nil   | <b>Nil</b>  |

|                            |   |   |  |  |
|----------------------------|---|---|--|--|
| Important Natural Habitats | Wildlife Corridors                              | No Wildlife Corridor is falling in 10 km radius project study area  | Protected Areas, Consultation with local naturalists & authenticated location map.       | Nil  |
|                            | Eco-sensitive zone identified by the government | No Eco-sensitive zone is falling 10 km radius project study area  | ENVIS, Consultation with local naturalists & authenticated location map                  | Nil  |
|                            | Forest Areas                                    | No Reserve forest is falling in 10 km radius project study area<br>Veeramalai R.F.-10.5km - SW                              | ENVIS, Government of Tamil Nadu protected area website, Google Earth, Project Maps, etc. | NIL, Applicant will create the green belt plantation on the periphery of mine sites. |
|                            | Water bodies                                    | Tank - 100m- SW<br>Odai - 650m -SE<br>Tank - 2.5km -N<br>Napili Stream -2.8km -E<br>Mayanur Barage Right Canal - 6.2km - NE | Project Map and local maps, Google Earth   | Nil  |
|                            | Breeding/nesting areas                          | No breeding/Nesting site are falling in the study area  | Literature Survey Project Map and local maps, Google Earth                               | NIL  |

The 7.5m Safety distance along the boundary has been identified to be utilized for subsequent Afforestation. However, the afforestation should always be carried out in a systematic and scientific manner. Regional trees like Neem, Casuarina and Pongamia pinnata, etc. will be planted along the Lease boundary and avenue plantation will be carried out in the project site. Greenbelt development Plan is given in

**TABLE 4.13: GREENBELT DEVELOPMENT PLAN**

| Plantation Details | No. of trees provided | 1 <sup>st</sup> Year |
|--------------------|-----------------------|----------------------|
| No of plants       | 1150                  | 1150                 |
| Yearly             | 100%                  | 100%                 |

## 4.6 SOCIO ECONOMIC

### 4.6.1 Anticipated Impact

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

### 4.6.2 Mitigation Measures

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

- 
- Benefit to the State and the Central governments through financial revenues by way of royalty, tax, duties, etc., from this project directly and indirectly.
  - From above details, the quarry operations will have highly beneficial positive impact in the area

#### **4.7 OCCUPATIONAL HEALTH AND SAFETY**

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

- Respiratory hazards
- Noise
- Physical hazards
- Explosive storage and handling

##### **4.7.1 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

##### **4.7.2 Noise**

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

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

##### **4.7.3 Physical Hazards**

The following measures are proposed for control of physical hazards

- Specific personnel training on work-site safety management will be taken up;
- Work site assessment will be done by rock scaling of each surface exposed to workers to prevent accidental rock falling and / or landslide, especially after blasting activities;
- 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

##### **4.7.4 Occupational Health Survey**

All the persons will undergo pre-employment and periodic medical examination. Employees will be monitored for occupational diseases by conducting the following tests

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- General physical tests
- Audiometric tests
- Full chest, X-ray, Lung function tests, Spirometric tests
- Periodic medical examination – yearly
- Lung function test – yearly, those who are exposed to dust
- Eye test

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

#### **4.8 MINE WASTE MANAGEMENT**

No waste is anticipated, the entire mined out material will be sold to needy crushers and customers.

#### **4.9 MINE CLOSURE**

The ultimate depth of the mine is 41m bgl and the life of the mine is 5 years, after completion of mining operation the following action will be taken in the project site as a part of Mine closure plan

- The total Mined out land would be around 1.62.48Ha this land will be converted into temporary water reservoir which will facilitate to collect the rain water
- The stagnant water will be supplied to the nearby agriculture land during drought seasons
- Fencing will be re constructed around the pit after closure, the warning/ danger display board will be placed on all the sides of the project site
- The un utilized area and haul roads will be converted as plantation area, fruit bearing trees will be planted to retain the eco system of the area
- Final Mine closure plan will be prepared and submitted to the concerned authority

Mine closure plan is the most important environmental requirement in mining project. The mine closure plan should cover technical, environmental, social, legal and financial aspects dealing with progressive and post closure activities. The closure operation is a continuous series of activities starting from the decommissioning of the project.

As progressive mine closure is a continuous series of activities, it is obvious that the proposals of scientific mining have included most of the activities to be included in the closure plan. While formulating the closure objectives for the site, it is important to consider the existing or the pre-mining land use of the site; and how the operation will affect this activity.

The primary aim is to ensure that the following broad objectives along with the abandonment of the mine can be successfully achieved:

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

- 
- To overcome adverse socio-economic impacts.

#### **4.9.1 Mine Closure Criteria**

The criteria involved in mine closure are discussed below:

##### **4.9.1.1 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.,

##### **4.9.1.2 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.

##### **4.9.1.3 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 mine plan. The mine closure is a part of approved mine plan and activities of closure shall be carried out as per the process described in mine closure plan.

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## **5. ANALYSIS OF ALTERNATIVES (TECHNOLOGY AND SITE)**

### **5.0 INTRODUCTION**

Consideration of alternatives to a project proposal is a requirement of EIA process. During the scoping process, alternatives to a proposal 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 surrounding areas already undergone quarrying operation, there are no Crushers within the radius of 1km. Most of the quarries in the regions are abandoned and Existing quarries. Hence this quarry will feed the Rough stone material to the crushing units.

The Rough Stone and Gravel Quarry Project for excavation of Rough Stone, which is site specific. The proposed mining lease areas have 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 areas.
- Availability of skilled, semi-skilled and unskilled workers in this region.
- All the basic amenities such as medical, firefighting, education, transportation, communication and infrastructural facilities are well connected and accessible.
- The mining operations will not intersect the ground water level. Hence, no impact on ground water environment.
- Study 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 all the mine sites are mineral specific

### **5.3 FACTORS BEHIND SELECTION OF PROPOSED TECHNOLOGY**

The existing quarries in the area operated by Opencast Mechanised Mining operation with drilling and blasting method will be used to extract Rough Stone in the area. All the applied mining lease area shave following advantages –

- As the mineral deposition is homogeneous and batholith formation, therefore opencast method of working is preferred over underground method
- The material will be loaded with the help of excavators into dumpers / trippers and transported to the needy customers.
- Blasting and availability of drills along with controlled blasting technology gives desired fragmentation so that the mineral is handled safely and used without secondary blasting.
- 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 these projects. 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.

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## 6. ENVIRONMENTAL MONITORING PROGRAMME

### 6.0 GENERAL

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 as well as the conditions set forth under the order issued by Tamil Nadu Pollution Control Board while granting CTO.

### 6.1 METHODOLOGY OF MONITORING MECHANISM

Implementation of EMP and periodic monitoring will be carried out by the project proponent. A comprehensive monitoring mechanism has been devised for monitoring of impacts due to this 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 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.

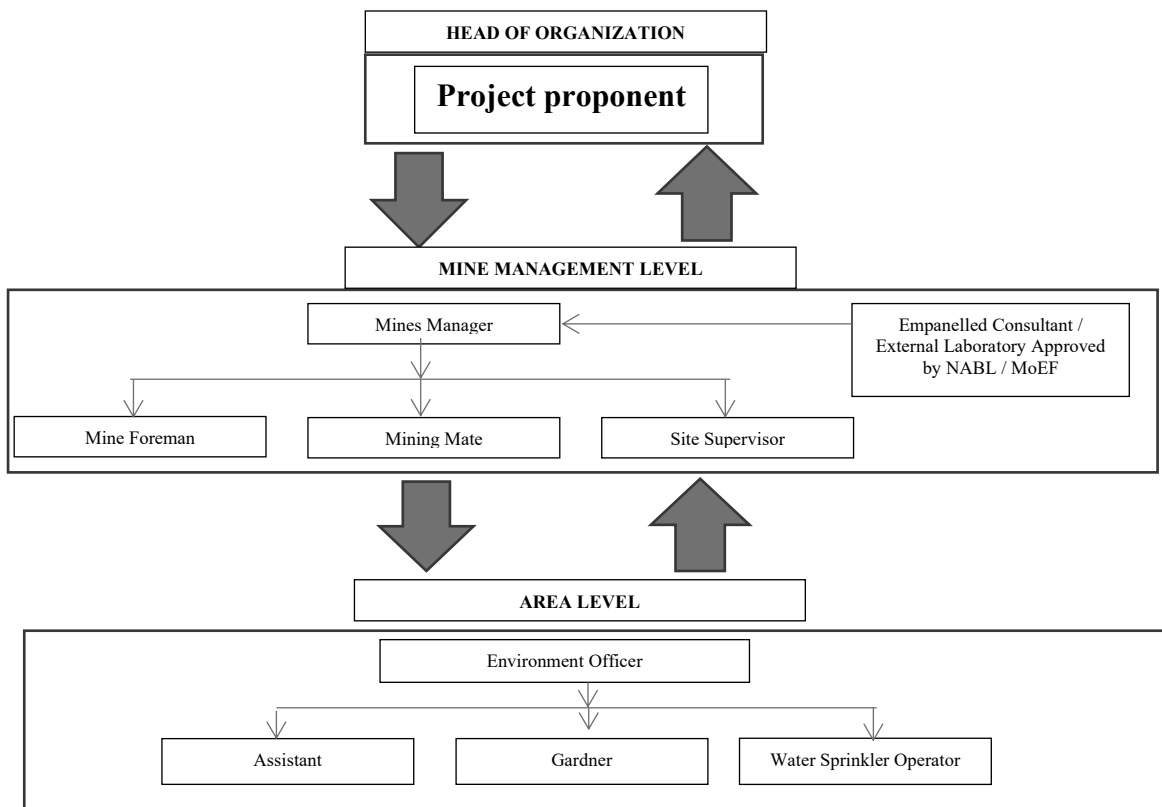
An Environment monitoring cell (EMC) will be constituted to monitor the implementation of EMP and other environmental protection measures in all the proposed quarries.

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 each proposed project proponent. The half-yearly reports are submitted to Ministry of Environment and Forest, Regional Office and SEIAA 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).

**FIGURE 6.1: PROPOSED ENVIRONMENTAL MONITORING CELL**

## 6.2 IMPLEMENTATION SCHEDULE OF MITIGATION MEASURES

The mitigation measures proposed in Chapter-4 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**

| SI 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

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 monitoring are detailed in Table 6.2

**TABLE 6.2: PROPOSED MONITORING SCHEDULE POST EC**

| S.No. | Environment Attributes   | Location   | Monitoring     |                              | Parameters  |
|-------|--------------------------|--|----------------|------------------------------|---|
|       |                          |  | Duration       | Frequency                    |   |
| 1     | Air Quality              | 2 Locations<br>(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<br>(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 bgl  |
| 5     | Noise                    | 2 Locations<br>(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<br>(1 Core & 1 Buffer)                                       | -              | Once in six months           | Physical and Chemical Characteristics   |
| 8     | Greenbelt                | Within the Project Area  | Daily          | Monthly                      | Maintenance   |

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

### 6.4 BUDGETARY PROVISION FOR EMP

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 capital cost for Environmental Monitoring Programme is Rs 76,000/- and the recurring cost is Rs 3,80,000/- per annum for Proposed Project.

**TABLE 6.3 ENVIRONMENT MONITORING PROGRAM BUDGET**

| PROPOSAL |               |              |                          |
|----------|---------------|--------------|--------------------------|
| Sl.No.   | Parameter     | Capital Cost | Recurring Cost per annum |
| 1        | Air Quality   | Rs. 76,000/- | Rs. 76,000/-             |
| 2        | Meteorology   |              |                          |
| 3        | Water Quality |              |                          |

|              |                 |                    |                    |
|--------------|-----------------|--------------------|--------------------|
| 4            | Hydrology       |                    |                    |
| 5            | Soil Quality    |                    |                    |
| 6            | Noise Quality   |                    |                    |
| 7            | Vibration Study |                    |                    |
| <b>Total</b> |                 | <b>Rs 76,000/-</b> | <b>Rs 76,000/-</b> |

Source: Approved Mining Plan

## 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.

## 7. ADDITIONAL STUDIES

### 7.0 GENERAL

The following Additional Studies were done as per items identified by project proponent and items identified by regulatory authority. And items identified by public and other stakeholders will be incorporated after Public Hearing.

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

### 7.1. PUBLIC CONSULTATION

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 is submitted along with this Draft EIA / EMP Report and the outcome of public hearing proceedings will be detailed in the Final EIA/EMP Report.

### 7.2 RISK ASSESSMENT

The methodology for the risk assessment has been based on the specific risk assessment guidance issued by the Directorate General of Mine Safety (DGMS), Dhanbad, vide Circular No.13 of 2002, dated 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 all proposed projects. Risk Assessment is all about prevention of accidents and to take necessary steps to prevent it from happening.

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 below Table 7.1.

**TABLE 7.1 RISK ASSESSMENT& CONTROL MEASURES**

| S. No | Risk factors   | Causes of risk                                | Control measures   |
|-------|--|---|--|
| 1     | Accidents due to explosives and heavy mining machineries | Improper handling and unsafe working practice | All safety precautions and provisions of Mine Act, 1952, Metalliferous Mines Regulation, 1961 and Mines Rules, 1955 will be strictly followed during all mining operations; Workers will be sent to the Training in the nearby Group Vocational Training Centre<br>Entry of unauthorized persons will be prohibited;<br>Fire-fighting and first-aid provisions in the mine office complex and mining area; |

|   |                |   |  |
|---|----------------|---|--|
|   |                |   | <p>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</p> <p>Working of quarry, as per approved plans and regularly updating the mine plans;</p> <p>Cleaning of mine faces on daily basis shall be daily done in order to avoid any overhang or undercut;</p> <p>Handling of explosives, charging and firing shall be carried out by competent persons only under the supervision of a Mine Manager;</p> <p>Maintenance and testing of all mining equipment as per manufacturer 's guidelines.</p>   |
| 2 | Drilling       | <p>Improper and unsafe practices</p> <p>Due to high pressure of compressed air, hoses may burst</p> <p>Drill Rod may break</p>  | <p>Safe operating procedure established for drilling (SOP) will be strictly followed.</p> <p>Only trained operators will be deployed.</p> <p>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,</p> <p>Drilling shall not be carried on simultaneously on the benches at places directly one above the other.</p> <p>Periodical preventive maintenance and replacement of worn-out accessories in the compressor and drill equipment as per operator manual.</p> <p>All drills unit shall be provided with wet drilling shall be maintained in efficient working in condition.</p> <p>Operator shall regularly use all the personal protective equipment.</p> |
| 4 | Blasting       | <p>Fly rock, ground vibration, Noise and dust.</p> <p>Improper charging, stemming &amp; Blasting/fining of blast holes</p> <p>Vibration due to movement of vehicles</p> | <p>Restrict maximum charge per delay as per regulations and by optimum blast hole pattern, vibrations will be controlled within the permissible limit and blasting can be conducted safely.</p> <p>SOP for Charging, Stemming &amp; Blasting/Firing of Blast Holes will be followed by blasting crew during initial stage of operation</p> <p>Shots are fired during daytime only.</p> <p>All holes charged on any one day shall be fired on the same day.</p> <p>The danger zone will be distinctly demarcated (by means of red flags)</p>  |
| 5 | 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>Before commencing work, drivers personally check the dumper/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.</p> <p>Not allow any unauthorized person to ride on the vehicle nor allow any unauthorized person to operate the vehicle.</p> <p>Concave mirrors should be kept at all corners</p>  |

|   |                                       |  |   |
|---|---------------------------------------|--|---|
|   |                                       | Operator of truck leaving his cabin when it is loaded. | All vehicles should be fitted with reverse horn with one spotter at every tipping point<br>Loading according to the vehicle capacity<br>Periodical maintenance of vehicles as per operator manual |
| 6 | Natural calamities                    | Unexpected happenings                                  | Escape Routes will be provided to prevent inundation of storm water<br>Fire Extinguishers & Sand Buckets  |
| 7 | 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 height.   |

Source: Analysed and proposed by FAE & EC

### 7.3 DISASTER MANAGEMENT PLAN

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

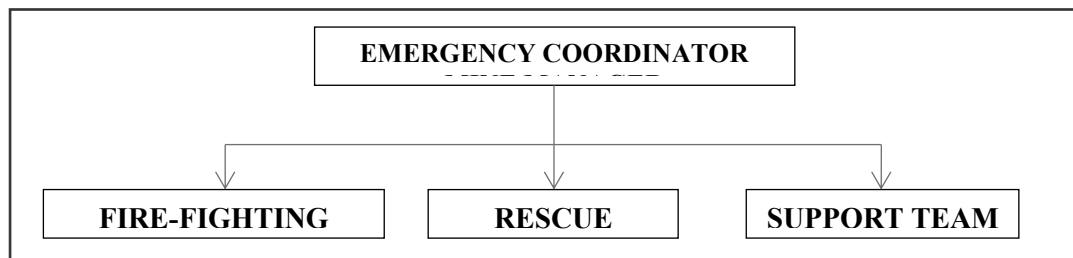
The Disaster Management Plan is aimed to ensure safety of life, protection of environment, protection of installation, restoration of production and salvage operations in this same order of priorities.

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 and the coordination among key personnel and their team has been shown in Fig 7.1.

**FIGURE 7.1: DISASTER MANAGEMENT TEAM LAYOUT**



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

**TABLE 7.2: PROPOSED TEAMS TO DEAL WITH EMERGENCY SITUATION**

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

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

### **Roles and responsibilities of emergency team –**

(a) Emergency coordinator (EC)

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

(b) Incident controller (IC)

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

(c) Communication and advisory team

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

(d) Roll call coordinator

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

(e) Search and rescue team

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

(f) Emergency security controller

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

### **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

#### **Proposed fire extinguishers at different locations –**

The following type of fire extinguishers has been proposed at strategic locations within the mine.

**TABLE 7.3: PROPOSED FIRE EXTINGUISHERS AT DIFFERENT LOCATIONS**

| <b>LOCATION</b>        | <b>TYPE OF FIRE EXTINGUISHERS</b>                                      |
|------------------------|--|
| Electrical Equipment's | CO <sub>2</sub> type, foam type, dry chemical powder type              |
| Fuel Storage Area      | CO <sub>2</sub> type, foam type, dry chemical powder type, Sand bucket |
| Office Area            | Dry chemical type, foam type   |

#### **Alarm system to be followed during disaster –**

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

## 7.4 CUMULATIVE IMPACT STUDY

For easy representation of Proposed and Existing Quarries in the Cluster are given unique codes and identifies and studied in this EIA EMP Report.

**TABLE 7.4: LIST OF QUARRIES WITHIN 500 METER RADIUS**

| PROPOSED QUARRY            |                       |                        |   |              |  |
|----------------------------|-----------------------|------------------------|---|--------------|--|
| CODE                       | Name of the Owner     | Village                | S.F. Nos                                  | Extent in Ha | Status   |
| P1                         | Thiru.N.T. Saisada    | Kurumbapalayam Village | 151(P) and 152/4                          | 2.28.40      | ToR Obtained:<br>File No.: 10788 ToR<br>Identification No.:<br>T024B0108TN5906337N<br>Dated: 31.05.2024. |
| P2                         | Thiru C.Raja          | Kurumbapalayam Village | 138/2A(P),1<br>38/3A(P) &<br>138/4P       | 1.41.96      | EC Granted vide Lr. No.<br>SEIAA-TN /F.No.9916 /1(a)<br>/EC. No: 6157 /2023,<br>dated:07.11.2023         |
| P3                         | Thiru.Thirunavukarasu | Kurumbapalayam Village | 148/1,148/1<br>1,148/12,14<br>8/13& 152/4 | 2.18.0       | Under Process  |
| P4                         | Thiru S.Veenish       | Kurumbapalayam Village | 178                                       | 2.96.50      | 487 <sup>th</sup> SEAC meeting for ToR<br>on 01.08.2024  |
| TOTAL EXTENT               |                       |                        |   | 8.84.86      |  |
| EXISTING QUARRY            |                       |                        |   |              |  |
| CODE                       | Name of the Owner     | Village                | S.F. Nos                                  | Extent in Ha | Status   |
| E-1                        | Thiru.N.T. Saisada    | Kurumbapalayam Village | 152/2 &<br>152/3                          | 1.64.5       | 23.12.2021 to 22.12.2026   |
| TOTAL EXTENT               |                       |                        |   | 1.64.5       |  |
| EXPIRED & ABANDONED QUARRY |                       |                        |   |              |  |
| Ex-1                       | Thiru.M.Ramasamy      | Kurumbapalayam Village | 139/2,139/3<br>139/4                      | 3.13.5       | 24.01.2014 to 23.01.2019   |
| TOTAL EXTENT               |                       |                        |   | 3.13.5       |  |
| TOTAL CLUSTER EXTENT       |                       |                        |   | 10.49.36     |  |

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



**TABLE 7.5: SALIENT FEATURES OF PROPOSAL “P1”**

|                              |  |                                  |                          |
|------------------------------|--|----------------------------------|--------------------------|
| Name of the Project          | Thiru.N.T. Saisada Rough stone and Gravel quarry   |                                  |                          |
| S.F. No.                     | 151(P) & 152/4   |                                  |                          |
| Extent                       | 2.28.40 ha   |                                  |                          |
| Village Taluk and District   | Kurumbapalayam Village, Sathiyamangalam Taluk, Erode District  |                                  |                          |
| Land Type                    | Proponent own patta land   |                                  |                          |
| Toposheet No                 | 58 - E/03  |                                  |                          |
| Latitude between             | <b>11°25'51.36"N to 11°25'55.19"N</b>  |                                  |                          |
| Longitude between            | <b>77°10'07.83"E to 77°10'18.95"E</b>  |                                  |                          |
| Elevation of the area        | 330m AMSL  |                                  |                          |
| Lease period                 | 10 Years   |                                  |                          |
| Mining Plan period           | 10 years   |                                  |                          |
| Proposed Depth of Mining     | 41m bgl (1m Gravel +10m Weathered Rock + 30m Rough Stone)  |                                  |                          |
|                              | Rough Stone in m <sup>3</sup>  | Weathered Rock in m <sup>3</sup> | Gravel in m <sup>3</sup> |
| Geological Resources         | 6,85,200   | 2,28,400                         | 22,840                   |
| Mineable Reserves            | 1,45,660   | 1,35,030                         | 15,582                   |
| Year wise Production         | 1,45,660   | 1,35,030                         | 15,582                   |
| Peak Production              | 16,820   | 49,000                           | 5,270                    |
| Ultimate Pit Dimension       | 294m (L) x 87m (W) x 41m(D) bgl  |                                  |                          |
| Water Level in the region    | 68 – 73 m bgl  |                                  |                          |
| Method of Mining             | Opencast Mechanized Mining Method involving small drilling and Controlled blasting using Slurry Explosives   |                                  |                          |
| Topography                   | The lease applied area is a Plain topography. The area has gentle sloping towards Southeastern side and altitude of the area is 330m (max) above from Mean Sea level. The area is covered by 1m thickness of Gravel, 10m thickness of weathered rocks and followed by Massive Charnockite which is clearly inferred from the existing quarry pit situated on the eastern side. |                                  |                          |
| Machinery proposed           | Jack Hammer  | 4 Nos                            |                          |
|                              | Compressor   | 1 No                             |                          |
|                              | Excavator with Bucket and Rock Breaker   | 1 No                             |                          |
|                              | Tipper   | 3 Nos                            |                          |
|                              | Water sprinkler  | 1 No                             |                          |
| Blasting Method              | Controlled Blasting Method by shot hole drilling and small dia of 25mm slurry explosive are proposed to be used for shattering and heaving effect for removal and winning of Rough Stone. No deep hole drilling is proposed.   |                                  |                          |
| Proposed Manpower Deployment | 27 Nos   |                                  |                          |
| Project Cost                 | Rs. 84,20,000/-  |                                  |                          |
| EMP Cost                     | Rs.7,60,000/-  |                                  |                          |
| Total Project cost           | Rs.91,80,000/-   |                                  |                          |
| CER Cost                     | Rs.5,00,000/-  |                                  |                          |
| Nearby Water Bodies          | Odai   | 180m – South                     |                          |
|                              | Odai   | 650m_NW                          |                          |
|                              | Lower Bhavani Main Canal   | 3.7Km_N                          |                          |
|                              | Bhavanisagar Dam   | 5Km_NW                           |                          |

|                             |   |          |
|-----------------------------|---|----------|
|                             | Bhavani River   | 5Km N    |
|                             | Kavalaipalayam Lake   | 6.5Km SE |
|                             | Odai  | 6.7Km SE |
|                             | Thenkarai Kulam   | 9.3Km SW |
| Greenbelt Development Plan  | Proposed to plant 1,150 Nos of trees considering 500 Nos of trees/ Ha criteria<br>The plantation will be developed around the project site and nearby village roads |          |
| Proposed Water Requirement  | 2.3 KLD   |          |
| Nearest Habitation          | 550m – SW   |          |
| Nearest Reserve Forest      | Velamundi – 60m – North West  |          |
| Nearest Wild Life Sanctuary | Sathiyamangalam Tiger Reserve- 8.77km – North West  |          |

Source: Approved Mining Plan

**TABLE 7.6: SALIENT FEATURES OF PROPOSAL “P1”**

|                            |  |                                  |                          |
|----------------------------|--|----------------------------------|--------------------------|
| Name of the Project        | <b>Thiru. C. Raja</b> Rough stone and Gravel quarry  |                                  |                          |
| S.F. No.                   | 138/2A (P), 138/3A (P) & 138/4 (P)   |                                  |                          |
| Extent                     | 1.41.96 ha   |                                  |                          |
| Village Taluk and District | Kurumbapalayam Village, Sathiyamangalam Taluk, Erode District  |                                  |                          |
| Toposheet No               | 58 - E/03  |                                  |                          |
| Latitude between           | <b>11°25'37.78"N to 11°25'41.55"N</b>  |                                  |                          |
| Longitude between          | <b>77°10'01.38"E to 77°10'06.08"E</b>  |                                  |                          |
| Lease period               | 5 Years  |                                  |                          |
| Mining Plan period         | 5 years  |                                  |                          |
| Proposed Depth of Mining   | 40m BGL  |                                  |                          |
|                            | Rough Stone in m <sup>3</sup>  | Weathered Rock in m <sup>3</sup> | Gravel in m <sup>3</sup> |
| Geological Resources       | 4,62,710   | 26,904                           | 13,179                   |
| Mineable Reserves          | 1,19,897   | 15,780                           | 7,230                    |
| Year wise Production       | 1,19,897   | 15,780                           | 7,230                    |
| Peak Production            | 26,080   | 9,492                            | 4,526                    |
| Ultimate Pit Dimension     | 93m (L) x 121m (W) x 40m(D) bgl  |                                  |                          |
| Water Level in the region  | 70 – 65 m bgl  |                                  |                          |
| Method of Mining           | Opencast Mechanized Mining Method involving small drilling and Controlled blasting using Slurry Explosives   |                                  |                          |
| Topography                 | The lease applied area is a Plain topography. The area has gentle sloping towards East side and altitude of the area is 314m (max) above from Mean Sea level. The area is covered by 2m thickness of Gravel, 3m thickness of weathered rocks and followed by Massive Charnockite which is clearly inferred from the existing quarry pit. |                                  |                          |
| Machinery proposed         | Jack Hammer  | 3 Nos                            |                          |
|                            | Compressor   | 1 No                             |                          |
|                            | Excavator with Bucket and Rock Breaker   | 1 No                             |                          |
|                            | Tipper   | 2 Nos                            |                          |

|                              |  |
|------------------------------|--|
| Blasting Method              | Controlled Blasting Method by shot hole drilling and small dia of 25mm slurry explosive are proposed to be used for shattering and heaving effect for removal and winning of Rough Stone. No deep hole drilling is proposed. |
| Proposed Manpower Deployment | 18 Nos   |
| Project Cost                 | Rs. 37,90,000/-  |
| EMP Cost                     | Capital Cost - Rs. 22,21,292/- & Recurring Cost – Rs. 13,99,896/-  |
| CER Cost                     | Rs.5,00,000/-  |
| Greenbelt Development Plan   | Proposed to plant 700 Nos of trees considering 500 Nos of trees/ Ha criteria<br>The plantation will be developed around the project site and nearby village roads  |
| Proposed Water Requirement   | 1.2 KLD  |

**TABLE 7.7: SALIENT FEATURES OF PROPOSAL “E1”**

|                              |   |                                  |                       |
|------------------------------|---|----------------------------------|-----------------------|
| Name of the Quarry           | Thiru. N. T. Saisada Rough Stone & Gravel Quarry                  |                                  |                       |
| S.F. No.                     | 152/2 & 152/3   |                                  |                       |
| Extent                       | 1.64.5 Ha   |                                  |                       |
| Latitude between             | 11°25'52.86"N to 11°25'55.86"N                                    |                                  |                       |
| Longitude between            | 77°10'11.98"E to 77°10'19.13"E                                    |                                  |                       |
| Geological Resources         | Rough Stone in m <sup>3</sup>                                     | Weathered Rock (m <sup>3</sup> ) | Gravel m <sup>3</sup> |
|                              | 4,11,250  | 32,900                           | 49,350                |
| Mineable Reserves            | 1,18,400  | 19,344                           | 35,685                |
| Yearwise Production          | 1,12,720  | 19,344                           | 35,685                |
| Ultimate Pit Dimension       | 196m (L) X 63m (W) X 30m (D)                                      |                                  |                       |
| Method of Mining             | Opencast Mechanized Mining Method involving drilling and blasting |                                  |                       |
| Machinery proposed           | Jack Hammer   | 4 Nos                            |                       |
|                              | Compressor  | 1 No                             |                       |
|                              | Hydraulic Excavator   | 1 No                             |                       |
|                              | Tippers   | 2 Nos                            |                       |
| Proposed Manpower Deployment | 21 Nos  |                                  |                       |
| Project Cost                 | Rs.35.88 Lakhs  |                                  |                       |
| CER Cost                     | Rs.0.80 Lakhs   |                                  |                       |

Source: Approved Mining Plan

The Cumulative Impact is mainly anticipated due to drilling & blasting and excavation and transportation activities in all the quarries (proposed and existing) within the cluster and major impact anticipated is on Air & Noise Environment and Ground Vibrations due to blasting.

**Air Environment –**

Calculating the Cumulative Load of Mining within the cluster is as shown in table 7.8 & 7.12.

**TABLE 7.8: CUMULATIVE PRODUCTION LOAD OF ROUGH STONE**

| Quarry             | Year wise production | Per Year Production in m <sup>3</sup> | Per Day Production in m <sup>3</sup> | Number of Lorry Load Per Day |
|--------------------|----------------------|---------------------------------------|--------------------------------------|------------------------------|
| P1<br>(Ten Years)  | 1,45,660             | 14,566                                | 49                                   | 4                            |
| P2<br>(Five Years) | 1,19,897             | 23,979                                | 80                                   | 7                            |
| <b>Total</b>       | <b>2,65,557</b>      | <b>38,545</b>                         | <b>129</b>                           | <b>11</b>                    |
| E1<br>(Five Years) | 1,12,720             | 22,544                                | 75                                   | 6                            |
| <b>Total</b>       | <b>1,12,720</b>      | <b>22,544</b>                         | <b>75</b>                            | <b>6</b>                     |
| <b>Grand Total</b> | <b>3,78,277</b>      | <b>61,089</b>                         | <b>204</b>                           | <b>17</b>                    |

**TABLE 7.9: CUMULATIVE PRODUCTION LOAD OF GRAVEL**

| Quarry             | Production for Three - Year plan period | Per Year Production in m <sup>3</sup> | Per Day Production in m <sup>3</sup> | Number of Lorry Load Per Day |
|--------------------|---|---------------------------------------|--------------------------------------|------------------------------|
| P1                 | 15,582                                  | 5,194                                 | 17                                   | 2                            |
| P2                 | 7,230                                   | 2,410                                 | 8                                    | 1                            |
| <b>Total</b>       | <b>22,812</b>                           | <b>7,604</b>                          | <b>25</b>                            | <b>3</b>                     |
| E1                 | 35,685                                  | 11,895                                | 40                                   | 3                            |
| <b>Total</b>       | <b>35,685</b>                           | <b>11,895</b>                         | <b>40</b>                            | <b>3</b>                     |
| <b>Grand Total</b> | <b>58,497</b>                           | <b>19,499</b>                         | <b>65</b>                            | <b>6</b>                     |

**TABLE 7.10: CUMULATIVE PRODUCTION LOAD OF WEATHERED ROCK**

| Quarry             | Production for Three - Year plan period | Per Year Production in m <sup>3</sup> | Per Day Production in m <sup>3</sup> | Number of Lorry Load Per Day |
|--------------------|---|---------------------------------------|--------------------------------------|------------------------------|
| P1                 | 1,35,030                                | 45,010                                | 150                                  | 13                           |
| P2                 | 15,780                                  | 5,260                                 | 18                                   | 2                            |
| <b>Total</b>       | <b>1,50,810</b>                         | <b>50,270</b>                         | <b>168</b>                           | <b>15</b>                    |
| E1                 | 35,685                                  | 11,895                                | 40                                   | 3                            |
| <b>Total</b>       | <b>35,685</b>                           | <b>11,895</b>                         | <b>40</b>                            | <b>3</b>                     |
| <b>Grand Total</b> | <b>1,86,495</b>                         | <b>62,165</b>                         | <b>208</b>                           | <b>18</b>                    |

On a cumulative basis considering the proposed quarries, it can be seen that the overall production of Rough Stone is 204m<sup>3</sup> per day with a capacity of 17trips of Rough Stone per day from the cluster.

**Note:** Per day production of Rough Stone is calculated for 5/10 Years Lease Period and the load of existing quarries is covered under existing environment of the cluster.

Based on the above production quantities the emissions due to various activities in all the mines includes various activities like ground preparation, excavation, handling and transport of ore. These activities have been analysed systematically basing on USEPA-Emission Estimation Technique Manual, for Mining AP-42, to arrive at possible emissions to the atmosphere and estimated emissions are given in Table 7.10.

**TABLE 7.11: EMISSION ESTIMATION FROM QUARRIES WITHIN 500 METER RADIUS**

| EMISSION ESTIMATION FOR QUARRY "P1" |
|-------------------------------------|
|-------------------------------------|

|   | Activity                                     | Source type  | Value        | Unit        |
|---|--|--------------|--------------|-------------|
|   | Estimated Emission Rate for PM <sub>10</sub> | Drilling     | Point Source | 0.091142629 |
| Blasting                                    |  | Point Source | 0.001521326  | g/s         |
| Mineral Loading                             |  | Point Source | 0.042896044  | g/s         |
| Haul Road                                   |  | Line Source  | 0.002493192  | g/s/m       |
| Overall Mine                                |  | Area Source  | 0.055245325  | g/s         |
| Estimated Emission Rate for SO <sub>2</sub> |  | Overall Mine | Area Source  | 0.000765343 |
| Estimated Emission Rate for NO <sub>x</sub> | Overall Mine                                 | Area Source  | 0.000039376  | g/s         |
| <b>EMISSION ESTIMATION FOR QUARRY "P2"</b>  |  |              |              |             |
|   | Activity                                     | Source type  | Value        | Unit        |
|   | Estimated Emission Rate for PM <sub>10</sub> | Drilling     | Point Source | 0.075778617 |
| Blasting                                    |  | Point Source | 0.000604433  | g/s         |
| Mineral Loading                             |  | Point Source | 0.040508733  | g/s         |
| Haul Road                                   |  | Line Source  | 0.002488382  | g/s/m       |
| Overall Mine                                |  | Area Source  | 0.044831957  | g/s         |
| Estimated Emission Rate for SO <sub>2</sub> |  | Overall Mine | Area Source  | 0.000413413 |
| Estimated Emission Rate for NO <sub>x</sub> | Overall Mine                                 | Area Source  | 0.000013696  | g/s         |
| <b>EMISSION ESTIMATION FOR QUARRY "E1"</b>  |  |              |              |             |
|   | Activity                                     | Source type  | Value        | Unit        |
|   | Estimated Emission Rate for PM <sub>10</sub> | Drilling     | Point Source | 0.071268504 |
| Blasting                                    |  | Point Source | 0.000444736  | g/s         |
| Mineral Loading                             |  | Point Source | 0.040587744  | g/s         |
| Haul Road                                   |  | Line Source  | 0.002488505  | g/s/m       |
| Overall Mine                                |  | Area Source  | 0.047534200  | g/s         |
| Estimated Emission Rate for SO <sub>2</sub> |  | Overall Mine | Area Source  | 0.000412332 |
| Estimated Emission Rate for NO <sub>x</sub> | Overall Mine                                 | Area Source  | 0.000015593  | g/s         |

Source: Emission Calculation

**TABLE 7.12: INCREMENTAL & RESULTANT GLC WITHIN CLUSTER**

| <b>PM<sub>10</sub> in µg/m<sup>3</sup></b>  |                             |
|---|-----------------------------|
| Background                                  | 42.7                        |
| Incremental                                 | 41.3                        |
| Resultant                                   | 44.4                        |
| NAAQ Norms                                  | <b>100 µg/m<sup>3</sup></b> |
| <b>PM<sub>2.5</sub> in µg/m<sup>3</sup></b> |                             |
| Background                                  | 21.4                        |
| Incremental                                 | 17.6                        |
| Resultant                                   | 20.4                        |
| NAAQ Norms                                  | <b>60 µg/ m<sup>3</sup></b> |
| <b>So<sub>2</sub> in µg/m<sup>3</sup></b>   |                             |
| Background                                  | 7.1                         |
| Incremental                                 | 5.6                         |
| Resultant                                   | 8.7                         |
| NAAQ Norms                                  | <b>80 µg/ m<sup>3</sup></b> |
| <b>No<sub>2</sub> in µg/m<sup>3</sup></b>   |                             |
| Background                                  | 23.9                        |
| Incremental                                 | 22.1                        |
| Resultant                                   | 26.1                        |

|            |   |
|------------|---|
| NAAQ Norms | <b>80 <math>\mu\text{g}/\text{m}^3</math></b> |
|------------|---|

**Noise Environment –**

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

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

$$Lp_2 = Lp_1 - 20 \log (r_2/r_1) - Ae_{1,2}$$

Where:

$Lp_1$  &  $Lp_2$  are sound levels at points located at distances  $r_1$  &  $r_2$  from the source.

$Ae_{1,2}$  is the excess attenuation due to environmental conditions. Combined effect of all sources can be determined at various locations by logarithmic addition.

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

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

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

**TABLE 7.13: PREDICTED NOISE INCREMENTAL VALUES FROM CLUSTER**

| Location ID        | Background Value (Day) dB(A) | Incremental Value dB(A) | Total Predicted dB(A) | Residential Area Standards dB(A) |
|--------------------|------------------------------|-------------------------|-----------------------|----------------------------------|
| Habitation Near P1 | 53.2                         | 56.6                    | 58.2                  | 55                               |
| Habitation Near P2 | 50.1                         | 54.6                    | 52.35                 |                                  |
| Habitation Near E1 | 55.0                         | 56.9                    | 55.95                 |                                  |

Source: Lab Monitoring Data

The incremental noise level is found within the range of 24.7-51.3dB (A) in Buffer zone. The noise level at different receptors in buffer zone is lower due to the distance involved and other topographical features adding to the noise attenuation. The resultant Noise level due to monitored values and calculated values at the receptors are based on the mathematical formula considering attenuation due to Green Belt as 4.9 dB (A) the barrier effect. From the above table, it can be seen that the ambient noise levels at all the locations near habitations are within permissible limits of Residential Area (buffer zone) as per THE NOISE POLLUTION (REGULATION AND CONTROL) RULES, 2000(The Principal Rules were published in the Gazette of India, vide S.O.123(E), dated 14.2.2000 and subsequently amended vide S.O. 1046(E),dated 22.11.2000, S.O. 1088(E), dated 11.10.2002, S.O. 1569 (E), dated19.09.2006 and S.O. 50 (E) dated 11.01.2010 under the Environment(Protection) Act, 1986).

#### Ground Vibrations

Ground vibrations due to mining activities in the all the 6 Mines within cluster are anticipated due to operation of Mining Machines like Excavators, drilling and blasting, transportation vehicles, etc. However, the major source of ground vibration from the all the 6 mines is blasting. The major impact of the ground vibrations is observed on the domestic houses located in the villages nearby the mine lease area. The kuchha houses are more prone to cracks and damage due to the vibrations induced by blasting whereas RCC framed structures can withstand more ground vibrations. Apart from this, the ground vibrations may develop a fear factor in the nearby settlements nearby the mining areas and may cause injury to persons or damage to the structures. Nearest Habitations from 6 mines respectively are as in below Table 7.21.

**TABLE 7.14: NEAREST HABITATION FROM EACH MINE**

| Location ID        | Distance & Direction |
|--------------------|----------------------|
| Habitation Near P1 | 550m - SW            |
| Habitation Near P2 | 330m- SW             |
| Habitation Near E1 | 680m- SW             |

The ground vibrations due to the blasting in all the mines are calculated using the empirical equation for assessment of peak particle velocity (PPV) is:

$$V = K [R/Q^{0.5}]^{-B}$$

Where –

V = peak particle velocity (mm/s)

K = site and rock factor constant

Q = maximum instantaneous charge (kg)

B = constant related to the rock and site (usually 1.6)

R = distance from charge (m)

**TABLE 7.15: GROUND VIBRATIONS AT MINES**

| Location ID | Maximum Charge in kgs | Nearest Habitation in m | PPV in m/ms |
|-------------|-----------------------|-------------------------|-------------|
| P1          | 20                    | 550m - SW               | 0.227       |
| P2          | 15                    | 330m- SW                | 0.408       |
| E1          | 15                    | 680m- SW                | 0.128       |

Source: Blasting Calculations

From the above table, the charge per blast is considered as maximum in each mine and the resultant PPV is well below the Peak Particle Velocity of 8 mm/s as per Directorate General of Mines Safety for safe level criteria through Circular No. 7 dated 29/8/1997.

#### Socio Economic Environment –

The 6 mines shall contribute towards CER and the community shall develop.

**TABLE 7.16: SOCIO ECONOMIC BENEFITS FROM MINES**

| Location ID  | Project Cost             | CER                   |
|--------------|--------------------------|-----------------------|
| P1           | Rs. 84,20,000/-          | Rs.5,00,000           |
| P2           | Rs. 37,90,000/-          | Rs.5,00,000           |
| E1           | Rs. 35,88,000/-          | Rs. 80,000/-          |
| <b>Total</b> | <b>Rs. 1,57,98,000/-</b> | <b>Rs.10,80,000/-</b> |

As per para 6 (II) of the office memorandum, all the mines being a green field project & Capital Investment is ≤ 100 crores, they shall contribute 2% of Capital Investment towards CER as per directions of EAC/SEAC.

- Proposed Projects shall fund towards CER – **Rs 5,00,000/-**

**TABLE 7.17: EMPLOYMENT BENEFITS FROM MINES**

| Description        | Employment |
|--------------------|------------|
| P1                 | 27         |
| P2                 | 18         |
| <b>Total</b>       | <b>45</b>  |
| E1                 | 21         |
| <b>Total</b>       | <b>21</b>  |
| <b>Grand Total</b> | <b>66</b>  |

A total of 27 people will get employment due to 1 proposed mine in cluster and 18 people are already employed at existing mines.

**TABLE 7.18: GREENBELT DEVELOPMENT BENEFITS FROM 2MINES**

| CODE           | No of Trees proposed to be planted | Survival % | Area Covered Sq.m   | Name of the Species                      |
|----------------|------------------------------------|------------|---|--|
| P1             | 1,150                              | 100%       | The safety zone along the boundary barrier has been identified to be utilized for Greenbelt development | Neem, Pongamia pinnata, Casuarina, etc., |
| P2             | 700                                |            |   |  |
| <b>Total</b>   | <b>1,850</b>                       |            |   |  |
| E1             | 820                                |            |   |  |
| <b>Total</b>   | <b>820</b>                         |            |   |  |
| <b>G.Total</b> | <b>2,670</b>                       |            |   |  |

Based on the Proposed Mining Plans it's anticipated that there shall growth of native species of Neem, Pinnata Casuarina, etc., in the Cluster at a rate of 2,670 Trees Planted over a period of life of mines.



## 7.5 PLASTIC WASTE MANAGEMENT PLAN

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.

### 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.

**TABLE 7.19: ACTION PLAN TO MANAGE PLASTIC WASTE**

| Sl.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 FAE's and EC

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## 8.PROJECT BENEFITS

### 8.0 GENERAL

The Proposed Project for Quarrying Rough Stone and Gravel at Kurumbapalayam Village aims to produce 1,45,660m<sup>3</sup> Rough Stone over a period of 10 years and 1,35,030m<sup>3</sup> of Weathered Rock & 15,582m<sup>3</sup> of Gravel over a period of 3 years. This will enhance the socio-economic activities in the adjoining areas and will result in the following benefits.

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

### 8.1 EMPLOYMENT POTENTIAL

It is proposed to provide employment to about 27 persons for carrying out mining operations and give preference to the local people in providing employment in the three proposed quarries in the cluster. In addition, there will be opportunity for indirect employment to many people in the form of contractual jobs, business opportunities, service facilities etc. the economic status of the local people will be enhanced due to mining project.

### 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 quarries are located in Kurumbapalayam Village, Sathiyamangalam Taluk, Erode District of Tamil Nadu and the area have communications, roads and other facilities already well established. The following physical infrastructure facilities will further improve due to proposed mine.

- 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.,

### CORPORATE SOCIAL RESPONSIBILITY

The Project Proponent 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.

#### CSR Cost Estimation

- CSR activities will be taken up in the Kurumbapalayam Village mainly contributing to education, health, training of women self-help groups and contribution to infrastructure etc., CSR budget is allocated as 2.5% of the profit.

### CORPORATE ENVIRONMENT RESPONSIBILITY

For the existing quarries 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.

Proponent intends to spent Rs 5,00,000/- towards CER for the Government School near the project site the details are given below:

**TABLE 8.1 CER – ACTION PLAN**

| Activity   | CER           |
|--|---------------|
| <ul style="list-style-type: none"> <li>• Renovation/ Construction of Existing Toilet</li> <li>• Providing Environmental Related books to the school Library</li> <li>• Carrying out plantation and maintenance in the school Ground</li> <li>• Any other requirements in consultation with the school Head master</li> </ul> | Rs 5,00,000/- |

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## **9. ENVIRONMENTAL COST BENEFIT ANALYSIS**

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

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## **10. 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 of 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 Thiru.N.T. Saisada 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 programmes 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.

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

The Environment Monitoring Cell discussed under Chapter 6 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 programme
- 
-

- Compliance to statutory provisions, norms of State Pollution Control Board, Ministry of Environment and Forests and the conditions of the environmental clearance as well as the consents to establish and consents to operate.

## 10.2. LAND ENVIRONMENT MANAGEMENT –

Landscape of the area will be changed due to the quarrying operation, restoration of the land by converting the quarry pit into temporary reservoir and the remaining part of the area (un utilized areas, infrastructure, haul Roads) will be utilized for greenbelt development. There is no major vegetation in the project area during the course of quarrying operation and after completion of the quarrying operation thick plantation will be developed under greenbelt development programme.

**TABLE 10.1. PROPOSED CONTROLS FOR LAND ENVIRONMENT**

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

Source: Proposed by FAE's & EIA Coordinator

## 10.3. SOIL MANAGEMENT

There overburden in the form of Gravel which will directly loaded into tippers for the filling and levelling of low-lying areas.

**TABLE 10.2. PROPOSED CONTROLS FOR SOIL MANAGEMENT**

| CONTROL   | RESPONSIBILITY             |
|---|----------------------------|
| Surface run-off from the project boundary via garland drains will be diverted to the mine pits                    | Mine Foreman & Mining Mate |
| Design haul roads and other access roads with drainage systems to minimize concentration of flow and erosion risk | Mines Manager              |
| Empty sediment from sediment traps<br>Maintain, repair or upgrade garland drain system                            | Mines Manager              |
| Test soils for pH, EC, chloride, size & water holding capacity  | Manager Mines              |

Source: Proposed by FAE's & EIA Coordinator

#### 10.4. WATER MANAGEMENT

In the proposed quarrying project, no process is involved for the effluent generation, only oil & grease from the machinery wash is anticipated and domestic sewage from mine office. The quarrying operation is proposed up to a depth of 41m BGL, the water table in the area is 68m – 73m below ground level, hence the proposed projects will not intersect the Ground water table during entire quarry period.

**TABLE 10.3. PROPOSED CONTROLS FOR WATER ENVIRONMENT**

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

Source: Proposed by FAE's & EIA Coordinator

#### 10.5. AIR QUALITY MANAGEMENT

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

**TABLE 10.4. PROPOSED CONTROLS FOR AIR ENVIRONMENT**

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

Source: Proposed by FAE's & EIA Coordinator

## 10.6. NOISE POLLUTION CONTROL

There will be intermittent noise levels due to vehicular movement, trucks loading, drilling and blasting and cutting activities. No mining activities are planned during night time.

**TABLE 10.5.: PROPOSED CONTROLS FOR NOISE ENVIRONMENT**

| CONTROL  | RESPONSIBILITY |
|--|----------------|
| Development of thick greenbelt all along the Buffer Zone (7.5 Meters) of the project area to attenuate the noise and the same will be maintained   | Mines Manager  |
| Preventive maintenance of mining machinery and replacement of worn-out accessories to control noise generation   | Mines Foreman  |
| Deployment of mining equipment with an inbuilt mechanism to reduce noise   | Mines Manager  |
| Provision of earmuff / ear plugs to workers working in noise prone zones in the mines  | Mining Mate    |
| Provision of effective silencers for mining machinery and transport vehicles   | Mines Manager  |
| Provision of sound proof AC operator cabins to HEMM  | Mines Manager  |
| Sharp drill bits are used to minimize noise from drilling  | Mines Foreman  |
| Controlled blasting technologies are adopted by using delay detonators to minimize noise from blasting   | Mines Manager  |
| Annual ambient noise level monitoring is carried out in the project area and in surrounding villages to assess the impact due to the mining activities and the efficacy of the adopted noise control measures. Additional noise control measures will be adopted if required as per the observations during monitoring | Mines Manager  |
| Reduce maximum instantaneous charge using delays while blasting  | Mining Mate    |
| Change the burden and spacing by altering the drilling pattern and/or delay layout, or altering the hole inclination   | Mines Manager  |
| Undertake noise or vibration monitoring  | Mines Manager  |

Source: Proposed by FAE's & EIA Coordinator

## 10.7. GROUND VIBRATION AND FLY ROCK CONTROL

The Rough stone quarry operation creates vibration due to the blasting and movement of Heavy Earth moving machineries, fly rocks due to the blasting.

**TABLE 10.6.: PROPOSED CONTROLS FOR GROUND VIBRATIONS & FLY ROCK – P1**

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

Source: Proposed by FAE's & EIA Coordinator



## 10.8. BIOLOGICAL ENVIRONMENT MANAGEMENT

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

Following control measures are proposed for its management and will be the responsibility of the Mines Manager.

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

### 10.8.1. Green Belt Development Plan

About 540nos. of saplings is proposed to be planted for the Mining plan period in safety barrier of applied mine lease area. The greenbelt development plan has been prepared keeping in view the land use changes that will occur due to mining operation in the area.

**TABLE 10.7: PROPOSED GREENBELT ACTIVITIES**

| Plantation Details | Required |
|--------------------|----------|
| No of plants       | 1,150    |
| Yearly             | 100%     |

- ✓ From the total numbers of 1,150trees, 800trees can be planted in two rows at 3m spacing within the safety barrier.
- ✓ The remaining 350 trees are proposed to be planted on village roads and schools.

The objectives of the greenbelt development plan are –

- Provide a green belt around the periphery of the quarry area to combat the dispersal of dust in the adjoining areas,
- Protect the erosion of the soil, Conserve moisture for increasing ground water recharging,
- Restore the ecology of the area, restore aesthetic beauty of the locality and meet the requirement of fodder, fuel and timber of the local community.

A well-planned Green Belt with multi rows (three tiers) preferably with long canopy leaves shall be developed with dense plantations around the boundary and haul roads to prevent air, dust noise propagation to undesired places and efforts will be taken for the enhancement of survival rate.

### 9.8.2. Species Recommended for Plantation

Following points have been considered while recommending the species for plantation:

- Creating of bio-diversity.
- Fast growing, thick canopy cover, perennial and evergreen large leaf area,
- Efficient in absorbing pollutants without major effects on natural growth

**TABLE 10.8. RECOMMENDED SPECIES FOR THE PLANTATION**

| S.No | Botanical Name              | Local Name     |
|------|-----------------------------|----------------|
| 1    | <i>Aegle marmelos</i>       | Vilvamaram     |
| 2    | <i>Albizia lebbeck</i>      | Vaagai maram   |
| 3    | <i>Cassia fistula</i>       | Konrai tree    |
| 4    | <i>Lannea coromandelica</i> | Othiyam        |
| 5    | <i>Limoniaacidissima</i>    | Vila maram     |
| 6    | <i>Syzygiumcumini</i>       | Naval maram    |
| 7    | <i>Toona ciliata</i>        | Santhana Vembu |
| 8    | <i>Ficus hispida</i>        | Aththimaram    |
| 9    | <i>Borassus flabellifer</i> | Panai-maram    |

Source: Proposed by FAE's & EIA Coordinator

## 10.9. OCCUPATIONAL SAFETY & HEALTH MANAGEMENT

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

### 10.9.1. Medical Surveillance and Examinations –

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

- General Physical Examination and Blood Pressure
- X-ray Chest and ECG
- Sputum test
- Detailed Routine Blood and Urine examination

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

**TABLE 10.9. MEDICAL EXAMINATION SCHEDULE**

| Sl.No | Activities                                     | 1 <sup>st</sup> Year | 2 <sup>nd</sup> Year | 3 <sup>rd</sup> Year | 4 <sup>th</sup> Year | 5 <sup>th</sup> Year |
|-------|--|----------------------|----------------------|----------------------|----------------------|----------------------|
| 1     | Initial Medical Examination (Mine Workers)     |                      |                      |                      |                      |                      |
| A     | Physical Check-up                              |                      |                      |                      |                      |                      |
| B     | Psychological Test                             |                      |                      |                      |                      |                      |
| C     | Audiometric Test                               |                      |                      |                      |                      |                      |
| D     | Respiratory Test                               |                      |                      |                      |                      |                      |
| 2     | Periodical Medical Examination (Mine Workers)  |                      |                      |                      |                      |                      |
| A     | Physical Check - up                            |                      |                      |                      |                      |                      |
| B     | Audiometric Test                               |                      |                      |                      |                      |                      |
| C     | Eye Check - up                                 |                      |                      |                      |                      |                      |
| D     | Respiratory Test                               |                      |                      |                      |                      |                      |
| 3     | Medical Camp (Mine Workers & Nearby Villagers) |                      |                      |                      |                      |                      |
| 4     | Training (Mine Workers)                        |                      |                      |                      |                      |                      |

### 10.9.2 Proposed Occupational Health and Safety Measures –

- The mine site will have adequate drinking water supply so that workers do not get dehydrated.
- Lightweight and loose-fitting clothes having light colours will be preferred to wear.
- Noise exposure measurements will be taken to determine the need for noise control strategies.
- The personal protective equipment will be provided for mine workers.
- At noisy working activity, exposure time will be minimized.
- Dust generating sources will be identified and proper control measure will be adopted.
- Periodic medical examinations will be provided for all workers.
- In respect of contract work, safety code for contractors and workers will be implemented. They will be allowed to work under strict supervision of statutory person/officials only after they will impart training at vocational training centres. All personal protective equipment's will be provided to them.
- A safety committee meeting every month will be organized to discuss the safety of the mines and the persons employed.
- Celebration of annual mines safety week and environmental week in order to develop safety awareness and harmony amongst employees and co quarry owners.

**FIGURE 10.1.: PERSONAL PROTECTIVE EQUIPMENT TO THE MINE WORKERS**



### 10.9.3: Health and Safety Training Programme

The Proponent will provide special induction program along with machinery manufacturers for the operators and co-operators to run and maintain the machinery effectively and efficiently. The training program for the supervisors and office staffs will be arranged in the Group Vocational Training Centres in the State and engage

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Environmental Consultants to provide periodical training to all the employees to carry out the mining operation in and eco-friendly manner as per Metalliferous Mines Regulation, 1961.

**10.9.4.: Budgetary Provision for Environmental Management –**

Adequate budgetary provision has been made by the Company for execution of Environmental Management Plan. The Table 10.10 gives overall investment on the environmental safeguards and recurring expenditure for successful monitoring and implementation of control measures.

**TABLE 10.10: EMP BUDGET FOR PROPOSED PROJECT**

| Activities               | Mitigation Measure   | Provision for Implementation  | Capital | Recurring |
|--------------------------|--|---|---------|-----------|
| <b>Air Environment</b>   | Compaction, gradation and drainage on both sides for Haulage Road  | Rental Dozer & drainage construction on haul road @ Rs. 10,000/- per hectare; and yearly maintenance @ Rs. 10,000/- per hectare | 28400   | 28400     |
|                          | 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     |
|                          | 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 - 4 Units       | 100000  | 10000     |
|                          | No overloading of trucks/tippers/tractors  | Manual Monitoring through Security guard  | 0       | 5000      |
|                          | Stone carrying trucks will be covered by tarpaulin   | 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 - 2 Units   | 15000   | 750       |
|                          | Regular monitoring of exhaust fumes as per RTO norms   | Monitoring of Exhaust Fumes by Manual Labour  | 0       | 5000      |
|                          | Regular sweeping and maintenance of approach roads for at least about 200 m from ML Area   | Provision for 2 labours @ Rs.10,000/labour (Contractual) per Hectare  | 0       | 56800     |
|                          | Installing wheel wash system near gate of quarry   | Installation + Maintenance + Supervision  | 50000   | 20000     |
| <b>Noise Environment</b> | Source of noise will be during operation of transportation vehicles, 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 implements that are required will be kept adequately near blasting site at the time of charging.   | Provision made in OHS part  | 0      | 0      |
|                         | Line Drilling all along the boundary to reduce the PPV from blasting activity and implementing controlled blasting.   | Provision made in Operating Cost  | 0      | 0      |
|                         | Proper warning system before blasting will be adopted and clearance of the area before blasting will be ensured.  | Blowing Whistle by Mining Mate / Blaster / Competent Person   | 0      | 0      |
|                         | Provision for Portable blaster shed   | Installation of Portable blasting shelter   | 50000  | 2000   |
|                         | NONEL Blasting will be practiced to control Ground vibration and fly rocks  | Rs. 30/- per 6 Tonnes of Blasted Material   | 0      | 189358 |
| <b>Waste Management</b> | Waste management (Spent Oil, Grease etc.,)  | Provision for domestic waste collection and disposal through authorized agency  | 5000   | 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>Mine Closure</b>     | 1. Progressive Closure Activity - Surface Runoff management   | Provision for garland drain @ Rs. 10,000/- per Hectare with maintenance of Rs. 5,000/- per annum  | 28400  | 5000   |
|                         | 2. Progressive Closure Activity 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   | 568000 | 10000  |
|                         | 3. Progressive Closure Activity Green belt development - 500 trees per one hectare - Proposal for 1150 Trees - (800 Inside Lease Area & 350 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) | 160000 | 24000  |

|   |  |   |         |       |
|---|--|---|---------|-------|
|   |  | Avenue Plantation @ 300 per plant (capital) for plantation outside the lease area and @ 30 per plant maintenance (recurring)  | 105000  | 10500 |
|   | 4. Implementation of Final Mine Closure Activity as per Approved Mining Plan on Last Year          | Few activities already covered as progressive closure activities as greenbelt development, wire fencing, garland drain.<br>*For Final Closure Activities 15% of the proposed closure cost will be spent during the final mine closure stage - Last Year | 87750   | 0     |
|   | 5. Contribution towards Green Fund. As per TNMMCR 1959, Rule 35 A                                  | The Contribution towards Green Funds @ 10% of Seigniorage fee are indicated as part of EMP Budge and not necessarily implemented in the Project Site  | 1310940 | 0     |
| <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 mentioning Environmental Conditions   | 10000   | 1000  |
|   | Air, Water, Noise and Soil Quality Sampling every 6 Months for Compliance Report of EC Conditions  | Submission of 2 Half Yearly Compliance - Lab Monitoring Report as per CPCB norms  | 0       | 50000 |
|   | Workers will be provided with Personal Protective Equipment's                                      | Provision of PPE @ Rs. 4000/- per employee with recurring based on wear and tear (say, @ Rs. 1000/- per employee) - 27 Employees  | 108000  | 27000 |
|   | Health check-up for workers will be provisioned  | IME & PME Health check-up @ Rs. 1000/- per employee   | 0       | 27000 |
|   | First aid facility will be provided  | Provision of 2 Kits per Hectare @ Rs. 2000/-  | 0       | 5680  |
|   | Slope stability action plan  | Slope stability action plan in the end of fourth year plan period   | 200000  | 0     |

|              |  |  |                |                |
|--------------|--|--|----------------|----------------|
|              | Mine will have safety precaution signages, boards.   | Provision for signages and boards made   | 10000          | 2000           |
|              | 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  | 142000         | 10000          |
|              | 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>CER</b>   | As per MoEF&CC OM 22-65/2017-IA.III Dated 25.02.2021   | Detailed Description in following slides and Budget allocation is included as per MoeEF&CC OM  | 500000         | 0              |
| <b>TOTAL</b> |  |  | <b>2914800</b> | <b>1361488</b> |

\*Marked cost is already discussed in the mining plan hence that is not included in the total Environmental Management plan cost Total Cost for the five years. The EMP has been prepared for the entire **lease period of 10 years** for the peak production capacity of **16,820m<sup>3</sup> of Rough stone**.



| <b>Year Wise Break Up</b>  |                      |
|----------------------------|----------------------|
| <b>1<sup>st</sup> Year</b> | <b>₹ 42,76,288/-</b> |
| 2 <sup>nd</sup> Year       | ₹ 14,29,562/-        |
| 3 <sup>rd</sup> Year       | ₹ 15,01,041/-        |
| 4 <sup>th</sup> Year       | ₹ 15,76,093/-        |
| 5 <sup>th</sup> Year       | ₹ 16,54,897/-        |
| <b>6<sup>th</sup> Year</b> | <b>₹ 31,95,042/-</b> |
| 7 <sup>th</sup> Year       | ₹ 18,97,394/-        |
| 8 <sup>th</sup> Year       | ₹ 19,92,264/-        |
| 9 <sup>th</sup> Year       | ₹ 20,91,877/-        |
| 10 <sup>th</sup> Year      | ₹ 22,84,221/-        |
| <b>Total</b>               | <b>219 Lakhs</b>     |

Cost inflation 5% per annum

Note: This Environmental Management plan cost will vary according to the public consultation comments

#### **10.10.: CONCLUSION –**

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

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## 11. SUMMARY AND CONCLUSION

This EIA & EMP report prepared for the proposed Rough Stone and Gravel Quarry project located in S.F.Nos. 151(P) & 152/4 of Kurumbalayam Village, Sathiyamangalam Taluk, Erode District belongs to Thiru.N.T. Saisada. the Project falls in the Cluster category consist of 4 Proposed & 1 Existing Quarries falls under “B” category as per MoEF & CC Notification S.O. 3977 (E).

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

The proposed project is categorized under category “B1” Activity 1(a) (mining lease area in cluster situation) and will be considered at SEIAA – TN after conducting Public Hearing and Submission of EIA/EMP Report for Grant of Environmental Clearance. “Draft EIA report prepared on the basis of ToR issued for carrying out public hearing for the grant of Environmental Clearance from SEIAA, Tamil Nadu”.

Environmental monitoring and audit mechanism have been recommended before and after commencement of the project, where necessary, to verify the accuracy of the EIA predictions and the effectiveness of recommended mitigation measures.

The main scope of the EIA study is to quantify the cumulative impact in the study area due to cluster quarries and formulate the effective mitigation measures for each individual leases. 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, Dust generation etc., have been discussed in this report. The baseline monitoring study has been carried out during the months March – May 2024 for various environmental components so as to assess the anticipated impacts of the cluster quarry projects on the environment and suitable mitigation measures for likely adverse impacts due to the proposed project is suggested individually for the respective proposed project under Chapter 10.

The project proponent ensures to obtain necessary clearances and quarrying will be carried out as per rules and regulations. The Mining Activity will be carried out in a phased manner as per the approved mining plan after obtaining EC, CTO from TNPCB, execution of lease deed and obtaining DGMS Permission and working will be carried out under the supervision of Competent Persons employed. Overall, the EIA report has predicted that the project will comply with all environment standards and legislation after commencement of the project and operational stage mitigation measures are implemented.

Mining operations has positive impact on environment and socio economy such as landscape improvement, water as by-product, economy development and better public services, providing and supply of Rough Stone as per market demand. Sustainable and modern mining leads us to see positive impact of mining operation and providing consistent employment for nearly 27 people directly in the proposed projects and indirectly around 50 people.

As discussed, it is safe to say that the proposed quarries are not likely to cause any significant impact to the ecology of the area, as adequate preventive measures will be adopted to keep the various pollutants within the permissible limits. Green belt development around the area will also be taken up as an effective pollution mitigate technique, as well as to serve as biological indicators for the pollutants released from the Kurumbalayam Rough Stone and Gravel Cluster Quarry (Extent 2.28.40 ha).

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## 12. DISCLOSURE OF CONSULTANT

M/s Geo Exploration and Mining Solutions, an Accredited Organization under Quality Council of India – National Accreditation Board for Education & Training, New Delhi, for carrying out the EIA Study as per the ToR Issued for the proposed project.

Name and address of the consultancy:

### GEO EXPLORATION AND MINING SOLUTIONS

No 17, Advaita Ashram Road,

Alagapuram, Salem – 636 004

Tamil Nadu, India

Email: [infogeoexploration@gmail.com](mailto:infogeoexploration@gmail.com)

Web: [www.gemssalem.com](http://www.gemssalem.com)

Phone: 0427 2431989.

The Accredited Experts and associated members who were engaged for this EIA study as given below –

| Sl.No. | Name of the expert     | In house/ Empanelled | EIA Coordinator |          | FAE             |             |
|--------|------------------------|----------------------|-----------------|----------|-----------------|-------------|
|        |                        |                      | Sector          | Category | Sector          | Category    |
| 1      | Dr. M. Ifthikhar Ahmed | In-house             | 1<br>38         | A<br>B   | WP<br>GEO<br>SC | B<br>A<br>A |
| 2      | Mr. A. Allimuthu       | In-house             | -               | -        | LU              | B           |
| 3      | Mr. A. Jagannathan     | In-house             | -               | -        | AP<br>SHW<br>NV | B<br>B<br>A |
| 4      | Mr. N. Senthilkumar    | Empanelled           | 38<br>28        | B<br>B   | AQ<br>WP<br>RH  | B<br>B<br>A |
| 5      | Mr.P.Panneer Selvam    | In-house             |                 |          | EB              | B           |
| 6      | Mrs.Sasikala.T         | In-house             | -               | -        | SE              | B           |
| 7      | Mr.Jayaraj.L           | In-house             | -               | -        | HG              | B           |
| 8      | Mr. Santhosh kumar.M   | In-house             | -               | -        | GEO             | B           |

| Abbreviations |  |     |  |
|---------------|--|-----|--|
| EC            | EIA Coordinator                                    | EB  | Ecology and bio-diversity                      |
| AEC           | Associate EIA Coordinator                          | NV  | Noise and vibration                            |
| FAE           | Functional Area Expert                             | SE  | Socio economics                                |
| FAA           | Functional Area Associates                         | HG  | Hydrology, ground water and water conservation |
| TM            | Team Member  | SC  | Soil conservation                              |
| GEO           | Geology  | RH  | Risk assessment and hazard management          |
| WP            | Water pollution monitoring, prevention and control | SHW | Solid and hazardous wastes                     |
| AP            | Air pollution monitoring, prevention and control   | MSW | Municipal Solid Wastes                         |
| LU            | Land Use   | ISW | Industrial Solid Wastes                        |
| AQ            | Meteorology, air quality modeling, and prediction  | HW  | Hazardous Wastes                               |

## DECLARATION BY EXPERTS CONTRIBUTING TO THE EIA/EMP

This EIA/EMP for Thiru N.T.Saisada Rough Stone & Gravel Quarry Project over an Extent of 2.28.40ha in Kurumbapalayam Village, Sathiyamangalam Taluk, Erode District of Tamil Nadu is prepared as per the Generic Structure of EIA Guidelines manual. It is also certified that information furnished in the above EIA study are true and correct to the best of our knowledge.

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

Name: **Dr. M. Ifthikhar Ahmed**

Designation: **EIA Coordinator**

Date & Signature:




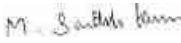










Period of Involvement: **Jan 2024 to till date**

**Associated Team Member with EIA Coordinator:**



1. Mr. R.Sakthivel
2. Mr.M.Shaik Nawas

### FUNCTIONAL AREA EXPERTS ENGAGED IN THE PROJECT

| Sl. No | Functional Area | Involvement   | Name of the Expert/s   | Signature   |
|--------|-----------------|---|------------------------|---|
| 1      | AP              | <ul style="list-style-type: none"> <li>▪ Identification of different sources of air pollution due to the proposed mine activity</li> <li>▪ Prediction of air pollution and propose mitigation measures / control measures</li> </ul>  | Mr. A. Jagannathan     |  |
| 2      | WP              | <ul style="list-style-type: none"> <li>▪ Suggesting water treatment systems, drainage facilities</li> <li>▪ Evaluating probable impacts of effluent/waste water discharges into the receiving environment/water bodies and suggesting control measures.</li> </ul>          | Dr. M. Ifthikhar Ahmed |  |
| 3      | HG              | <ul style="list-style-type: none"> <li>▪ Interpretation of ground water table and predict impact and propose mitigation measures.</li> <li>▪ Analysis and description of aquifer Characteristics</li> </ul>   | Mr. Jayaraj.L          |  |
| 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> | Mr.M.Santhosh kumar    |  |
| 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>   | Mrs. Sasikala.T        |  |

|    |     |  |                       |  |
|----|-----|--|-----------------------|--|
| 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> | Mr.Panneer Selvam     |   |
| 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>                                     | Mr. N. Senthilkumar   |   |
| 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>   | Mr. A. Allimuthu      |   |
| 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>  | Mr. A. Jagannathan    |   |
| 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>  | Mr. N. Senthilkumar   |   |
| 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. M. Iftikhar Ahmed |   |
| 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>   | Mr. A. Jagannathan    |  |

**LIST OF TEAM MEMBERS ENGAGED IN THIS PROJECT**

| Sl.No. | Name              | Functional Area | Involvement   | Signature   |
|--------|-------------------|-----------------|---|---|
| 1      | Mr. R.Sakthivel   | LU              | <ul style="list-style-type: none"> <li>Site Visit with FAE</li> <li>Assisting FAE in preparation of land use maps</li> <li>Provide inputs &amp; Assisting FAE with soil conservation methods and identifying impacts</li> </ul>     |  |
| 2      | Mr. Shaik Nawas.M | NV              | <ul style="list-style-type: none"> <li>Site Visit with FAE</li> <li>Assist FAE and provide inputs on impacts due to proposed mine activity and suggest mitigation measures</li> <li>Assist FAE with prediction modelling</li> </ul> |  |

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

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I, Dr. M. Ifthikhar Ahmed, Managing Partner, Geo Exploration and Mining Solutions, hereby, confirm that the above-mentioned Functional Area Experts and Team Members prepared the Cluster EIA/EMP for Rough Stone & Gravel Quarry Project over an Extent of 2.28.40ha in Kurumbapalayam Village, Sathiyamangalam Taluk, Erode District of Tamil Nadu. It is also certified that information furnished in the EIA study are true and correct to the best of our knowledge.

Signature& Date:



Name:

**Dr. M. Ifthikhar Ahmed**

Designation:

**Managing Partner**

Name of the EIA Consultant Organization:

**M/s. Geo Exploration and Mining Solutions**

NABET Certificate No & Issue Date:

**NABET/EIA/2225/RA 0276 Dated: 20-2-2023**

Validity:

**Valid till 06.08.2025**

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# **ANNEXURE**

## **THIRU. N.T. SAISADA ROUGH STONE AND GRAVEL QUARRY**

**S.F. No: 151(P) & 152/4**

Kurumbapalayam Village,  
Sathiyamangalam Taluk,  
Erode District

**EXTENT = 2.28.40Ha**

ToR obtained

File No.: 10788 ToR Identification No.: T024B0108TN5906337N Dated: 31.05.2024

### **Project Proponent**

**Thiru. N.T. Saisada**

S/o. Thyagaraj,

No. 12, Gandhiji 3rd Street,  
Karur Bypass, Erode District,  
Tamil Nadu State– 638 002

## LIST OF ANNEXURES

| <b>Annexures</b>                      | <b>DESCRIPTION</b>                           | <b>PAGE NOS</b> |
|---------------------------------------|--|-----------------|
| <b>P1-<br/>THIRU.N.T.<br/>SAISADA</b> | COPY OF TERMS OF REFERENCE                   | 1A - 14A        |
|                                       | COPY OF 500M RADIUS QUARRIES DETAILS LETTER  | 15A - 16A       |
|                                       | COPY OF MINING PLAN APPROVED LETTER          | 17A - 18A       |
|                                       | COPY OF APPROVED MINING PLAN WITH PLATES     | 19A – 85A       |
|                                       | COPY OF HYDROGEOLOGICAL REPORT               | 86A - 96A       |
|                                       | COPY OF INSPECTION REPORT                    | 97A – 114A      |
|                                       | COPY OF DFO LETTER                           | 115A – 116A     |
|                                       | COPY 300m AND VAO ATTESTATION LETTER         | 117A – 118A     |
| <b>P2-<br/>THIRU. C.RAJA</b>          | COPY OF ENVIRONMENTAL CLEARANCE              | 119A - 154A     |
| <b>E-1<br/>THIRU.N.T.<br/>SAISADA</b> | COPY OF ENVIRONMENTAL CLEARANCE              | 155A – 170A     |
|                                       | COPY OF BASE LINE MONITORING DATA            | 171A – 212A     |
|                                       | COPY OF CONSULTANT ACCREDITATION CERTIFICATE | 213A            |





सत्यमेव जयते

**File No: 10788**  
**Government of India**  
**Ministry of Environment, Forest and Climate Change**  
**(Issued by the State Environment Impact Assessment**  
**Authority(SEIAA), TAMIL NADU)**

\*\*\*



Dated 31/05/2024



To,

Saisada NT  
N T SAISADA RSG QUARRY  
Gandhiji third Street, Karuru Bypass road, Erode, ERODE, TAMIL NADU, , 638002  
ntsaisada@gmail.com

**Subject:** Grant of Terms of Reference with public hearing under the provision of the EIA Notification 2006-regarding.

**Sir/Madam,**

This is in reference to your application for Grant of Terms of Reference with public hearing under the provision of the EIA Notification 2006-regarding in respect of project N.T. Saisada, Rough stone and Gravel Quarry Project over an Extent of 2.28.40Ha of Patta lands in S.F.Nos. 151 (Part) and 152/4 of Kurumbapalayam Village, Sathyamangalam Taluk, Erode District, Tamil Nadu State submitted to Ministry vide proposal number SIA/TN/MIN/467395/2024 dated 02/05/2024.

**Ref:** 1. Online proposal No. SIA/TN/MIN/467395/2024, dt:27/03/2024.  
2. Your application submitted for Terms of Reference dated: 01.04.2024.

2. The particulars of the proposal are as below :

|  |  |
|--|--|
| (i) TOR Identification No.                 | TO24B0108TN5906337N  |
| (ii) File No.                              | 10788  |
| (iii) Clearance Type                       | TOR  |
| (iv) Category                              | B1   |
| (v) Project/Activity Included Schedule No. | 1(a) Mining of minerals<br>N.T. Saisada, Rough stone and Gravel Quarry<br>Project over an Extent of 2.28.40Ha of Patta lands |
| (vii) Name of Project                      | in S.F.Nos. 151 (Part) and 152/4 of<br>Kurumbapalayam Village, Sathyamangalam Taluk,<br>Erode District, Tamil Nadu State     |
| (viii) Name of Company/Organization        | N T SAISADA RSG QUARRY   |
| (ix) Location of Project (District, State) | ERODE, TAMIL NADU  |
| (x) Issuing Authority                      | SEIAA  |

|  |     |
|--|-----|
| <b>(xii) Applicability of General Conditions</b>   | yes |
| <b>(xiii) Applicability of Specific Conditions</b> | yes |

3. In view of the particulars given in the Para 1 above, the project proposal interalia including Form-1(Part A and B) were submitted to the SEIAA for an appraisal by the State Environment Impact Assessment Authority(SEIAA) under the provision of EIA notification 2006 and its subsequent amendments.
4. The above-mentioned proposal has been considered by State Environment Impact Assessment Authority(SEIAA) in the meeting held on 24/05/2024. 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.
5. The State Expert Appraisal Committee (SEAC), based on the information & clarifications provided by the project proponent and after detailed deliberations recommended the proposal for grant of Terms of Reference 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).
6. 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 grant Terms of Reference for instant proposal of **Thiru. N.T. Saisada** under the provisions of EIA Notification, 2006 and as amended thereof.
7. The Ministry/SEIAA-TN reserves the right to stipulate additional conditions, if found necessary.
8. The Terms of Reference 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.
9. This issues with the approval of the Competent Authority.
10. The TORs with public hearing prescribed shall be valid for a period of three years from the date of issue, for submission of the EIA/EMP report as per OMNo.J-11013/41/2006-IA-II(I)(part) dated 29th August, 2017.

#### **Copy To**

1. The Additional Chief Secretary to Government, Environment, Climate Change and Forests Department, Govt. of Tamil Nadu, Fort St. George, Chennai - 9.
2. The Chairman, Central Pollution Control Board, Parivesh Bhavan, CBD Cum-Office Complex, East Arjun Nagar, New Delhi - 110 032.
3. The Chair Person, Tamil Nadu Pollution Control Board, 76, Mount Salai, Guindy, Chennai - 600 032.
4. The APCCF (C), Regional Office, MoEF & CC (SZ), 34, HEPC Building, 1<sup>st</sup> & 2<sup>nd</sup> Floor, Cathedral Garden Road, Nungambakkam, Chennai - 34.
5. Monitoring Cell, IA Division, Ministry of Environment, Forests & CC, Paryavaran Bhavan, CGO Complex, New Delhi - 110 003.
6. The District Collector, Erode District.
7. Stock File.

**Annexure 1**

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

##### **1. Seiaa Specific Conditions:**

| S. No | Terms of Reference   |
|-------|--|
| 1.1   | <p>1) The PP shall carry out the scientific studies to design the controlled blast parameters for reducing the blast-induced ground/air- vibrations and eliminating the fly rock from the blasting operations carried out in the quarry, by involving anyone of these reputed Research and Academic Institution such as CSIR-Central Institute of Mining &amp; Fuel Research / Dhanbad, NIRM/Bangalore, IIT-Madras, NIT-Dept of Mining Engg, Surathkal, and Anna University Chennai-CEG Campus. A copy of such scientific study report shall be submitted to the SEIAA along with EIA report.</p> <p>2) The PP shall annually carry out the scientific studies to assess the hydrogeological condition of the quarry for ensuring the safety of the persons working in the mine and to determine impacts of the mining operation on the ground water conditions in the waterbodies, by involving any one of the reputed Research and Academic Institution - CSIR-Central Institute of Mining &amp; Fuel Research / Dhanbad, NIRM/Bangalore, Division of Geotechnical Engineering-IIT-Madras, NIT-Dept of Mining Engg, Surathkal, University of Madras – Centre for Environmental Studies, and Anna University Chennai-Dept of Geology, CEG Campus. A copy of such scientific study report shall be submitted to the SEIAA along with EIA report.</p> <p>3) For the safety of the persons employed in the quarry, the PP shall carry out the scientific studies to assess the slope stability of the working benches 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. A copy of such scientific study report shall be submitted to the SEIAA along with EIA report.</p> <p>4) The Terms of Reference (ToR) with Public Hearing is granted based on studies, assessments and records to be produced as sought by the SEAC and SEIAA, for undertaking the Environment Impact Assessment Study and preparation of Environment Management Plan for the quantity of 145660 m<sup>3</sup> of Rough stone and 15582 m<sup>3</sup> of Gravel upto the depth of 41m BGL and the annual peak production of 16820m<sup>3</sup> of Rough stone and 5270 m<sup>3</sup> of Gravel as per the approved mining plan</p> |

## 2. Seac Conditions - Site Specific

| S. No | Terms of Reference  |
|-------|---|
| 2.1   | <p><b>1. The PP shall conduct specific study on the safety aspects and implications of stone quarrying activity on the stability of the dam structure. The study shall be conducted by the Dam Safety Division of Water Resources Department of Tamil Nadu and the study report shall spell out the buffer zone within which (a) any stone quarrying activity involving drilling and blasting should not permitted and also recommend an extended buffer zone within which such activities can be allowed subject to special conditions which should be spelt out.</b></p> <p>2. For the existing quarry, the PP shall obtain a letter from the concerned AD (Mines) which shall also stipulate the following information:</p> <ol style="list-style-type: none"> <li>i. Original pit dimension of the existing quarry</li> <li><b>ii. Quantity achieved Vs EC Approved Quantity</b></li> <li>iii. Balance Quantity as per Mineable Reserve calculated.</li> <li>iv. Month wise Production details</li> <li>v. Mined out Depth as on date Vs EC Permitted depth</li> <li>vi. Details of illegal/illicit mining carried out, if any</li> <li>vii. Non-compliance/Violation in the quarry during the past working.</li> <li>viii. Quantity of material mined out outside the mine lease area (or) in the adjacent quarry/land.</li> <li>ix. Existing condition of Safety zone/benches</li> <li>x. Details of any penalties levied on the PP for any violation in the quarry operation by the Department of Geology and Mining.</li> </ol> |

| S. No | Terms of Reference   |
|-------|--|
|       | <p>3. The PP shall furnish the consent agreement from the landowner registered with the concerned authority during the EIA appraisal.</p> <p>4. The PP shall complete the fencing, tree plantation and photographs, videos of the same shall be furnished.</p> <p>5. The PP shall mark the DGPS reference pillars painted with blue &amp; white colour indicating the safety barrier of 7.5 m to be left under the Rule 13 (1) of MCDR, 1988 within the lease boundary and protective bunds, and provide the details during the EIA appraisal.</p> <p>6. The Proponent shall complete the garland drainage around the boundary of the proposed quarry and the photographs indicating the same shall be shown during the EIA appraisal.</p> <p>7. The PP shall submit a detailed hydrological report indicating the impact of proposed quarrying operations on the waterbodies like lake, water tanks, etc located within 1 km of the proposed quarry.</p> <p>8. The Proponent shall justify the selection of the site for carrying out the stone quarrying with the total volume arrived for the excavation &amp; production adequate details such as lithology of the deposit, reserve estimation, place for waste dump/mined mineral storage, end-use of mined materials, identified potential customers/end-users and travel path.</p> <p>9. 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 with details such as dwelling houses with number of occupants, whether it belongs to the owner (or) not, places of worship, Schools/Colleges 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>10. The proponent shall furnish photographs and video showing the 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>11. During the EIA appraisal, the PP shall furnish the affidavit stating that he will not employ any external agency for carrying out the blasting operation in the proposed quarry and he shall also install the temporary (or) permanent magazine approved by the concerned licensing authority <b>before the execution of the lease</b>, for storing the authorized explosives &amp; detonators separately in accordance with the Explosive Rules, 2008.</p> <p>12. During the EIA appraisal, the PP shall furnish the affidavit stating that he will appoint a First Class/Second Class Mine Manager for managing the quarrying operations before obtaining the CTO from the TNPCB. Further, the PP will also send the 'Notice of Opening' indicating the appointment of such Statutory officials and the proposed usage of HEMM shall be sent to the Director of Mines Safety, Chennai Region of the Mine under the provisions of MMR 1961 atleast 30 days before the commencement of the mining operation after the execution of lease, if the EC is granted.</p> <p>13. <b>Since the structures including the houses are situated within a radial distance of 500 m</b>, the PP shall carry out the scientific studies <b>to design the controlled blast parameters</b> for reducing the cumulative blast-induced ground/air- vibrations and eliminating the fly rock from the blasting operations carried out in the cluster of quarries located in the region, and <b>subsequently with proper validation of the design through trial blasts</b> in any of the existing &amp; operating quarries to monitor the PPV produced from the blasting in the village (500m) and near the Temples (230 &amp; 300 m), after obtaining the prior permission from the DMS / Chennai Region in accordance with DGMS Circular No. 7 of 1997, by involving anyone of these reputed Research and Academic Institution such as CSIR-Central Institute of Mining &amp; Fuel Research / Dhanbad, NIRM/Bangalore, IIT (ISM)/Dhanbad, IIT-Madras, NIT-Dept of Mining Engg, Surathkal, and Anna University Chennai-CEG Campus. Further the report shall also include the <b>actual data on the air dust particles produced at the time of blasting</b>. A copy of such scientific study report shall be submitted to the SEIAA, MoEF as a part of EIA study during the appraisal and to the DMS/DGMS-Chennai Region while submitting the Notice of Opening, without any deviation.</p> <p>14. Since the quarrying operations are proposed in an existing pit possessing the quarry wall of 25 to 27 m depth without adequate benches in accordance with the provisions of MMR, 1961, the PP shall carry out the scientific studies to assess the slope stability of the working benches and existing quarry wall for spelling out the stabilization measures to ensure the safety of the persons to be</p> |

| S. No | Terms of Reference  |
|-------|---|
|       | <p>employed in the proposed quarry, by involving any one of the reputed Research and Academic Institutions - CSIR-Central Institute of Mining &amp; Fuel Research / Dhanbad, NIRM/Bangalore, IIT (ISM)/Dhanbad, Division of Geotechnical Engineering-IIT-Madras, NIT-Dept of Mining Engg, Surathkal, and Anna University Chennai-CEG Campus. A copy of such scientific study report shall be submitted to the SEIAA, MoEF as a part of EIA study during the appraisal and to the DMS/DGMS-Chennai Region while submitting the Notice of Opening, without any deviation.</p> <p>15. The PP shall prepare the Standard Operating Procedures (SoP) for carrying out the 'Best Mining Practices' in the areas of drilling, blasting excavation, transportation and green belt development and provide the same during the EIA appraisal.</p> <p>16. 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> |

### 3. Seac Standard Conditions

| S. No | Terms of Reference  |
|-------|---|
| 3.1   | <ol style="list-style-type: none"> <li>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: <ol 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> </ol> </li> <li>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.</li> <li>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.</li> <li>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.</li> <li>5. The Proponent shall carry out Bio diversity study through reputed Institution and the same shall be included in EIA Report.</li> <li>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.</li> <li>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.</li> </ol> |

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

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

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

#### 4. Seiaa Standard Conditions:

| S. No | Terms of Reference   |
|-------|--|
| 4.1   | <ol style="list-style-type: none"> <li>1. Impacts on Energy requirement.</li> <li>2. Impacts on living System (air ,water ,soil &amp; micro organism).</li> <li>3. Impacts on terrestrial &amp; aquatic within and surrounding areas.</li> <li>4. 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 furnish the detailed EMP mentioning all the CER activities as committed with the action plan.</li> <li>5. All the construction of Buildings shall be energy efficient and confirm to the green building norms.</li> <li>6. The proponent shall provide adequate parking facility for vehicles of all the workers &amp; visitors.</li> <li>7. The proponent shall ensure that no treated or untreated trade effluent/sewage discharged outside the premises under any circumstances.</li> <li>8. The disaster management and disaster mitigation standards to be seriously adhered to avoid of calamities.</li> <li>9. The proponent shall provide the action taken for reduction of green house gas emissions to support the climatic action to make it sustainable buildings.</li> <li>10. The project proponent shall furnish the action taken to provide adequate parking space for visitors of all inmates including clean traffic plan.</li> <li>11. The project proponent shall furnish the action taken to improve water usage efficiency in the building.</li> <li>12. The project proponent shall conduct detailed study of biodiversity flora &amp; fauna including invasives /endemic vulnerable species.</li> <li>13. The project proponent shall furnish NOC obtained from competent authority that there is no encroachment of water bodies (including canals).</li> <li>14. The project proponent shall furnish impact of Green House Gases emissions and climate change likely due to activities.</li> <li>15. The project proponent shall conduct detailed soil investigation including microflora /fauna.</li> <li>16. The project proponent shall study impact on livelihoods of locals.</li> <li>17. The project proponent shall furnish List of trees available in the area.</li> <li>18. The project proponent shall study impact of activities on water bodies/wetlands.</li> </ol> |



| S. No | Terms of Reference  |
|-------|---|
|       | 19. The project proponent shall conduct studies on invasive and alien species |

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

**1.**

| S. No | Terms of Reference   |
|-------|--|
| 1.1   | An EIA-EMP Report shall be prepared for peak capacity (.....MTPA)operation in an ML/project area of.....ha based on the generic structure specified in Appendix III of the EIA Notification, 2006.   |
| 1.2   | An EIA-EMP Report would be prepared for peak capacity operation to cover the impacts and environment management plan for the project specific activities on the environment of the region, and the environmental quality encompassing air, water, land, biotic community, etc. through collection of data and information, generation of data on impacts including prediction modeling for..... MTPA of mineral production based on approved project/Mining Plan for.....MTPA. Baseline data collection can be for any season (three months) except monsoon.   |
| 1.3   | Propoer KML file with pin drop and coordinate of mine at 500-1000 m interval be provided   |
| 1.4   | A Study area map of the core zone (project area) and 10 km area of the buffer zone (1: 50,000 scale) clearly delineating the major topographical features such as the land use, surface drainage pattern including rivers/streams/nullahs/canals, locations of human habitations, major constructions including railways, roads, pipelines, major industries, mines and other polluting sources. In case of ecologically sensitive areas such as Biosphere Reserves/National Parks/WL Sanctuaries/ Elephant Reserves, forests (Reserved/Protected), migratory corridors of fauna, and areas where endangered fauna and plants of medicinal and economic importance found in the 15 km study area should be given. The above details to be furnished in tabular form also |
| 1.5   | Map showing the core zone delineating the agricultural land (irrigated and un-irrigated, uncultivable land as defined in the revenue records, forest areas (as per records), along with other physical features such as water bodies, etc should be furnished.   |
| 1.6   | A contour map showing the area drainage of the core zone and 25 km of the study area (where the water courses of the core zone ultimately join the major rivers/streams outside the lease/project area) should also be clearly indicated in the separate map.  |
| 1.7   | Catchment area with its drainage map of 25 km area within and outside the mine shall be provided with names, details of rivers/ riverlet system and its respective order. The map should clearly indicate drainage pattern of the catchment area with basin of major rivers. Diversion of drains/ river need eloboration in form of lengthe, quantity and quality of water to be diverted  |
| 1.8   | (Details of mineral reserves, geological status of the study area and the seams to be worked, ultimate working depth and progressive stage-wise working scheme until the end of mine life should be provided on the basis of the approved rated capacity and calendar plans of production from the approved Mining Plan. Geological maps and sections should be included. The Progressive mine development and Conceptual Final Mine Closure Plan should also be shown in figures. Details of mine plan and mine closure plan approval of Competent Authority should be furnished for green field and expansion projects.  |

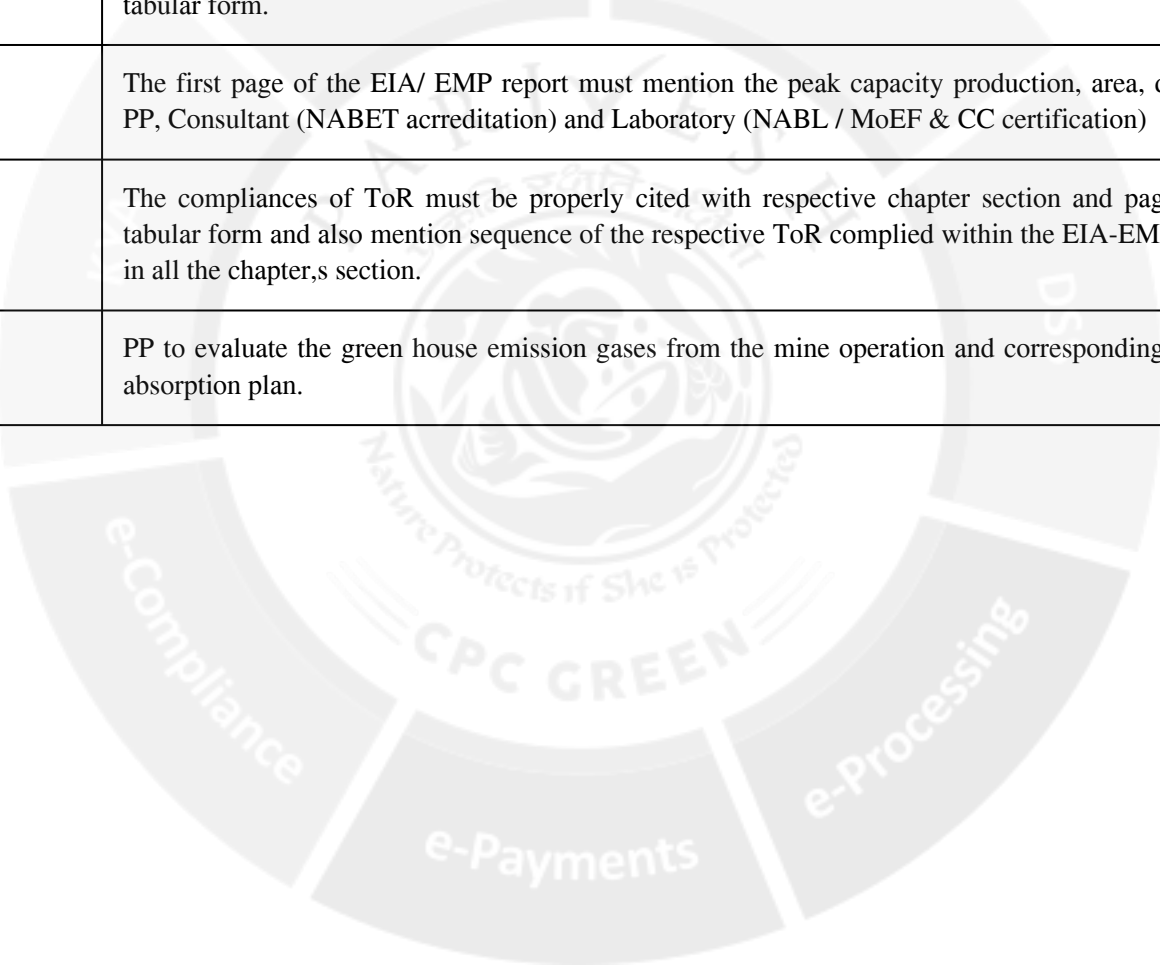
| S. No | Terms of Reference   |                               |                              |                               |                              |                      |   |                   |  |  |  |   |             |  |  |  |   |              |  |  |  |   |             |  |  |  |   |                  |  |  |  |      |         |           |   |           |  |   |                |  |   |       |  |   |                  |  |  |       |  |
|-------|--|-------------------------------|------------------------------|-------------------------------|------------------------------|----------------------|---|-------------------|--|--|--|---|-------------|--|--|--|---|--------------|--|--|--|---|-------------|--|--|--|---|------------------|--|--|--|------|---------|-----------|---|-----------|--|---|----------------|--|---|-------|--|---|------------------|--|--|-------|--|
| 1.9   | Details of mining methods, technology, equipment to be used, etc., rationale for selection of specified technology and equipment proposed to be used vis-à-vis the potential impacts should be provided.   |                               |                              |                               |                              |                      |   |                   |  |  |  |   |             |  |  |  |   |              |  |  |  |   |             |  |  |  |   |                  |  |  |  |      |         |           |   |           |  |   |                |  |   |       |  |   |                  |  |  |       |  |
| 1.10  | Impact of mining on hydrology, modification of natural drainage, diversion and channeling of the existing rivers/water courses flowing through the ML and adjoining the lease/project and the impact on the existing users and impacts of mining operations thereon.   |                               |                              |                               |                              |                      |   |                   |  |  |  |   |             |  |  |  |   |              |  |  |  |   |             |  |  |  |   |                  |  |  |  |      |         |           |   |           |  |   |                |  |   |       |  |   |                  |  |  |       |  |
| 1.11  | A detailed Site plan of the mine showing the proposed break-up of the land for mining operations such as the quarry area, OB dumps, green belt, safety zone, buildings, infrastructure, Stockyard, township/colony (within and adjacent to the ML), undisturbed area -if any, and landscape features such as existing roads, drains/natural water bodies to be left undisturbed along with any natural drainage adjoining the lease /project areas, and modification of thereof in terms of construction of embankments/bunds, proposed diversion/re-channelling of the water courses, etc., approach roads, major haul roads, etc should be indicated.  |                               |                              |                               |                              |                      |   |                   |  |  |  |   |             |  |  |  |   |              |  |  |  |   |             |  |  |  |   |                  |  |  |  |      |         |           |   |           |  |   |                |  |   |       |  |   |                  |  |  |       |  |
| 1.12  | <p>Original land use (agricultural land/forestland/grazing land/wasteland/water bodies) of the area should be provided as per the tables given below. Impacts of project, if any on the land use, in particular, agricultural land/forestland/grazing land/water bodies falling within the lease/project and acquired for mining operations should be analyzed. Extent of area under surface rights and under mining rights should be specified. Area under Surface Rights</p> <table border="1"> <thead> <tr> <th>S.N</th> <th>ML/Project Land use</th> <th>Area under Surface Rights(ha)</th> <th>Area Under Mining Rights(ha)</th> <th>Area under Both (ha)</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>Agricultural land</td> <td></td> <td></td> <td></td> </tr> <tr> <td>2</td> <td>Forest Land</td> <td></td> <td></td> <td></td> </tr> <tr> <td>3</td> <td>Grazing Land</td> <td></td> <td></td> <td></td> </tr> <tr> <td>4</td> <td>Settlements</td> <td></td> <td></td> <td></td> </tr> <tr> <td>5</td> <td>Others (specify)</td> <td></td> <td></td> <td></td> </tr> </tbody> </table><br><table border="1"> <thead> <tr> <th>S.N.</th> <th>Details</th> <th>Area (ha)</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>Buildings</td> <td></td> </tr> <tr> <td>2</td> <td>Infrastructure</td> <td></td> </tr> <tr> <td>3</td> <td>Roads</td> <td></td> </tr> <tr> <td>4</td> <td>Others (specify)</td> <td></td> </tr> <tr> <td></td> <td>Total</td> <td></td> </tr> </tbody> </table> | S.N                           | ML/Project Land use          | Area under Surface Rights(ha) | Area Under Mining Rights(ha) | Area under Both (ha) | 1 | Agricultural land |  |  |  | 2 | Forest Land |  |  |  | 3 | Grazing Land |  |  |  | 4 | Settlements |  |  |  | 5 | Others (specify) |  |  |  | S.N. | Details | Area (ha) | 1 | Buildings |  | 2 | Infrastructure |  | 3 | Roads |  | 4 | Others (specify) |  |  | Total |  |
| S.N   | ML/Project Land use  | Area under Surface Rights(ha) | Area Under Mining Rights(ha) | Area under Both (ha)          |                              |                      |   |                   |  |  |  |   |             |  |  |  |   |              |  |  |  |   |             |  |  |  |   |                  |  |  |  |      |         |           |   |           |  |   |                |  |   |       |  |   |                  |  |  |       |  |
| 1     | Agricultural land  |                               |                              |                               |                              |                      |   |                   |  |  |  |   |             |  |  |  |   |              |  |  |  |   |             |  |  |  |   |                  |  |  |  |      |         |           |   |           |  |   |                |  |   |       |  |   |                  |  |  |       |  |
| 2     | Forest Land  |                               |                              |                               |                              |                      |   |                   |  |  |  |   |             |  |  |  |   |              |  |  |  |   |             |  |  |  |   |                  |  |  |  |      |         |           |   |           |  |   |                |  |   |       |  |   |                  |  |  |       |  |
| 3     | Grazing Land   |                               |                              |                               |                              |                      |   |                   |  |  |  |   |             |  |  |  |   |              |  |  |  |   |             |  |  |  |   |                  |  |  |  |      |         |           |   |           |  |   |                |  |   |       |  |   |                  |  |  |       |  |
| 4     | Settlements  |                               |                              |                               |                              |                      |   |                   |  |  |  |   |             |  |  |  |   |              |  |  |  |   |             |  |  |  |   |                  |  |  |  |      |         |           |   |           |  |   |                |  |   |       |  |   |                  |  |  |       |  |
| 5     | Others (specify)   |                               |                              |                               |                              |                      |   |                   |  |  |  |   |             |  |  |  |   |              |  |  |  |   |             |  |  |  |   |                  |  |  |  |      |         |           |   |           |  |   |                |  |   |       |  |   |                  |  |  |       |  |
| S.N.  | Details  | Area (ha)                     |                              |                               |                              |                      |   |                   |  |  |  |   |             |  |  |  |   |              |  |  |  |   |             |  |  |  |   |                  |  |  |  |      |         |           |   |           |  |   |                |  |   |       |  |   |                  |  |  |       |  |
| 1     | Buildings  |                               |                              |                               |                              |                      |   |                   |  |  |  |   |             |  |  |  |   |              |  |  |  |   |             |  |  |  |   |                  |  |  |  |      |         |           |   |           |  |   |                |  |   |       |  |   |                  |  |  |       |  |
| 2     | Infrastructure   |                               |                              |                               |                              |                      |   |                   |  |  |  |   |             |  |  |  |   |              |  |  |  |   |             |  |  |  |   |                  |  |  |  |      |         |           |   |           |  |   |                |  |   |       |  |   |                  |  |  |       |  |
| 3     | Roads  |                               |                              |                               |                              |                      |   |                   |  |  |  |   |             |  |  |  |   |              |  |  |  |   |             |  |  |  |   |                  |  |  |  |      |         |           |   |           |  |   |                |  |   |       |  |   |                  |  |  |       |  |
| 4     | Others (specify)   |                               |                              |                               |                              |                      |   |                   |  |  |  |   |             |  |  |  |   |              |  |  |  |   |             |  |  |  |   |                  |  |  |  |      |         |           |   |           |  |   |                |  |   |       |  |   |                  |  |  |       |  |
|       | Total  |                               |                              |                               |                              |                      |   |                   |  |  |  |   |             |  |  |  |   |              |  |  |  |   |             |  |  |  |   |                  |  |  |  |      |         |           |   |           |  |   |                |  |   |       |  |   |                  |  |  |       |  |
| 1.13  | Study on the existing flora and fauna in the study area (10km) should be carried out by an institution of relevant discipline. The list of flora and fauna duly authenticated separately for the core and study area and a statement clearly specifying whether the study area forms a part of the migratory corridor of any endangered fauna should be given. If the study area has endangered flora and fauna, or if the area is occasionally visited or used as a habitat by Schedule-I species, or if the project falls within 15 km of an ecologically sensitive area, or used as a migratory corridor then a Comprehensive Conservation Plan along with the appropriate budgetary provision should be prepared and submitted with EIA-EMP Report; and comments/observation from the CWLW of the State Govt. should also be obtained and furnished.   |                               |                              |                               |                              |                      |   |                   |  |  |  |   |             |  |  |  |   |              |  |  |  |   |             |  |  |  |   |                  |  |  |  |      |         |           |   |           |  |   |                |  |   |       |  |   |                  |  |  |       |  |
| 1.14  | One-season (other than monsoon) primary baseline data on environmental quality - air (PM10,  |                               |                              |                               |                              |                      |   |                   |  |  |  |   |             |  |  |  |   |              |  |  |  |   |             |  |  |  |   |                  |  |  |  |      |         |           |   |           |  |   |                |  |   |       |  |   |                  |  |  |       |  |

| S. No | Terms of Reference  |
|-------|---|
|       | PM2.5, SO <sub>x</sub> , NO <sub>x</sub> and heavy metals such as Hg, Pb, Cr, As, etc), noise, water (surface and groundwater), soil - along with one-season met data coinciding with the same season for AAQ collection period should be provided. The detail of NABL/ MoEF&CC certification of the respective laboratory and NABET accreditation of the consultant to be provided.  |
| 1.15  | Map (1: 50, 000 scale) of the study area (core and buffer zone) showing the location of various sampling stations superimposed with location of habitats, other industries/mines, polluting sources, should be provided. The number and location of the sampling stations in both core and buffer zones should be selected on the basis of size of lease/project area, the proposed impacts in the downwind (air)/downstream (surface water)/groundwater regime (based on flow). One station should be in the upwind/upstream/non-impact/non-polluting area as a control station. The monitoring should be as per CPCB guidelines and parameters for water testing for both ground water and surface water as per ISI standards and CPCB classification wherever applicable. Observed values should be provided along with the specified standards. |
| 1.16  | For proper baseline air quality assessment, Wind rose pattern in the area should be reviewed and accordingly location of AAMSQ shall be planned by the collection of air quality data by adequate monitoring stations in the downwind areas. Monitoring location for collecting baseline data should cover overall the 10 km buffer zone i.e. dispersed in 10 km buffer area. In case of expansion, the displayed data of CAAQMS and its comparison with the monitoring data to be provided   |
| 1.17  | A detailed traffic study along with presence of habitation in 100 mts distance from both side of road, the impact on the air quality with its proper measures and plan of action with timeline for widening of road. The project will increase the no. of vehicle along the road which will indirectly contribute to carbon emission so what will be the compensatory action plan should be clearly spell out in EIA/ EMP report.   |
| 1.18  | The socio-economic study to conducted with actual survey report and a comparative assessment to be provided from the census data should be provided in EIA/ EMP report also occupational status & economic status of the study area and what economically project will contribute should be clearly mention. The study should also include the status of infrastructural facilities and amenities present in the study area and a comparative assessment with census data to be provided and to link it with the initialization and quantification of need based survey for CSR activities to be followed.  |
| 1.19  | The Ecology and biodiversity study should also indicate the likely impact of change in forest area for surface infrastructural development or mining activity in relation to the climate change of that area and what will be the compensatory measure to be adopted by PP to minimize the impact of forest diversion.  |
| 1.20  | Baseline data on the health of the population in the impact zone and measures for occupational health and safety of the personnel and manpower for the mine should be submitted.  |
| 1.21  | Impact of proposed project/activity on hydrological regime of the area shall be assessed and report be submitted. Hydrological studies as per GEC 2015 guidelines to be prepared and submitted  |
| 1.22  | Impact of mining and water abstraction from the mine on the hydrogeology and groundwater regime within the core zone and 10 km buffer zone including long-term monitoring measures should be provided. Details of rainwater harvesting and measures for recharge of groundwater should be reflected in case there is a declining trend of groundwater availability and/or if the area falls within dark/grey zone.  |

| S. No | Terms of Reference   |
|-------|--|
| 1.23  | Study on land subsidence including modeling for prediction, mitigation/prevention of subsidence, continuous monitoring measures, and safety issues should be carried out.  |
| 1.24  | Detailed water balance should be provided. The break up of water requirement as per different activities in the mining operations, including use of water for sand stowing should be given separately. Source of water for use in mine, sanction of the Competent Authority in the State Govt. and impacts vis-à-vis the competing users should be provided.   |
| 1.25  | PP shall submit design details of all Air Pollution control equipment (APCEs) to be implemented as part of Environment Management Plan vis-à-vis reduction in concentration of emission for each APCEs   |
| 1.26  | PP shall propose to use LNG/CNG based mining machineries and trucks for mining operation and transportation of mineral. The measures adopted to conserve energy or use of renewable sources shall be explored  |
| 1.27  | Site specific Impact assessment with its mitigation measures, Risk Assessment and Disaster Preparedness and Management Plan should be provided.  |
| 1.28  | Impact of choice of mining method, technology, selected use of machinery and impact on air quality, mineral transportation, handling & storage/stockyard, etc, Impact of blasting, noise and vibrations should be provided.  |
| 1.29  | Impacts of mineral transportation within the mining area and outside the lease/project along with flow-chart indicating the specific areas generating fugitive emissions should be provided. Impacts of transportation, handling, transfer of mineral and waste on air quality, generation of effluents from workshop etc, management plan for maintenance of HEMM and other machinery/equipment should be given. Details of various facilities such as rest areas and canteen for workers and effluents/pollution load emanating from these activities should also be provided. |
| 1.30  | Details of various facilities to be provided to the workers in terms of parking, rest areas and canteen, and effluents/pollution load resulting from these activities should also be given.  |
| 1.31  | The number and efficiency of mobile/static water jet, Fog cannon sprinkling system along the main mineral transportation road inside the mine, approach roads to the mine/stockyard/siding, and also the frequency of their use in impacting air quality should be provided.   |
| 1.32  | Conceptual Final Mine Closure Plan and post mining land use and restoration of land/habitat to the pre- mining status should be provided. A Plan for the ecological restoration of the mined out area and post mining land use should be prepared with detailed cost provisions. Impact and management of wastes and issues of re-handling (wherever applicable) and backfilling and progressive mine closure and reclamation should be furnished.   |
| 1.33  | Adequate greenbelt nearby areas, mineral stock yard and transportation area of mineral shall be provided with details of species selected and survival rate Greenbelt development should be undertaken particularly around the transport route.  |
| 1.34  | Cost of EMP (capital and recurring) should be included in the project cost and for progressive and final mine closure plan.  |

| S. No | Terms of Reference   |                    |                |                |                        |                     |                        |                |     |  |                     |  |       |                |                 |                     |      |  |      |           |  |  |          |      |  |  |  |                  |  |  |  |  |  |  |  |                    |  |  |  |  |  |  |  |         |  |  |  |  |  |
|-------|--|--------------------|----------------|----------------|------------------------|---------------------|------------------------|----------------|-----|--|---------------------|--|-------|----------------|-----------------|---------------------|------|--|------|-----------|--|--|----------|------|--|--|--|------------------|--|--|--|--|--|--|--|--------------------|--|--|--|--|--|--|--|---------|--|--|--|--|--|
| 1.35  | Details of R&R. Detailed project specific R&R Plan with data on the existing socio- economic status of the population (including tribals, SC/ST, BPL families) found in the study area and broad plan for resettlement of the displaced population, site for the resettlement colony, alternate livelihood concerns/employment for the displaced people, civic and housing amenities being offered, etc and costs along with the schedule of the implementation of the R&R Plan should be given.   |                    |                |                |                        |                     |                        |                |     |  |                     |  |       |                |                 |                     |      |  |      |           |  |  |          |      |  |  |  |                  |  |  |  |  |  |  |  |                    |  |  |  |  |  |  |  |         |  |  |  |  |  |
| 1.36  | CSR Plan along with details of villages and specific budgetary provisions (capital and recurring) for specific activities over the life of the project should be given.  |                    |                |                |                        |                     |                        |                |     |  |                     |  |       |                |                 |                     |      |  |      |           |  |  |          |      |  |  |  |                  |  |  |  |  |  |  |  |                    |  |  |  |  |  |  |  |         |  |  |  |  |  |
| 1.37  | Corporate Environment Responsibility:  |                    |                |                |                        |                     |                        |                |     |  |                     |  |       |                |                 |                     |      |  |      |           |  |  |          |      |  |  |  |                  |  |  |  |  |  |  |  |                    |  |  |  |  |  |  |  |         |  |  |  |  |  |
| 1.38  | a) The Company must have a well laid down Environment Policy approved by the Board of Directors.   |                    |                |                |                        |                     |                        |                |     |  |                     |  |       |                |                 |                     |      |  |      |           |  |  |          |      |  |  |  |                  |  |  |  |  |  |  |  |                    |  |  |  |  |  |  |  |         |  |  |  |  |  |
| 1.39  | b) The Environment Policy must prescribe for standard operating process/procedures to bring into focus any infringements/deviation/violation of the environmental or forest norms/conditions.  |                    |                |                |                        |                     |                        |                |     |  |                     |  |       |                |                 |                     |      |  |      |           |  |  |          |      |  |  |  |                  |  |  |  |  |  |  |  |                    |  |  |  |  |  |  |  |         |  |  |  |  |  |
| 1.40  | c) The hierarchical system or Administrative Order of the company to deal with environmental issues and for ensuring compliance with the environmental clearance conditions must be furnished.   |                    |                |                |                        |                     |                        |                |     |  |                     |  |       |                |                 |                     |      |  |      |           |  |  |          |      |  |  |  |                  |  |  |  |  |  |  |  |                    |  |  |  |  |  |  |  |         |  |  |  |  |  |
| 1.41  | d) To have proper checks and balances, the company should have a well laid down 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.  |                    |                |                |                        |                     |                        |                |     |  |                     |  |       |                |                 |                     |      |  |      |           |  |  |          |      |  |  |  |                  |  |  |  |  |  |  |  |                    |  |  |  |  |  |  |  |         |  |  |  |  |  |
| 1.42  | e) Environment Management Cell and its responsibilities to be clearly spelled out in EIA/ EMP report   |                    |                |                |                        |                     |                        |                |     |  |                     |  |       |                |                 |                     |      |  |      |           |  |  |          |      |  |  |  |                  |  |  |  |  |  |  |  |                    |  |  |  |  |  |  |  |         |  |  |  |  |  |
| 1.43  | f) In built mechanism of self-monitoring of compliance of environmental regulations should be indicated.   |                    |                |                |                        |                     |                        |                |     |  |                     |  |       |                |                 |                     |      |  |      |           |  |  |          |      |  |  |  |                  |  |  |  |  |  |  |  |                    |  |  |  |  |  |  |  |         |  |  |  |  |  |
| 1.44  | Status of any litigations/ court cases filed/pending on the project should be provided.  |                    |                |                |                        |                     |                        |                |     |  |                     |  |       |                |                 |                     |      |  |      |           |  |  |          |      |  |  |  |                  |  |  |  |  |  |  |  |                    |  |  |  |  |  |  |  |         |  |  |  |  |  |
| 1.45  | PP shall submit clarification from PCCF that mine does not falls under corridors of any National Park and Wildlife Sanctuary with certified map showing distance of nearest sanctuary.   |                    |                |                |                        |                     |                        |                |     |  |                     |  |       |                |                 |                     |      |  |      |           |  |  |          |      |  |  |  |                  |  |  |  |  |  |  |  |                    |  |  |  |  |  |  |  |         |  |  |  |  |  |
| 1.46  | Copy of clearances/approvals such as Forestry clearances, Mining Plan Approval, mine closer plan approval. NOC from Flood and Irrigation Dept. (if req.), etc. wherever applicable.  |                    |                |                |                        |                     |                        |                |     |  |                     |  |       |                |                 |                     |      |  |      |           |  |  |          |      |  |  |  |                  |  |  |  |  |  |  |  |                    |  |  |  |  |  |  |  |         |  |  |  |  |  |
| 1.47  | <p>Details on the Forest Clearance should be given as per the format given:</p> <table border="0" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 15%;"></td> <td style="width: 15%;">Total ML Total</td> <td style="width: 15%;"></td> <td style="width: 15%;">Date</td> <td style="width: 15%;">Extent</td> <td style="width: 15%;">Balance area for which</td> <td style="width: 15%;">Status of appl</td> <td style="width: 15%;">For</td> </tr> <tr> <td></td> <td>Project Area Forest</td> <td></td> <td>of FC</td> <td>of Forest Land</td> <td>FC is yet to be</td> <td>diversion of forest</td> <td>land</td> </tr> <tr> <td></td> <td>(ha)</td> <td>land (ha)</td> <td></td> <td></td> <td>obtained</td> <td>land</td> <td></td> </tr> <tr> <td></td> <td></td> <td>If more than one</td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td></td> <td></td> <td>provide details of</td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td></td> <td></td> <td>each FC</td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> </table> |                    | Total ML Total |                | Date                   | Extent              | Balance area for which | Status of appl | For |  | Project Area Forest |  | of FC | of Forest Land | FC is yet to be | diversion of forest | land |  | (ha) | land (ha) |  |  | obtained | land |  |  |  | If more than one |  |  |  |  |  |  |  | provide details of |  |  |  |  |  |  |  | each FC |  |  |  |  |  |
|       | Total ML Total   |                    | Date           | Extent         | Balance area for which | Status of appl      | For                    |                |     |  |                     |  |       |                |                 |                     |      |  |      |           |  |  |          |      |  |  |  |                  |  |  |  |  |  |  |  |                    |  |  |  |  |  |  |  |         |  |  |  |  |  |
|       | Project Area Forest  |                    | of FC          | of Forest Land | FC is yet to be        | diversion of forest | land                   |                |     |  |                     |  |       |                |                 |                     |      |  |      |           |  |  |          |      |  |  |  |                  |  |  |  |  |  |  |  |                    |  |  |  |  |  |  |  |         |  |  |  |  |  |
|       | (ha)   | land (ha)          |                |                | obtained               | land                |                        |                |     |  |                     |  |       |                |                 |                     |      |  |      |           |  |  |          |      |  |  |  |                  |  |  |  |  |  |  |  |                    |  |  |  |  |  |  |  |         |  |  |  |  |  |
|       |  | If more than one   |                |                |                        |                     |                        |                |     |  |                     |  |       |                |                 |                     |      |  |      |           |  |  |          |      |  |  |  |                  |  |  |  |  |  |  |  |                    |  |  |  |  |  |  |  |         |  |  |  |  |  |
|       |  | provide details of |                |                |                        |                     |                        |                |     |  |                     |  |       |                |                 |                     |      |  |      |           |  |  |          |      |  |  |  |                  |  |  |  |  |  |  |  |                    |  |  |  |  |  |  |  |         |  |  |  |  |  |
|       |  | each FC            |                |                |                        |                     |                        |                |     |  |                     |  |       |                |                 |                     |      |  |      |           |  |  |          |      |  |  |  |                  |  |  |  |  |  |  |  |                    |  |  |  |  |  |  |  |         |  |  |  |  |  |
| 1.48  | In case of expansion of the proposal, the status of the work done as per mining plan and approved  |                    |                |                |                        |                     |                        |                |     |  |                     |  |       |                |                 |                     |      |  |      |           |  |  |          |      |  |  |  |                  |  |  |  |  |  |  |  |                    |  |  |  |  |  |  |  |         |  |  |  |  |  |

| S. No | Terms of Reference  |
|-------|---|
|       | mine closure plan shall be detailed in EIA/ EMP report  |
| 1.49  | Details on Public Hearing should cover the information relating to notices issued in the newspaper, proceedings/minutes of Public Hearing, the points raised by the general public and commitments made by the proponent and the time bound action proposed with budgets in suitable time frame. These details should be presented in a tabular form. If the Public Hearing is in the regional language, an authenticated English Translation of the same should be provided. |
| 1.50  | PP shall carry out survey through drone highlighting the ground reality for atleast 10 minutes  |
| 1.51  | Detailed Chronology of the project starting from the first lease deed allotted/Block allotment/ Land acquired to its No. of renewals, CTO /CTE with details of no. renewals, previous EC(s) granted details and its compliance details, NOC details from various Govt bodies like Forest NOC(s), CGWA permissions, Power permissions, etc as per the requisites respectively to be furnished in tabular form.   |
| 1.52  | The first page of the EIA/ EMP report must mention the peak capacity production, area, detail of PP, Consultant (NABET accreditation) and Laboratory (NABL / MoEF & CC certification)   |
| 1.53  | The compliances of ToR must be properly cited with respective chapter section and page no in tabular form and also mention sequence of the respective ToR complied within the EIA-EMP report in all the chapter,s section.  |
| 1.54  | PP to evaluate the green house emission gases from the mine operation and corresponding carbon absorption plan.   |



**Signature Not Verified**

Digitally Signed by : A R Rahul Nadh IAS  
Member Secretary, SEIAA

Date: 31/05/2024

From

Thiru. V. Sasikumar, M.Sc.,  
Assistant Director,  
Geology and Mining,  
Erode

To

Thiru. N.T. Saisadha,  
S/o. Thyagaraj,  
No, 12, Gandhiji 3<sup>rd</sup> street,  
Karur Bypass,  
Erode - 638 002.

**R.c. No. 152/ Mines / 2023 dated: 04.03.2024.**

Sub: Mines and Minerals – Minor Mineral – Rough Stone and Gravel- Erode District - Sathyamangalam Taluk - Kurumbapalayam Village- S.F.Nos. 151 (part) and 152/4 - Over an Extent of 2.28.40 Hectares of patta land- Quarry lease for Rough Stone and Gravel - Application preferred by Thiru. N.T. Saisadha - Precise area communicated for the proposed grant of quarry lease - Mining Plan Submitted for approval - approved - further details requested - furnished regarding.

- Ref: 1. Application for Rough Stone and Gravel quarry permission preferred by N.T. Saisadha dated: 16.03.2023 (Received on 21.03.2023).
2. G.O. Ms. No. 79 / Industries (MMC 1) Department dated 06.04.2015.
3. The Assistant Director, Geology and Mining, Erode letter R.C. No. 152/Mines/2023 dated 12.02.2024.
4. Mining Plan submitted by Thiru. N.T. Saisadha letter dated: Nil (Received on 26.02.2024).
5. This office letter even no. dated. 04.03.2024 (Mining Plan approved).
6. Thiru. N.T. Saisadha letter dated 04.03.2024.

\*\*\*\*\*

In the reference 3<sup>rd</sup> cited, precise area was communicated to the applicant Thiru. N.T. Saisadha for submission of mining plan, for grant of Rough Stone quarry lease, over an extent of 2.28.40 hectares, comprising in S.F.Nos 151 (part) and 152/4 of Kurumbapalayam Village of Sathyamangalam Taluk, Erode District. As directed the applicant submitted the mining plan and same was approved vide reference 5<sup>th</sup> cited.

As requested by the applicant, the details of existing, proposed and expired quarries situated within the radius of 500 meters from the subject area are furnished as follows:-

1. Existing quarries:

| SNo | Name of the Applicant | S.F.Nos         | Extent (Hect) | Lease Details  |
|-----|-----------------------|-----------------|---------------|--|
| 1.  | N.T. Saisada          | 152/2 and 152/3 | 1.64.5 Hect   | R.C. No. 22023/2017/X-1 dated 23.12.2021. (23.12.2021 to 22.12.2026) |

2. Proposed quarries :

| Sl.No | Name of the Applicant | S.F.Nos                                 | Extent (Hect) | Date of application               |
|-------|-----------------------|---|---------------|-----------------------------------|
| 1.    | C.Raja                | 138/2A(P), 138/3A(P) and 138/4(P)       | 1.41.96 Hect  | 24.03.2018 (Mining Plan approved) |
| 2.    | Thirunavukarasu       | 148/1, 148/11, 148/12, 148/13 and 157/1 | 2.18.0 Hect   | 02.05.2022                        |
| 3.    | N.T. Saisada          | 151 (part) and 152/4                    | 2.28.40 Hect  | 16.03.2023                        |
| 4.    | S. Veenish            | 178                                     | 2.96.50 Hect  | 27.12.2023                        |

3. Lease expired and abandoned quarries:

| SNo | Name of the Applicant | S.F.Nos             | Extent(Hect) | Lease Period             |
|-----|-----------------------|---------------------|--------------|--------------------------|
| 1.  | M. Ramasamy           | 139/2, 139/3, 139/4 | 3.13.5       | 10.08.2016 to 09.08.2021 |

*[Signature]*  
Assistant Director,  
Geology and Mining,  
Erode

*[Signature]*  
1/3/24

*[Signature]*  
1/3/24



From

Thiru. V. Sasikumar, M.Sc.,  
Assistant Director,  
Geology and Mining,  
Erode

To

Thiru. N.T. Saisadha,  
S/o. Thyagaraj,  
No, 12, Gandhiji 3<sup>rd</sup> street,  
Karur Bypass,  
Erode - 638 002.

**R.c. No. 152/ Mines / 2023 dated: 04.03.2024.**

Sub: Mines and Minerals – Minor Mineral – Rough Stone and Gravel- Erode District - Sathyamangalam Taluk - Kurumbapalayam Village- S.F.Nos. 151 (part) and 152/4 - Over an Extent of 2.28.40 Hectares of patta land- Quarry lease for Rough Stone and Gravel - Application preferred by Thiru. N.T. Saisadha - Precise area communicated for the proposed grant of quarry lease - Mining Plan Submitted for approval - Approved - regarding.

- Ref: 1. Application for Rough Stone and Gravel quarry permission preferred by N.T. Saisadha dated: 16.03.2023 (Received on 21.03.2023).  
2. G.O. Ms. No. 79 / Industries (MMC 1) Department dated 06.04.2015.  
3. The Assistant Director, Geology and Mining, Erode letter R.C. No. 152/Mines/2023 dated 12.02.2024.  
4. Mining Plan submitted by Thiru. N.T. Saisadha letter dated: Nil (Received on 26.02.2024).

\*\*\*\*\*

Thiru. N.T. Saisadha preferred an application for the grant of Rough Stone and Gravel quarry lease over an extent of 2.28.40 Hectare of Patta land in S.F.Nos 151 (part) and 152/4 of Kurumbapalayam Village of Sathyamangalam Taluk, Erode District vide the reference 1<sup>st</sup> cited and the precise area was communicated to the applicant vide the reference 3<sup>rd</sup> cited with a direction to submit the approved mining plan and Environmental Clearance.

As directed, the applicant submitted three copies of mining plan for approval vide the reference 4<sup>th</sup> cited. The Mining Plan has been verified in detail and found that it was prepared in accordance with the guidelines / instructions issued by the Commissioner of Geology and Mining in letter RC. No. 3868 / LC / 2012 dated 19.11.2012.

Therefore in exercise of the powers conferred under Rule 41(2) of Tamil Nadu Minor Mineral Concession Rules, 1959, read with G.O. (Ms). No.79 / Industries (MMC 1) Department dated 06.04.2015, the mining plan is hereby approved, subject to the following conditions:

- (i) The mining plan is approved without prejudice to any other Law applicable to the quarry lease from time to time whether such laws are made by the Central Government, State Government or any other authority.
- (ii) This approval of the mining plan does not in any way convey the approval of the Government in terms or any other provisions of the Mines and Minerals (Development and Regulation) Act, 1957, or any other connected laws including Forest (Conservation) Act, 1980, Forest Conservation Rules, 1981, Environment Protection Act, 1980, Explosives Act, 1884 (Central Act IV of 1884) Minor Mineral Concession and Development Rules, 2010 and the Rules made there under and the Tamil Nadu Minor Mineral Concession Rules, 1959.
- (iii) The mining plan is approved without prejudice to any other order or direction from any court of competent jurisdiction.
- (iv) The validity of the mining plan is co-terminus with the lease period.
- (v) Quarrying shall be done in accordance with the approved Mining Plan and that the mining plan is approved without prejudice to any other law applicable to the quarry lease from time to time whether such laws are made by the Central Government, State Government or any other authority.
- (vi) If anything is found to be concealed as required by the Mines Act in the contents of the Mining Plan and the proposal for rectification has not been made, the approval shall be deemed to have been withdrawn with immediate effect.
- (vii) A safety distance of 7.5 meters shall be provided for the patta lands situated adjacent to the applied area.

Encl.: Approved Mining Plan.

*Amr/15/2024*  
Assistant Director,  
Geology and Mining,  
Erode

*Amr/15/2024*

*Amr/15/2024*

# MINING PLAN AND PROGRESSIVE QUARRY CLOSURE PLAN FOR KURUMBAPALAYAM ROUGH STONE AND GRAVEL QUARRY

(PREPARED UNDER RULES 41 & 42 AS PER THE AMENDED UNDER TAMIL NADU GENERAL CONCESSION RULES, 1959)

Patta Land/ Lease period = Ten years

IN

LOCATION OF THE QUARRY LEASE APPLIED AT

EXTENT : 2.28.40 Ha  
S.F.Nos. : 151 (PART) AND 152/4,  
VILLAGE : KURUMBAPALAYAM  
TALUK : SATHYAMANGALAM  
DISTRICT : ERODE  
STATE : TAMIL NADU

FOR

## APPLICANT

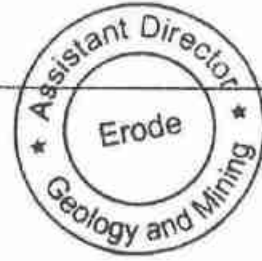
**Thiru. N.T. Saisada,**  
S/o. Thyagaraj,  
No. 12, Gandhiji 3<sup>rd</sup> Street,  
Karur Bypass, Erode District,  
Tamil Nadu State- 638 002.  
Mobile No. +91 99866 00066.

## PREPARED BY

**B. VENGADAGIRI, M.Sc.,**  
Qualified Person

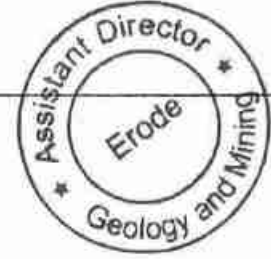
No.105, 5<sup>th</sup> Cross, Alagapuram,  
Salem District - 636 010,  
Mobile No.: +91 86953 32233.  
E-Mail: vengatb6@gmail.com





### ABBREVIATIONS

- EIA - Environmental Impact Assessment
- SEAC - State Expert Appraisal Committee
- SEIAA - State Level Environment Impact Assessment Authority
- MoEF&CC - Ministry of Environment, Forest and Climate changes
- MSL - Mean Sea Level
- CPCB - Central Pollution Control Board
- TNPCB - Tamil Nadu Pollution Control Board
- S.F.No. - Survey Field Number
- DMS - Director of Mines Safety
- DGMS - Director General of Mines Safety
- MMR - Metalliferous Mines Regulations
- MCR - Minerals (Other than Atomic and Hydro Carbons Energy Minerals) Concession Rules
- TNMMCR - Tamil Nadu Minor Mineral Concession Rules
- EMP - Environment Management Plan
- NONEL - Non Electric
- PPV - Peak Particle Velocity
- CRZ - Coastal Regulatory Zone
- HACA - Hill Area Conservation Authority
- QP - Qualified Person



**N.T. Saisada,**  
S/o. Thyagaraj,  
No. 12, Gandhiji 3<sup>rd</sup> Street,  
Karur Bypass, Erode District,  
Tamil Nadu State- 638 002.  
Mobile No. +91 99866 00066.

**CONSENT LETTER FROM THE APPLICANT**

The Mining Plan and Progressive Quarry Closure Plan in Respect of Kurumbapalayam Rough Stone and Gravel Quarry lease applied area over an extent of 2.28.40 Hectares Patta lands in S.F.Nos. 151 (Part) and 152/4 of Kurumbapalayam Village, Sathyamangalam Taluk, Erode District, Tamil Nadu State has been prepared by

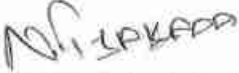
**B. VENGADAGIRI, M.Sc.,**  
Qualified Person

I have entrusted the works to prepare the Mining Plan based upon the production requirements to me as per the Mines Acts, Rules, Regulations and Amendments as on date. I request to the Assistant Director, Department of Geology and Mining, Erode District, Tamil Nadu State to make further correspondence regarding the modification of the Mining Plan with the said Qualified Person at his following address.

**B. VENGADAGIRI, M.Sc.,**  
No.105, 5<sup>th</sup> Cross, Alagapuram,  
Salem District – 636 010,  
Mobile No.: +91 86953 32233.

I hereby undertake that all the responsibilities of contents in the Mining Plan and if any corrections made in the Mining Plan by the Qualified Person may be deemed to have been made with our knowledge and consent and shall be acceptable to me and binding on me in all respects. If there is any substantial change during operation we will carry out a Modified Mining plan and seek its approval from concerned Authorities.

Signature of the Applicant

  
(N.T. Saisada)

Place: Erode

Date: 14.02.2024




**N.T. Saisada,**  
S/o. Thyagaraj,  
No. 12, Gandhiji 3<sup>rd</sup> Street,  
Karur Bypass, Erode District,  
Tamil Nadu State- 638 002.  
Mobile No. +91 99866 00066.

**DECLARATION OF THE APPLICANT**

The Mining Plan and Progressive Quarry Closure Plan in Respect of Kurumbapalayam Rough Stone and Gravel Quarry lease applied area over an extent of 2.28.40 Hectares Patta lands in S.F.Nos. 151 (Part) and 152/4 of Kurumbapalayam Village, Sathyamangalam Taluk, Erode District, Tamil Nadu State has been prepared in full consultation with me.

I have understood its contents and agree to implement the same in accordance with Laws, Rules and Act applicable to quarry from time to time as per Tamil Nadu Minor Mineral Concession Rules, 1959.

Signature of the Applicant

  
(N.T. Saisada)

Place: Erode

Date: 23.02.2024



## CERTIFICATE

Certified that I am, **B. VENGADAGIRI, M.Sc.**, residing at No.105, 5<sup>th</sup> Cross, Alagapuram, Salem District – 636 010, Tamil Nadu, holding a Post Graduate Degree in Geology (M.Sc., Applied Geology) from Annamalai University, Chidambaram and I worked in the field of Geology in a role of Geologist.

Rule 15(I)(a) and (b) of Minerals (Other than Atomic and Hydro Carbons Energy Minerals) Concession Rules, 2016 stipulates the eligibility for preparing Mining plans as “(I)(a) a degree in mining engineering or a post-graduate degree in geology granted by a university established” and (I)(b) “Professional experience of five years of working in a supervisory capacity in the field of mining after obtaining the degree”. Since my qualification and experience are satisfied the Rule (I)(a) and (I)(b) of 15 of the said Rules, I am eligible to prepare Mining Plans for both Major and Minor Minerals.

Accordingly, I prepared this Mining Plan and Progressive Quarry Closure Plan in Respect of Kurumbapalayam Rough Stone and Gravel Quarry over an extent of 2.28.40 Hectares Patta lands in S.F.Nos. 151 (Part) and 152/4 of Kurumbapalayam Village, Sathyamangalam Taluk, Erode District for **Thiru. N.T. Saisada**, S/o. Thyagaraj, residing at No. No. 12, Gandhiji 3<sup>rd</sup> Street, Karur Bypass, Erode District, Tamil Nadu State– 638 002. Since the Mining Plan is prepared as per the provisions contained in Rule 15(I)(a) and (I)(b) of Minerals (Other than Atomic and Hydro Carbons Energy Minerals) Concession Rules, 2016.

Signature of the Qualified Person



B. VENGADAGIRI, M.Sc.,

Place: Salem

Date: 23.02.2024

**B. VENGADAGIRI, M.Sc.,**  
No.105, 5<sup>th</sup> Cross, Alagapuram,  
Salem District – 636 010,  
Mobile No.: +91 86953 32233



**CERTIFICATE FROM THE QUALIFIED PERSON**

This is to certify that the Provisions of Prepared under Rules 41 & 42 as Amended in Tamil Nadu Minor Mineral Concession Rules, 1959. The preparation of Mining Plan and Progressive Quarry Closure Plan for Kurumbapalayam Rough Stone and Gravel Quarry lease applied area over an extent of 2.28.40 Hectares Patta lands in S.F.Nos. 151 (Part) and 152/4 of Kurumbapalayam Village, Sathyamangalam Taluk, Erode District, Tamil Nadu State has been prepared for

**Thiru. N.T. Saisada,**  
S/o. Thyagaraj,  
No. 12, Gandhiji 3rd Street,  
Karur Bypass, Erode District,  
Tamil Nadu State– 638 002.  
Mobile No. +91 99866 00066.

Whenever specific permissions / exemptions / relaxations and approvals are required, the applicant will approach the concerned authorities of the Assistant Director, Department of Geology and Mining, Erode District, Tamil Nadu State 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.

Signature of the Qualified Person

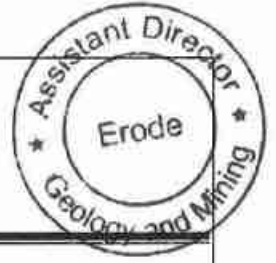
  
B. VENGADAGIRI, M.Sc.,

Place: Salem

Date: 23.02.2024



**B. VENGADAGIRI, M.Sc.,**  
No.105, 5<sup>th</sup> Cross, Alagapuram,  
Salem District – 636 010,  
Mobile No.: +91 86953 32233



**CERTIFICATE FROM THE QUALIFIED PERSON**

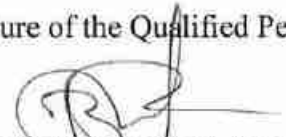
Certified that the Provisions of Mines Act, Rules and Regulations or Orders made there under have been observed in the preparation of Mining Plan and Progressive Quarry Closure Plan for Kurumbapalayam Rough Stone and Gravel Quarry lease applied area over an extent of 2.28.40 Hectares Patta lands in S.F.Nos. 151 (Part) and 152/4 of Kurumbapalayam Village, Sathyamangalam Taluk, Erode District, Tamil Nadu State has been prepared for

**Thiru. N.T. Saisada,**  
S/o. Thyagaraj,  
No. 12, Gandhiji 3rd Street,  
Karur Bypass, Erode District,  
Tamil Nadu State– 638 002.  
Mobile No. +91 99866 00066.

Whenever specific permissions / exemptions / relaxations and approvals are required, the Applicant will approach the concerned authorities of Director of Mines Safety (DMS), No.5, II Street, Block-AA, Anna Nagar, Chennai-40, Tamil Nadu State 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.

Signature of the Qualified Person

  
B. VENGADAGIRI, M.Sc.,

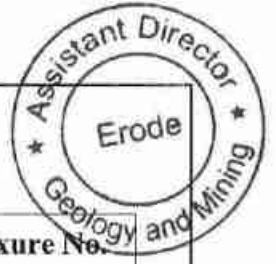
Place: Salem

Date: 23.02.2024



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## MINING PLAN ALONG WITH PROGRESSIVE QUARRY CLOSURE PLAN FOR KURUMBAPALAYAM ROUGH STONE AND GRAVEL

(PREPARED UNDER RULES 41 & 42 AS PER THE AMENDMENT OF TAMIL NADU MINOR MINERAL CONCESSION RULES, 1959)

### 1.0 INTRODUCTION AND EXECUTIVE SUMMARY

The applicant **Thiru. N.T. Saisada**, S/o. Thyagaraj, residing at No. 12, Gabdhiji 3<sup>rd</sup> Street, Karur bypass, Erode District, Tamil Nadu – 638 002 has entrust and given consent to preparation of Mining plan and Progressive Mine Closure Plan as per the provisions of Mines Act, Rules, Regulations and as amended till date.

The Applicant has applied quarry lease for quarrying of Rough stone and Gravel over an extent of 2.28.40 Hectares Patta lands in S.F.Nos. 151 (Part) and 152/4 of Kurumbapalayam Village, Sathyamangalam Taluk, Erode District, Tamil Nadu State for a period of ten years under Rules 19 (1), 20 and 22 of Tamil Nadu Minor Mineral Concession Rules, 1959. The following are the statutory requirements with respect to Rough stone and Gravel quarry (Refer Annexure No. I).

1. Thiru. N.T. Saisada, S/o. Thyagarajan, his application Dated: 16.03.2023 (Application received on 21.03.2023).
2. The Block Development officer (கி.ஊ), Bhavanisagar letter Rc.No. 1108/2020/AA1 dated: 23.05.2023.
3. Deputy Director (i/c.), District Urban Development, Erode letter Rc.No. 696/2023/EM-3 dated: 26.05.2023.
4. Revenue Tahsildar, Sathyamangalam letter Rc. No. 2155/2023/A3 dated: 10.05.2023.
5. Revenue Division Officer, Gopichettipalayam letter Rc.No. 2762/2023/AA3 dated: 10.05.2023.
6. Deputy Director (FAC), Forest Department of Sathyamangalam, letter RC.No.2053/2023/F, dated:30.06.2023.
7. Deputy Director, Department of Geology and Mining, Erode, inspection report dated: 28.07.2023.
8. Government Order No. 169 Industries (M.M.C.1) Department, Dated: 04.08.2020.
9. Precise Area Communication issued by Deputy Director, Department of Geology and Mining, Erode, letter Roc. No. 152/Mines/2023, dated: 12.02.2024.

The application was examined, Scrutinized, Inspected and processed by the Deputy Director, Department of Geology and Mining, Erode and issued a Precise Area Communication letter vide letter **Roc. No. 152/Mines/2023, dated: 12.02.2024** for preparation of Mining plan as per the Rule 41 & 42 of Tamil Nadu Minor Mineral Concession Rules, 1959 within 90 days and getting approval from the Department of Geology and Mining, Erode to obtain Environmental Clearance from the State Level Environment Impact Assessment Authority (SEIAA), Tamil Nadu, with the following conditions to provide (Refer Annexure No. I):

**General Conditions:**

- i. A safety distance of 7.5 meters should be provided to the adjacent patta lands from the lease applied area.

**Specific conditions as prescribed in the precise area communication letter:**

There is no Specific conditions as prescribed in the precise area communication letter.

This Mining Plan along with Progressive Mine closure Plan is prepared in full consultation with **Thiru. N.T. Saisada**, S/o. Thyagaraj, residing at No. 12, Gabdhiji 3<sup>rd</sup> Street, Karur bypass, Erode District, Tamil Nadu – 638 002 for Rough stone and Gravel quarry over an extent of 2.28.40 Hectares Patta lands in S.F.Nos. 151 (Part) and 152/4 of Kurumbapalayam Village, Sathyamangalam Taluk, Erode District, Tamil Nadu State under Rules 19(1), 20 and 22 of Tamil Nadu Minor Mineral Concession Rules, 1959 with obtained full consent as per the application and Production schedule in preparation of Mining plan as per the provisions of Mines Act, Rules, Regulations as on date.

The Mining plan has been prepared after carrying the field survey, collection of Primary & secondary data, environmental setting, geological features and tentatively estimated the Resources & Reserves, depth of mining as identified in the field with best our knowledge and experience. This mining plan is prepared by considering the Rule 41 & 42 as Amended in Tamil Nadu Minor Mineral Concession Rules, 1959 and as per the EIA Notification 2006 and its subsequent Amendments.

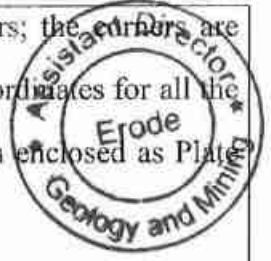
In order to ensure compliance of the order of the Honourable Supreme Court Dated: 27.02.2012 in I.A.No.12-13 of 2011 in Special Leave Petition (SLP) (C) No 19628-19629/2009, it has been now decided that all mining projects of minor minerals including their renewal is require prior environmental clearance. As per amendment in EIA Notification 2006 vide S.O. 1886(E), Dated:20.04.2022 “All mining lease area in respect of minor mineral mining leases and  $\leq$  250 ha mining lease area in respect of major mineral mining lease other than coal” would be treated as category B and will be considered by the state notified by Ministry of Environment, Forest and Climate Change as prescribed procedure under EIA notification 2006.

The field survey carried out by the Qualified Person and Team as on 16.02.2024

**Short Notes of Mining plan:**

- a. Village Panchayat - Kurumbapalayam
- b. Panchayat Union - Sathyamangalam
- c. Total extent of the lease applied area is 2.28.40 Ha.
- d. Topography of the area - The area exhibits plain topography.
- e. The Estimated Geological Resources are **6,85,200m<sup>3</sup>** of Rough stone, **2,28,400m<sup>3</sup>** of Weathered Rock and **22,840m<sup>3</sup>** of Gravel in the entire area.
- f. Tentative total Mineable Reserves are **1,45,660m<sup>3</sup>** of Rough stone, **1,35,030m<sup>3</sup>** of Weathered Rock and **15,582m<sup>3</sup>** of Gravel in the entire area.
- g. The proposed quantity of reserves/ (level of production) to be mined are **1,45,660m<sup>3</sup>** of Rough stone (**80,530m<sup>3</sup>** for **first five years** and **65,130m<sup>3</sup>** for **second five years period**) for Ten years, **1,35,030m<sup>3</sup>** of Weathered Rock and **15,582m<sup>3</sup>** of Gravel for first three years in the entire area.
- h. Proposed Depth of mining = 41m below ground level.
- i. Lease Period = Ten years
- j. Mining Plan Period = Five years
- k. It is a fresh lease applied area, at present the area is virgin. Hence no existing pit.
- l. Method of mining / level of mechanization.  
Opencast mechanized method, the quarry operation involves shallow jack hammer drilling, slurry blasting with NONEL initiation.
- m. Type of machineries proposed in the quarrying operation is given below.  
Excavators attached with bucket and rock breaker.  
Hand Jack hammer, Compressor (Diesel drive) (4 Jack Hammer capacity).
- n. No trees will be uprooted due to this quarry operation.
- o. The approach road from the main road to quarry is already existence; the same will be maintained in good condition for the haulage of quarry materials and machineries.
- p. There is No Export of this Rough stone and Gravel.
- q. Topo sketch covering 10km and 1km radius around the proposed area with markings of habitations, water bodies including streams, rivers, roads, major structure like bridges, wells, archaeological importance and places of worships is marked and enclosed as Plate Nos. IA & IB.

- r. The lease applied area is about 2.28.40Ha bounded by eleven corners; the corners are designated as 1-11 clockwise from the Southwest corner and the Co-ordinates for all the corners are clearly marked in the Quarry Lease Plan and Surface Plan enclosed as Plate No. II.
- s. The plans of proposed quarrying area showing the dimensions of the pit, their proposed depth and maximum area of proposed quarrying are enclosed as Plate Nos. III, III-A and IV.
- t. General conditions will not applicable for the proposed area. The area applied for lease is 10Km away from the,
- i) *Interstate Boundary,*
  - ii) *Critically polluted areas as identified by CPCB,*
- u. Sathyamangalam Tiger Reserve is situated at a distance of 8.77Km on Northwestern side of the lease applied area.
- v. Sathyamangalam Tiger Reserve (Eco Sensitive Zone) is situated at a distance of 7.77Km on Northwestern side of the lease applied area.
- w. There is no waste anticipated during this quarry operation, hence waste dump is not proposed in the lease applied area.
- x. Around 27 employees are proposed to deploying the quarrying operation.
- y. Total Cost of the project is about **Rs.93,64,000/-**.



**2.0 GENERAL INFORMATION**

**2.1 a) Name of the Applicant :** Thiru. N.T. Saisada,  
S/o. Thyagaraj,

**b) Address of the Applicant (With Phone No and Aadhaar No.)**

Address : No. 12, Gandhiji 3<sup>rd</sup> Street,  
Karur bypass,  
Erode District,

State with Pin Code : Tamil Nadu – 638 002.

Mobile No : +91 99866 00066

Aadhaar No : 8469 1057 5795

E-mail : ntsaisada@gmail.com

**c) Status of the Applicant (Individual / Company / Firm):**

The Applicant is an Individual.

**2.2 a) Mineral which the Applicant intends to mine:**

The Applicant intends to quarry Rough stone and Gravel only.

**b) Precise area communication letter details received from the Competent Authority of the Government:**

The precise area communication letter was received from the Assistant Director, Department of Geology and Mining, Erode District vide **R.C. No. 152/Mines/2023, dated 12.02.2024** (Refer Annexure No. I) and was given to us for the preparation of mining plan to meet out the applicant production schedule.

**c) Period of permission / lease to be granted:**

Ten Years as mentioned in Precise area Communication letter.

**d) Name and address of the Qualified Person who preparing the Mining Plan:**

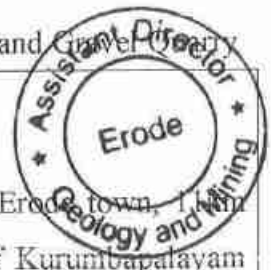
Name : **B. VENGADAGIRI, M.Sc.,**  
Qualified Person (Under Rule 15(I)(a) and (I)(b) of MCR, 2016)

Address : No.105, 5<sup>th</sup> Cross,  
Alagapuram,  
Salem District – 636 010.

Mobile : +91 86953 32233

Email : vengatb6@Gmail.com

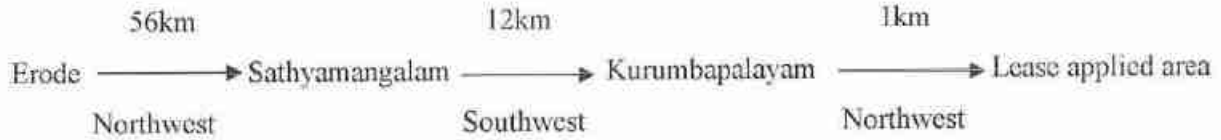




**3.0 LOCATION**

**a) Details of the area with location map:**

The lease applied area is located about 62km Northwestern side of Erode town, 12km Southwestern side of Sathyamangalam town and 1km Northwestern side of Kurumbapalayam Village.



**Location Map of the Lease Applied area**

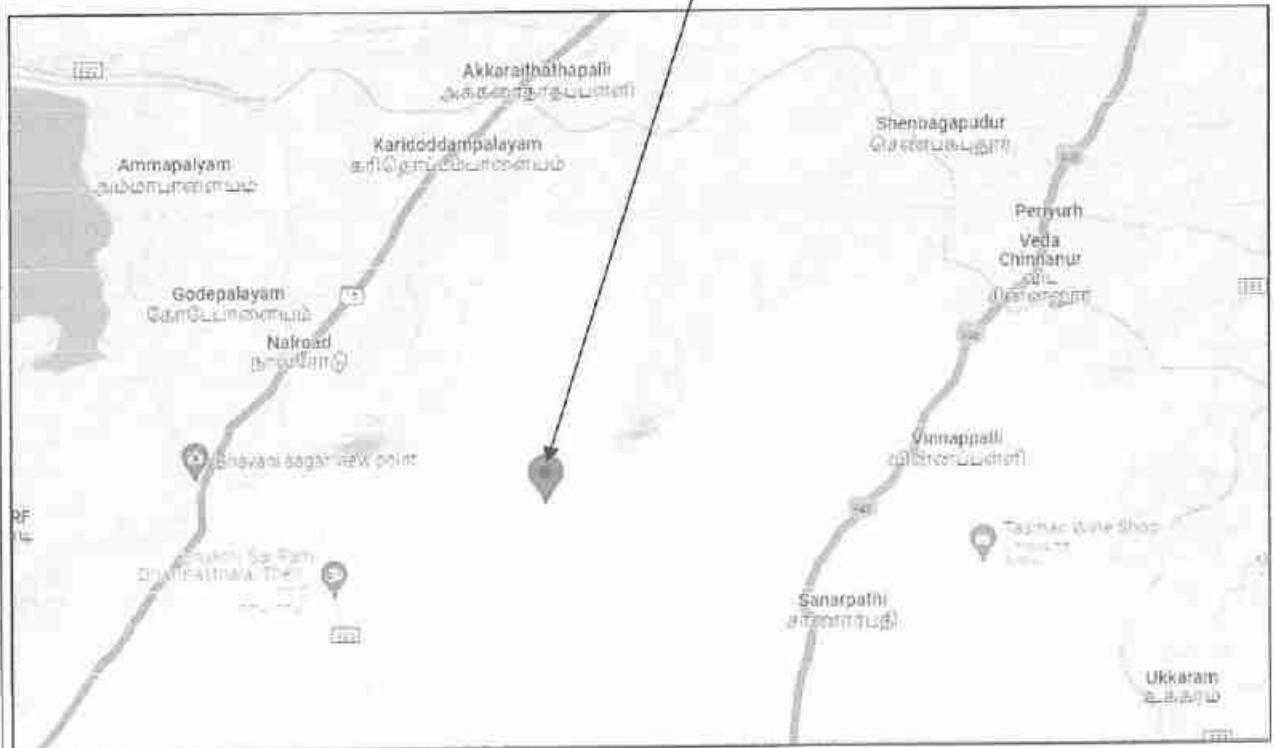
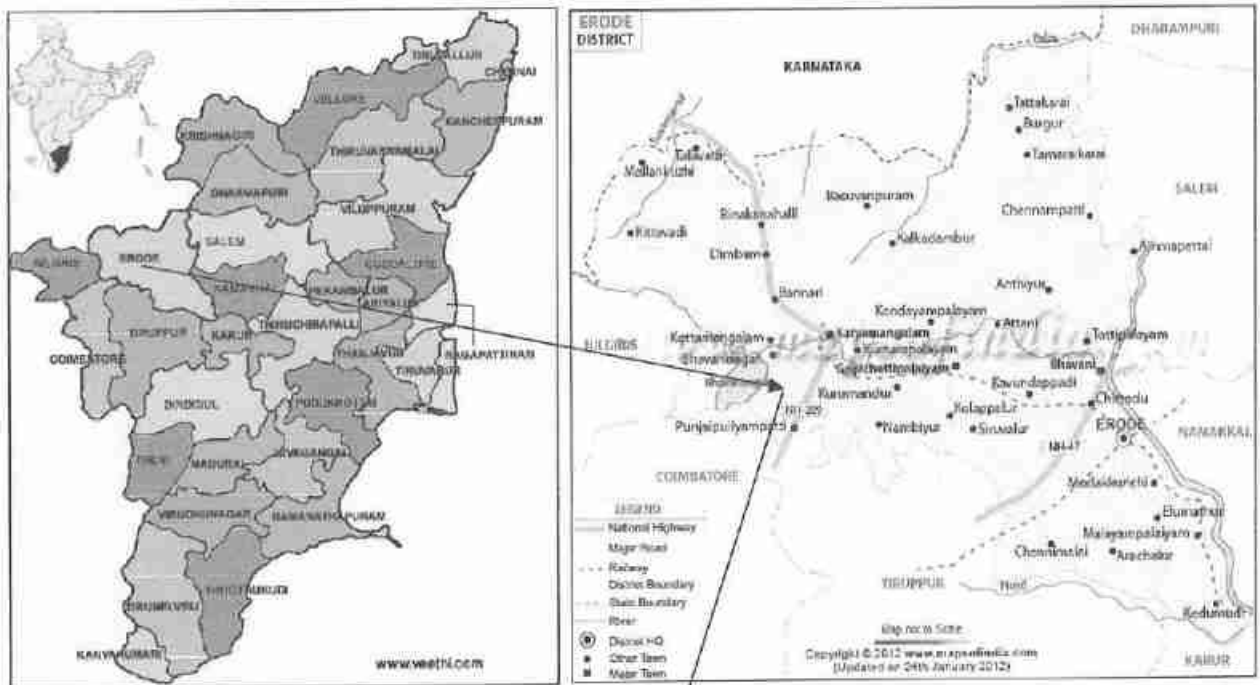


Table - I

| District            | Taluk          | Village        | S.F. No.   | Area (Ha.)     | Patta No. |
|---------------------|----------------|----------------|------------|----------------|-----------|
| Erode               | Sathyamangalam | Kurumbapalayam | 151 (Part) | 1.29.90        | 988       |
|                     |                |                | 152/4      | 0.98.50        |           |
| <b>Total Extent</b> |                |                |            | <b>2.28.40</b> |           |

Source: As per the FMB and 'A' register record furnished by the applicant.

**b) Classification of the area (Ryotwari/ Poramboke / others):**

It is Patta lands, classified as Punsei (Barren land) (Refer Annexure Nos. IV & VI).

**c) Ownership / Occupancy of the applied area (surface right):**

It is Patta lands, registered in the name of applicant (Thiru.N.T.Saisada) vide patta Nos. 988 and 993 (Refer Annexure Nos. IV & VI).

**d) Toposheet No. with latitude and longitude:**

The lease applied area falls in the Toposheet No: 58 E/03 Latitude between: 11°25'51.36"N to 11°25'55.19"N and Longitude between: 77°10'07.83"E to 77°10'18.95"E on WGS datum-1984. Please refer the Plate Nos. I to II as per the GSI Toposheet.

**e) Existence of public road / Railway line, if any nearby and approximate distance:**

The approach road is situated on the Northern side, which is connects to the Village Road is located at 1.2km on the Southeastern side of the lease applied area.

Road access is available from the quarry to state highways and National Highway, no towns are enrooted hence the traffic density is not much more due to the transportation of Rough stone and Gravel.

The approach road from the quarry is already existence and the same will be utilized for haulage and maintained during the entire lease period.

The Nearest Railway line is Coimbatore - Mettupalayam which is located about 29km on the Southwestern side of the area as per the GSI Toposheet and Google Map.

**PART - A**

**4.0 GEOLOGY AND MINERAL RESERVES**

**4.1 Brief description of the Topography and general Geology of the area (with plans):**

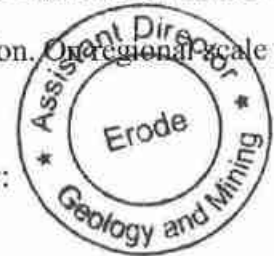
The lease applied area is exhibits plain topography. The area has gentle sloping towards Southeastern side and altitude of the area is 330m above from Mean Sea Level. The area is covered by 1m thickness of Gravel, 10m thickness of Weathered Rock and followed by Massive Charnockite which is clearly inferred from the nearby existing quarry pit situated on the Eastern side.

The Water level in the surrounding area is 68m - 73m below from general ground profile which is observed from the nearby bore wells. Average annual rainfall is about 722mm.

Peninsular gneiss forms the oldest rock formations, in which the massive formation of Charnockite lies over with rich accumulation of recent quaternary formation. On regional scale of the Charnockite body is  $N75^{\circ}E - S75^{\circ}W$  with Vertical dipping.

The general geological sequences of the rocks in this area are given below:

| ↑ | AGE                    | FORMATION                       |
|---|------------------------|---------------------------------|
|   | Recent                 | - Quaternary formation (Gravel) |
|   | -----Unconformity----- |                                 |
|   | Archaean               | - Charnockite                   |
|   |                        | Peninsular Gneissic complex     |



#### 4.2 Details of exploration already carried out if any:

State Geology and Mining Dept, Govt. of Tamil Nadu, has carried out the regional prospecting and exploration in these areas during 1992 to 1993.

Geological Survey of India has carried out detailed mapping in Erode District. Besides, the Qualified Person and his team members made a detailed geological study of the proposed area. The Rough stone formation is clearly inferred from the nearby existing quarry pit situated on the Eastern side.

#### 4.3 Estimation of Reserves:

##### a) Geological Resources with geological sections on a scale of 1:1000 / 1:2000

As far as Rough stone (Charnockite) is concerned, the only practical method is the systematic geological mapping and delineation of Rough stone within the field and careful evaluation of body luster, physical properties, engineering properties, commercial aspects etc.,

Totally three sections have been drawn, one section drawn length wise as (X-Y) and other two cross sections are drawn horizontally as (A-B and C-D) Width wise to cover the maximum area considered for lease upto 41m depth.

The Topographical, Geological plan and sections demarcated the commercial marketable Rough stone (Charnockite) deposit has been prepared in the scale of 1:1000 (please refer the Geological plan and sections Plate Nos. III and III-A). As the sale of Rough stone are in terms of cubic metres (Volume) only and not in terms of tonnage. No Exploration has been carried out.

**Estimation of Geological Resources (Plate No. III):**

The Geological Resources of Rough Stone and Gravel are calculated upto a depth of 41m [1m Gravel + 10m Weathered Rock + 30m Rough stone] below ground level. The total Geological Resources are calculated by area method. The total geological resources are given table below:

TABLE - 2

| GEOLOGICAL RESOURCES |          |                               |                                  |                          |
|----------------------|----------|-------------------------------|----------------------------------|--------------------------|
| Area in Sq.m         | Depth in | Rough stone in m <sup>3</sup> | Weathered Rock in m <sup>3</sup> | Gravel in m <sup>3</sup> |
| 22840                | 1        | -                             | -                                | 22840                    |
|                      | 10       | -                             | 228400                           | -                        |
|                      | 30       | 685200                        | -                                | -                        |
| <b>Total</b>         |          | <b>685200</b>                 | <b>228400</b>                    | <b>22840</b>             |

The Geological Resources of Gravel : 22,840m<sup>3</sup>

The Geological Resources of Weathered Rock : 2,28,400m<sup>3</sup>

The Geological Resources of Rough Stone : 6,85,200m<sup>3</sup>

Geological Resources has been computed based on the physical investigation and filed survey data.

**Estimation of Mineable Reserves:**

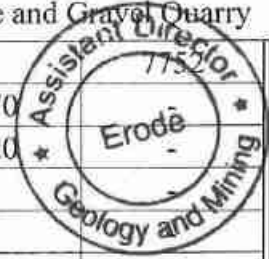
The applicant intends to apply and obtain permission from Director of Mines Safety, Chennai for working Common mine boundary with adjacent existing quarries situated on the Northern side of the lease area under Rule 111(1) of Metalliferous Mines Regulations, 1961. This relaxation will be applied and obtained after the execution of lease / Commencement of quarry operation. The mineral reserves locked up under safety distance and benches will be removed only after obtained permission and approval from the competent authority.

Hence, the mineable reserves are calculated as per proposed common mine boundary on the Northern side is requested by the applicant.

TABLE - 3

| MINEABLE RESERVE - AS PER PROPOSED COMMON MINE BOUNDARY ON THE NORTHERN SIDE |       |               |              |              |                                      |                                  |                          |
|--|-------|---------------|--------------|--------------|--------------------------------------|----------------------------------|--------------------------|
| Section  | Bench | Length in (m) | Width in (m) | Depth in (m) | Rough stone @ 100% (m <sup>3</sup> ) | Weathered Rock in m <sup>3</sup> | Gravel in m <sup>3</sup> |
| XY-AB  | i     | 90            | 87           | 1            | -                                    | -                                | 7830                     |
|  | ii    | 87            | 84           | 5            | -                                    | 36540                            | -                        |
|  | iii   | 80            | 74           | 5            | -                                    | 29600                            | -                        |
|  | iv    | 74            | 64           | 5            | 23680                                | -                                | -                        |
|  | v     | 67            | 54           | 5            | 18090                                | -                                | -                        |
|  | vi    | 61            | 44           | 5            | 13420                                | -                                | -                        |
|  | vii   | 55            | 34           | 5            | 9350                                 | -                                | -                        |
|  | viii  | 49            | 24           | 5            | 5880                                 | -                                | -                        |
|  | ix    | 38            | 14           | 5            | 2660                                 | -                                | -                        |
| <b>Total</b>   |       |               |              |              | <b>73080</b>                         | <b>66140</b>                     | <b>7830</b>              |

|                    |              |     |    |   |               |               |              |
|--------------------|--------------|-----|----|---|---------------|---------------|--------------|
| XY-CD              | i            | 204 | 38 | 1 | -             | -             |              |
|                    | ii           | 202 | 37 | 5 | -             | 37370         |              |
|                    | iii          | 197 | 32 | 5 | -             | 31520         |              |
|                    | iv           | 192 | 27 | 5 | 25920         | -             |              |
|                    | v            | 187 | 22 | 5 | 20570         | -             |              |
|                    | vi           | 182 | 17 | 5 | 15470         | -             | -            |
|                    | vii          | 177 | 12 | 5 | 10620         | -             | -            |
|                    | <b>Total</b> |     |    |   |               | <b>72580</b>  | <b>68890</b> |
| <b>Grand Total</b> |              |     |    |   | <b>145660</b> | <b>135030</b> | <b>15582</b> |



|   |   |                              |
|---|---|------------------------------|
| Total Mineable Reserves of Gravel                         | : | <b>15,582m<sup>3</sup></b>   |
| Total Mineable Reserves of Weathered Rock                 | : | <b>1,35,030m<sup>3</sup></b> |
| Total Mineable Recoverable Reserves of Rough stone @ 100% | : | <b>1,45,660m<sup>3</sup></b> |

The mineable reserves have been computed as **1,45,660m<sup>3</sup>** of Rough stone at the rate of 100% recovery, **1,35,030m<sup>3</sup>** of Weathered Rock and **15,582m<sup>3</sup>** of Gravel for a period of Ten years upto a depth of 41m below ground level.

## 5.0 MINING

### 5.1. Method of mining (opencast / underground):

Open cast Mechanized Mining is being carried out with 5.0 meter vertical bench with a bench width is not less than the bench height.

However, as far as the quarrying of Rough Stone is concerned, observance of the provisions of Regulation 106 (2) (b) is available with Director General of Mines Safety. If the Company intends to modify the dimensions of benches, relaxation and permission are available with Director of Mines Safety under Regulation 106 (2) (b) of Metalliferous Mines Regulations, 1961. In such a scenario if there is any drastic change in the Resources and Reserves a modified plan will be submitted to the concerned authority for necessary relaxation, clearance and permission. Also the applicant intends to apply and obtain permission from Director of Mines Safety, Chennai for working Common mine boundary with adjacent existing quarries situated on the northern side of the lease area under Regulation 111(3) of Metalliferous Mines Regulations, 1961.

**5.2. Mode of working (mechanized/ manual):**

The Rough Stone is proposed to quarry at 5m bench height & width with ~~conventional~~ Opencast Mechanized Method.

The quarry operation involves shallow jack hammer drilling, slurry explosives in blasting, excavation, Loading and transportation of Rough stone to the needy crusher.

The production of Rough stone in this quarry involves the following method which is typical for Rough Stone quarrying in contrast to other major mineral mining.

Splitting of rock mass of considerable volume from the parent rock mass by shallow jackhammer drilling and blasting, hydraulic excavators are used for loading the Rough Stone from pithead to the needy crushers.

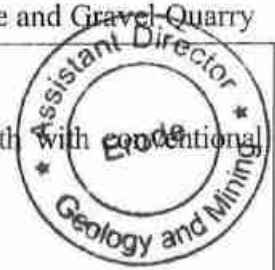
Occasionally hydraulic excavators are attached with rock breakers for fragmentation to avoid secondary blasting. The primary boulders thus splitted are removed from the pits by excavators and further made to smaller sizes by rock breakers attached in excavators. It is a conventional opencast mechanized method of mining.

**5.3. Proposed Bench Height and Width:**

The bench height is proposed 5.0 meter vertical bench the width of the bench is not less than the Height. After obtaining relaxation as per 106 2(b) of Metalliferous Mines Regulations, 1961 from the DMS, the realignment of benches will be carried out.

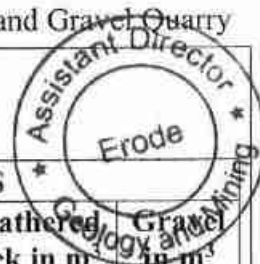
**5.4. Indicate the overburden / mineral production expected pit wise as detailed below (composite plan and section showing pit layout, dumps, disposal of waste if any etc.):**

The overburden in the form of Gravel, the Gravel will be directly loaded into Tippers for the filling and levelling of low-lying areas, this will be done only after obtaining permission and paying necessary seigniorage fee to the Government. The excavated rough stone will be directly loaded into Tippers to the needy customers. The Composite year wise Development and production plan and sections indicating the pit lay out and green belt development are shown in Plate Nos. III and III-A.



## Year wise Development and Production

TABLE - 5



## YEARWISE PRODUCTION FOR FIRST FIVE YEARS

| Year               | Section | Bench | Length<br>in (m) | Width<br>in (m) | Depth<br>in (m) | Rough stone<br>@ 100% (m <sup>3</sup> ) | Weathered<br>Rock in m <sup>3</sup> | Gravel<br>in m <sup>3</sup> |
|--------------------|---------|-------|------------------|-----------------|-----------------|---|-------------------------------------|-----------------------------|
| I                  | XY-AB   | i     | 60               | 87              | 1               | -                                       | -                                   | 5220                        |
|                    |         | ii    | 56               | 84              | 5               | -                                       | 23520                               | -                           |
|                    |         | iii   | 44               | 74              | 5               | -                                       | 16280                               | -                           |
|                    |         | iv    | 32               | 64              | 5               | 10240                                   | -                                   | -                           |
|                    |         | v     | 21               | 54              | 5               | 5670                                    | -                                   | -                           |
| <b>Total</b>       |         |       |                  |                 |                 | <b>15910</b>                            | <b>39800</b>                        | <b>5220</b>                 |
| II                 | XY-AB   | i     | 30               | 87              | 1               | -                                       | -                                   | 2610                        |
|                    |         | ii    | 31               | 84              | 5               | -                                       | 13020                               | -                           |
|                    |         | iii   | 36               | 74              | 5               | -                                       | 13320                               | -                           |
|                    |         | iv    | 28               | 64              | 5               | 8960                                    | -                                   | -                           |
|                    |         | v     | 28               | 54              | 5               | 7560                                    | -                                   | -                           |
|                    | XY-CD   | i     | 70               | 38              | 1               | -                                       | -                                   | 2660                        |
|                    |         | ii    | 68               | 37              | 5               | -                                       | 12580                               | -                           |
|                    |         | iii   | 63               | 32              | 5               | -                                       | 10080                               | -                           |
| <b>Total</b>       |         |       |                  |                 |                 | <b>16520</b>                            | <b>49000</b>                        | <b>5270</b>                 |
| III                | XY-AB   | iii   | 14               | 64              | 5               | 4480                                    | -                                   | -                           |
|                    |         | iv    | 18               | 54              | 5               | 4860                                    | -                                   | -                           |
|                    | XY-CD   | i     | 134              | 38              | 1               | -                                       | -                                   | 5092                        |
|                    |         | ii    | 134              | 37              | 5               | -                                       | 24790                               | -                           |
|                    |         | iii   | 134              | 32              | 5               | -                                       | 21440                               | -                           |
|                    |         | iv    | 25               | 27              | 5               | 3375                                    | -                                   | -                           |
|                    |         | v     | 20               | 22              | 5               | 2200                                    | -                                   | -                           |
| vi                 | 15      | 17    | 5                | 1275            | -               | -                                       |                                     |                             |
| <b>Total</b>       |         |       |                  |                 |                 | <b>16190</b>                            | <b>46230</b>                        | <b>5092</b>                 |
| IV                 | XY-AB   | vi    | 61               | 44              | 5               | 13420                                   | -                                   | -                           |
|                    |         | vii   | 20               | 34              | 5               | 3400                                    | -                                   | -                           |
| <b>Total</b>       |         |       |                  |                 |                 | <b>16820</b>                            | -                                   | -                           |
| V                  | XY-AB   | vii   | 35               | 34              | 5               | 5950                                    | -                                   | -                           |
|                    |         | viii  | 49               | 24              | 5               | 5880                                    | -                                   | -                           |
|                    |         | ix    | 38               | 14              | 5               | 2660                                    | -                                   | -                           |
|                    | XY-CD   | vii   | 10               | 12              | 5               | 600                                     | -                                   | -                           |
| <b>Total</b>       |         |       |                  |                 |                 | <b>15090</b>                            | -                                   | -                           |
| <b>Grand Total</b> |         |       |                  |                 |                 | <b>80530</b>                            | <b>135030</b>                       | <b>15582</b>                |

The Recoverable reserves have been computed as **80,530m<sup>3</sup>** of Rough stone at 100% recovery for first five years, **1,35,030m<sup>3</sup>** of Weathered Rock and **15,582m<sup>3</sup>** of Gravel for first three years upto a depth of 41m below from ground profile (Refer Plate No. III).

TABLE – 5A

| YEARWISE PRODUCTION FOR SECOND FIVE YEARS |         |              |               |              |              |                                      |
|---|---------|--------------|---------------|--------------|--------------|--------------------------------------|
| Year                                      | Section | Bench        | Length in (m) | Width in (m) | Depth in (m) | Rough stone @ 100% (m <sup>3</sup> ) |
| VI  | XY-CD   | iv           | 100           | 27           | 5            | 13500                                |
|   |         | <b>Total</b> |               |              |              |                                      |
| VII                                       | XY-CD   | iv           | 67            | 27           | 5            | 9045                                 |
|   |         | v            | 40            | 22           | 5            | 4400                                 |
|   |         | <b>Total</b> |               |              |              |                                      |
| VIII                                      | XY-CD   | v            | 127           | 22           | 5            | 13970                                |
|   |         | <b>Total</b> |               |              |              |                                      |
| IX  | XY-CD   | vi           | 158           | 17           | 5            | 13430                                |
|   |         | <b>Total</b> |               |              |              |                                      |
| X   | XY-CD   | vi           | 9             | 17           | 5            | 765                                  |
|   |         | vii          | 167           | 12           | 5            | 10020                                |
|   |         | <b>Total</b> |               |              |              |                                      |
| <b>Grand Total</b>                        |         |              |               |              |              | <b>65130</b>                         |

The year wise proposed production and depth of estimation of reserves and resources is estimated based upon the requirements to the applicant's proposed production schedule.

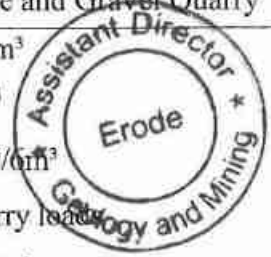
The Recoverable reserves have been computed as 65,130m<sup>3</sup> of Rough stone only at 100% recovery to a depth of upto 41m below from ground profile for remaining five years of the lease period (Refer Plate No. III-A). Total excavation will be proposed 1,45,660m<sup>3</sup> of Rough stone, 1,35,030m<sup>3</sup> of Weathered rock and 15,582m<sup>3</sup> of Gravel for the period of ten years. The peak production capacity in the quarry is 16,820m<sup>3</sup> of Rough stone on 4<sup>th</sup> year and the proposed production schedule is arrived as per lessee's requirement and the EIA and EMP will be prepared an annual peak production.

The applicant ensures the total quantity proposed in the benches will not exceed during the quarrying operation. Besides the rough stone locked up in benches will be exploited after obtaining necessary permission from the office of Director of Mine Safety, Chennai region by submitting relevant documents, appropriate safety plans and its Mitigation measures.

|  |   |                                       |
|--|---|---------------------------------------|
| One lorry load   | = | 6m <sup>3</sup> (approx.)             |
| Total No of Working days                                       | = | 300 Days per year                     |
| Total quantity to be removed during the ten years lease period | = | 1,45,660m <sup>3</sup>                |
| Peak production capacity during the 4 <sup>th</sup> year       | = | 16,820m <sup>3</sup>                  |
| Hence total Lorry loads per day                                | = | 16,820m <sup>3</sup> /6m <sup>3</sup> |
|  | = | 2803 Lorry loads                      |
|  | = | 2,803/300 days                        |
| Rough Stone (Maximum)  | = | 9 – 10 Lorry loads per day            |



|  |   |
|--|---|
| Total Weathered Rock to be removed during the first three years =    | 1,35,030m <sup>3</sup>                  |
| Peak production capacity during the 2 <sup>nd</sup> year             | = 49,000m <sup>3</sup>                  |
| Hence total Lorry loads per day                                      | = 49,000m <sup>3</sup> /6m <sup>3</sup> |
|  | = 8,167 Lorry loads                     |
|  | = 8,167/300 days                        |
| Gravel (Maximum)   | = <b>27 Lorry loads per day</b>         |
| Total Gravel to be removed during the first three years              | = 15,582m <sup>3</sup>                  |
| Peak production capacity during the 2 <sup>nd</sup> year             | = 5,270m <sup>3</sup>                   |
| Hence total Lorry loads per day                                      | = 5,270m <sup>3</sup> /6m <sup>3</sup>  |
|  | = 878 Lorry loads                       |
|  | = 878/300 days                          |
| Gravel (Maximum)   | = <b>3 -4 Lorry loads per day</b>       |
| Working hours = 9.00 am to 6.00 pm (with 1.00-2.00 P.M. lunch break) |   |



### 5.5. Machineries to be used:

#### For Mining:

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

TABLE - 6

#### I. DRILLING MACHINE:

| S. No. | Type        | Nos | Dia Hole mm | Size Capacity | Motive power   |
|--------|-------------|-----|-------------|---------------|----------------|
| 1      | Jack-Hammer | 4   | 32          | 1.2m to 2.0m  | Compressed air |
| 2      | Compressor  | 1   | -           | 400 psi       | Diesel Drive   |

#### II. EXCAVATION & LOADING EQUIPMENT:

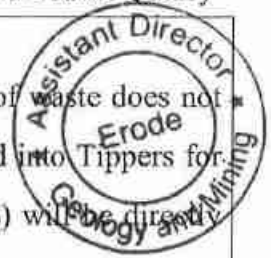
| S. No. | Type                                   | Nos | Capacity | Motive Power |
|--------|--|-----|----------|--------------|
| 1      | Excavator with Bucket and Rock Breaker | 1   | 300      | Diesel Drive |

#### III. HAULAGE WITHIN THE MINE & TRANSPORT EQUIPMENT:

| S. No. | Type            | Nos | Capacity  | Motive Power |
|--------|-----------------|-----|-----------|--------------|
| 1      | Tippers         | 3   | 20 tonnes | Diesel Drive |
| 2      | Water Sprinkler | 1   | 4000 ltrs | Diesel Drive |

**5.6. Disposal of Overburden/Waste:**

There is no Waste anticipated during this plan period hence, disposal of waste does not arise. The overburden in the form of Gravel, the Gravel will be directly loaded into Tippers for the filling and levelling of low-lying areas. The excavated rough stone (100%) will be directly loaded into Tippers to the needy customers.

**5.7. Use of the Mineral:**

The excavated rough stone (100%) will be directly loaded into Tippers as raw form to the needy nearby crushing unit to making Road metals and construction materials.

**5.8. Brief note on conceptual mining plan for the entire lease period base on the geological, mining and environmental considerations:**

Conceptual mining plan is prepared with an object of long-term systematic development of benches, layouts, selection of permanent structures, depth of quarrying and ultimate pit dimensions, 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.,

As the applicant has applied quarry lease for Ten years, the ultimate pit limit (dimension) at the end of this mining plan period is given below:

TABLE - 7

| Length (m) (Max.) | Width (m) (Avg.) | Depth (m) (Max.)       |
|-------------------|------------------|------------------------|
| 294               | 87               | 41m below ground level |

All the base line information studies like Air quality monitoring, Noise and vibration monitoring, Water analysis studies will be carried out every year as per the MoEF & CC Norms. Please refer Plate Nos. III & IV. As per the NGT orders the applicant is directed to plant 500 trees per hectares along the quarry site and in the haul road either at the regular or the phased manner by planting native species.

There is no waste anticipated during the entire life of quarry. Hence, backfilling is not proposed in this Rough stone quarry. After completion of quarry operation the quarried out pit will be allowed to collect the seepage and rainwater and the water storage will be kept as temporary reservoir for charging the nearby wells and the water will be utilized for Green belt development purpose. The quarry area will be fenced with barbed wire fencing also safety bund constructed around the quarry to prevent inadvertent entry of public and cattle (Refer Plate No. IV and V).



## 6.0 BLASTING

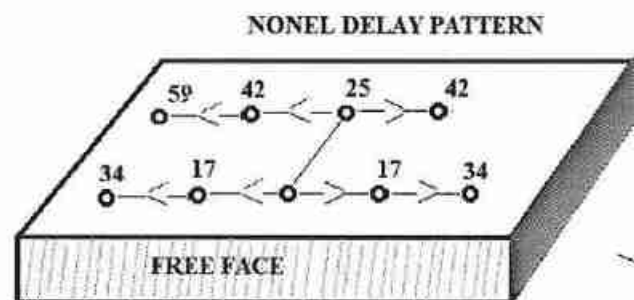
### 6.1 Blasting pattern:

The quarrying operation is proposed to be carried out by Mechanized Opencast Method in conjunction with conventional method of mining using shallow Jack hammer drilling and mild blasting with NONEL initiation of shattering effect for loosening the Rough stone. Nonel initiation provides a reasonably good solution to the fly rock problem. The main objectives of Nonel Blasting are to reduce the ground vibration, noise, flyrocks generated due to blasting operations. The overall cost of blasting in NONEL is very less compared to electrical blasting and hence it optimizes the cost of blasting.

Drilling and blasting parameters are as follows:

|                         |   |                       |
|-------------------------|---|-----------------------|
| Depth of Each hole      | : | 1.6m                  |
| Spacing between holes   | : | 1.2m                  |
| Burden for hole         | : | 1.0m                  |
| Diameter of hole        | : | 32mm                  |
| Pattern of hole         | : | Staggered pattern     |
| Inclination of holes    | : | 80° from horizontal   |
| Use of delay detonators | : | NONEL                 |
| Hole to Hole            | : | 17 milli second delay |
| Row to Row              | : | 25 milli second delay |

### BLASTING PATTERN DRAWING



|   |   |                 |
|---|---|-----------------|
| <b>Spacing</b>  | = | <b>1.2m</b>     |
| <b>Burden</b>   | = | <b>1.0m</b>     |
| <b>Depth of the hole</b>                              | = | <b>1.6m</b>     |
| <b>No of holes proposed per day (Peak Production)</b> | = | <b>48 Holes</b> |

### 6.2 Type of explosives to be used:

Small Dia. 25mm Slurry explosives are proposed to be used for shattering and heaving effect for removal and winning of Rough stone. No deep hole drilling or secondary blasting is proposed. NONEL blasting and muffle blasting may be adopted after permission from DGMS.

**6.3 Measures proposed to minimize ground vibration due to blasting:**

The quarry is situated more than 300m away from the nearby villages, Controlled blasting measures of NONEL initiation is being adopt for minimizing ground vibration and fly rock.

Shallow depths jackhammer drilling & blasting is proposed to be carried out with minimum use of explosive mainly to give heaving effect in rough stone for easy excavation and to control fly rock.

**NONEL Delay detonators:**

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

The major advantages of delay blasting are:

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

**Blasting program for the production per day (As per Peak production capacity):**

|  |  |
|--|--|
| Peak production (4 <sup>th</sup> Year) | = 16,820m <sup>3</sup> x 2.6(Bulk Density) = 43,732 Tons |
| No of Holes                            | = 48 Holes   |
| Yield                                  | = 144 Tons   |
| Powder factor                          | = 6 Tons/Kg of explosives                                |
| Total explosive required               | = 24 Kg-Slurry explosives                                |
| Charge/ hole                           | = 0.5 Kg   |
| Blasting at day time only              | = 1.00 – 1.30 P.M. (whenever required)                   |

**Anticipated theoretical calculation of PPV**

The empirical equation for assessment of peak particle velocity (PPV) is:

$$V = K [R/Q^{0.5}]^{-B}$$

Where –

V = peak particle velocity (mm/s)

K = site and rock factor constant

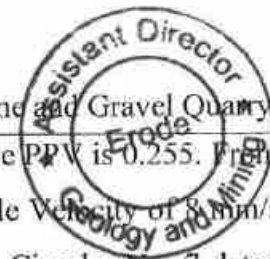
Q = maximum instantaneous charge (kg)

B = constant related to the rock and site (usually 1.6)

R = distance from charge (m)

**Table – 8 - PREDICTED PPV VALUES DUE TO BLASTING**

| Maximum Charge per day (kg) | Number of Round Blast per day | Number of holes blasted per round | Number of holes blasted per day | Nearest Infrastructure (m) | PPV (mm/s) |
|-----------------------------|-------------------------------|-----------------------------------|---------------------------------|----------------------------|------------|
| 24                          | 1                             | 48                                | 48                              | 560                        | 0.255      |



If the blasting would be carried out by 48 holes in a single round the PPV is 0.255. From the above table, the charge per blast of 24kg is well below the Peak Particle Velocity of 8 mm/s as per Directorate General of Mines Safety for safe level criteria through Circular No. 7 dated 29/8/1997. Anyhow, the applicant ensures that carry out the **blasting thrice a day** under the supervision of competent qualified statutory personnel employed. However, as per statutory requirement control measures will be adopted to avoid the impacts due to ground vibrations and fly rocks due to blasting.

#### 6.4 Storage and safety measures to be taken while blasting:

The applicant will engage authorized explosive agency to carry out the small amount of blasting and it will be supervised by competent and statutory foreman/Permit Mines Manager. The explosives agencies should be having the valid Blaster certificate. He will blast holes in the quarry site. After the completion of Blasting the explosives Agencies will take it out back the remaining quantity of Explosives. The Competent Qualified Statutory personnel appointed by the applicant will maintain the records of Explosives as per the Indian Explosives Act.

### 7.0 MINE DRAINAGE

#### 7.1 Depth of water table (based on nearby wells and water bodies):

The area is a plain topography; since the lease applied area consists the most common type of dendritic drainage pattern. The water table in the area is about 68m – 73m which is observed from the existing private boreholes. The lease area is fully covered by Massive Charnockite formation. The quarry operation confined to well above the water table hence, the Ground Water problem will not arise. If water seepage may occur due to the fracture, the same will be used for Greenbelt. Anyhow, Garland drain will be constructed all along the boundary to prevent surface run-off water entering into the quarry.

TABLE – 9

| Type      | Distance & Direction | Location                       |
|-----------|----------------------|--------------------------------|
| Bore Well | 900m East side       | 11°25'56.73"N<br>77°10'45.56"E |

#### 7.2 Arrangements and places where the mine water is finally proposed to be discharged:

The quarry operations are confined to well above the water table during the entire lease period. If water is encountered at quarry due to rain water and seepage, the same will be pumped out by 5HP water pump and discharge to the Green belt development areas. Besides, the water will also be used for dust suppression on haul roads during Haulage of machineries.

**8.0 OTHER PERMANENT STRUCTURES (also shown in the map)****TABLE - 10**

| S.No.     | Description   | Particulars  | Aerial Distance<br>Direction |                |                 |       |                    |                         |      |            |      |       |            |      |      |                    |                         |  |
|-----------|---|--|------------------------------|----------------|-----------------|-------|--------------------|-------------------------|------|------------|------|-------|------------|------|------|--------------------|-------------------------|--|
| 1         | Nearest National Highway  | (NH-948) Sathyamangalam – Coimbatore   | 2.6km – SE                   |                |                 |       |                    |                         |      |            |      |       |            |      |      |                    |                         |  |
| 2         | State Highways  | (SH-15) Sathyamangalam – Mettupalayam  | 2.7km – NW                   |                |                 |       |                    |                         |      |            |      |       |            |      |      |                    |                         |  |
| 3         | Railway station   | Mettupalayam Railway station   | 29 km – SW                   |                |                 |       |                    |                         |      |            |      |       |            |      |      |                    |                         |  |
| 4         | Airport   | Erode  | 46.5 km – SW                 |                |                 |       |                    |                         |      |            |      |       |            |      |      |                    |                         |  |
| 5         | Nearest Habitation  | 560m – SW  |                              |                |                 |       |                    |                         |      |            |      |       |            |      |      |                    |                         |  |
| 6         | Town  | Sathyamangalam   | 11km – NE                    |                |                 |       |                    |                         |      |            |      |       |            |      |      |                    |                         |  |
| 7         | Nearest Government School   | Panayampalli – Higher Secondary School   | 4.4km – SW                   |                |                 |       |                    |                         |      |            |      |       |            |      |      |                    |                         |  |
| 8         | Government Hospital   | Sathyamangalam   | 11km – NE                    |                |                 |       |                    |                         |      |            |      |       |            |      |      |                    |                         |  |
| 9         | Reserved Forest   | Velamundi Reserve forest is situated on Northeastern side of the lease applied area, Hence 60m safety distance has been maintained.  |                              |                |                 |       |                    |                         |      |            |      |       |            |      |      |                    |                         |  |
| 10        | Defense Installation/Historical Monuments/ Archaeological           | Nil within 500m radius.  |                              |                |                 |       |                    |                         |      |            |      |       |            |      |      |                    |                         |  |
| 11        | Nearby Water Bodies   | Odai – 660m – NW.  |                              |                |                 |       |                    |                         |      |            |      |       |            |      |      |                    |                         |  |
| 12        | Interstate Boundary   | Around 32.6km – West (Karnataka State Boundary).   |                              |                |                 |       |                    |                         |      |            |      |       |            |      |      |                    |                         |  |
| 13        | Critically Polluted areas identified by the CPCB                    | Around 58km – SW (Coimbatore – SIDCO).   |                              |                |                 |       |                    |                         |      |            |      |       |            |      |      |                    |                         |  |
| 14        | Protected areas Notified under wildlife (Protection) Act,1972       | Around 8.77 km – Northwest (Sathyamangalam Tiger Reserve).<br>Around 7.77 km – Northwest (Sathyamangalam Tiger Reserve – Eco Sensitive Zone).  |                              |                |                 |       |                    |                         |      |            |      |       |            |      |      |                    |                         |  |
| 15        | Applicability of CRZ, Notification 2011 as amended.                 | Not Applicable.  |                              |                |                 |       |                    |                         |      |            |      |       |            |      |      |                    |                         |  |
| 16        | Applicability of Hill Area Conservation Authority (HACA) Clearance. | Not Applicable.  |                              |                |                 |       |                    |                         |      |            |      |       |            |      |      |                    |                         |  |
| 17        | Housing area, EB line (HT & LT Line)                                | There is no EB (LT/HT) line or Housing area situated within 50m radius.  |                              |                |                 |       |                    |                         |      |            |      |       |            |      |      |                    |                         |  |
| 18        | Boundaries of the permitted area.                                   | The boundaries of the permitted areas are as follows (Refer Plate No. II):<br>North - S.F.Nos. 151 (Part) and 152/3<br>East - S.F.No. 154.<br>South - S.F.Nos. 148, 149 and 150<br>West - S.F.Nos. 140 and Reserve Forest.   |                              |                |                 |       |                    |                         |      |            |      |       |            |      |      |                    |                         |  |
| 19        | Adjacent Patta lands / Govt. Land                                   | <table border="1"> <thead> <tr> <th>Direction</th> <th>Classification</th> <th>Safety Distance</th> </tr> </thead> <tbody> <tr> <td>North</td> <td>Patta land / R.F.,</td> <td>7.5m and 60m to the R.F</td> </tr> <tr> <td>East</td> <td>Patta land</td> <td>7.5m</td> </tr> <tr> <td>South</td> <td>Patta land</td> <td>7.5m</td> </tr> <tr> <td>West</td> <td>Patta land / R.F.,</td> <td>7.5m and 60m to the R.F</td> </tr> </tbody> </table> | Direction                    | Classification | Safety Distance | North | Patta land / R.F., | 7.5m and 60m to the R.F | East | Patta land | 7.5m | South | Patta land | 7.5m | West | Patta land / R.F., | 7.5m and 60m to the R.F |  |
| Direction | Classification  | Safety Distance  |                              |                |                 |       |                    |                         |      |            |      |       |            |      |      |                    |                         |  |
| North     | Patta land / R.F.,  | 7.5m and 60m to the R.F  |                              |                |                 |       |                    |                         |      |            |      |       |            |      |      |                    |                         |  |
| East      | Patta land  | 7.5m   |                              |                |                 |       |                    |                         |      |            |      |       |            |      |      |                    |                         |  |
| South     | Patta land  | 7.5m   |                              |                |                 |       |                    |                         |      |            |      |       |            |      |      |                    |                         |  |
| West      | Patta land / R.F.,  | 7.5m and 60m to the R.F  |                              |                |                 |       |                    |                         |      |            |      |       |            |      |      |                    |                         |  |

(Refer Plate No. II):

## STRUCTURE WITHIN 0 -100m

Number of Structures - 1 No.

TABLE - 11

| Number of Structure | Type of Structure | Usage Purpose   | Commercial / industry/ residential/ farm house/ Govt. building | Occupants of Building/ Structure | Remarks     |
|---------------------|-------------------|-----------------|--|----------------------------------|-------------|
| 1                   | Thar plant        | To Road project | Non residential  | Nil                              | No resident |

## STRUCTURE WITHIN 100 -200m

Number of Structures - Nil.

Nil

## STRUCTURE WITHIN 200 -300m

Number of Structures - Nil.

Nil

## 9.0 EMPLOYMENT POTENTIAL &amp; WELFARE MEASURES

## 9.1 Employment potential (skilled, semi-skilled, un skilled):

TABLE - 12

| Designation                    | Present Employment position | Employees Requirement | Total     |
|--------------------------------|-----------------------------|-----------------------|-----------|
| <b>a) Supervisory category</b> |                             |                       |           |
| Geologist                      | -                           | 1                     | 1         |
| <b>b) Skilled labour</b>       |                             |                       |           |
| Mine Foreman                   | -                           | 1                     | 1         |
| Blaster/Mate                   | -                           | 1                     | 1         |
| Excavator - Operator           | -                           | 1                     | 1         |
| Tipper Driver                  | -                           | 3                     | 3         |
| Water sprinkler Driver         | -                           | 1                     | 1         |
| Jack-Hammer Drillers           | -                           | 8                     | 8         |
| <b>c) Unskilled</b>            |                             |                       |           |
| Security                       | -                           | 2                     | 2         |
| Labour & Helper                | -                           | 4                     | 4         |
| Co-operator and Cleaner        | -                           | 5                     | 5         |
| <b>Total</b>                   | -                           | <b>27</b>             | <b>27</b> |

The proposed output per man shift:

TABLE - 13

|   |   |
|---|---|
| Average ROM Production expected per annum (1,45,660m <sup>3</sup> / 10 years) | 14,566m <sup>3</sup>                      |
| No. of days likely to be worked   | 300 days                                  |
| Average ROM production per day  | 49m <sup>3</sup>                          |
| OMS = Average Production per day / Average employment per day                 | 49m <sup>3</sup> / 27 = 1.7m <sup>3</sup> |

The above manpower is adequate to meet out the production schedule and the machinery strength envisaged in the mining plan and to comply with the statutory provisions of the Mines Safety Regulations. It is been ensured that the labour will not be employed less than 18 years, **No child labour** will engaged or entertained for any kind of quarrying operations. All the labours engaged for quarrying operations will be insured during the quarry lease period.

**9.2 Welfare Measures:****a) Drinking Water:**

Packaged drinking water is available from the nearby water vendors in Pugalampatti which is located about 8.5km on the Southern side of the lease applied area.

**b) Sanitary Facilities:**

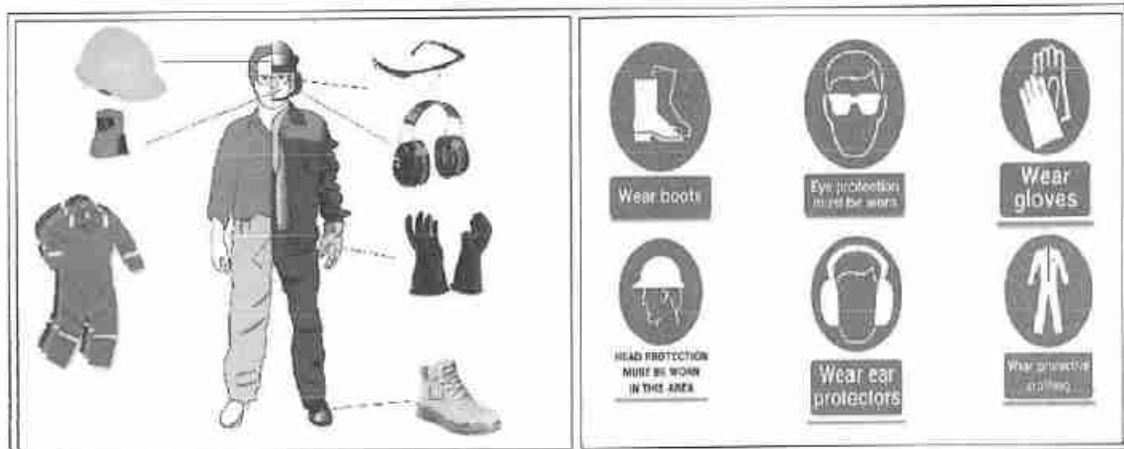
Hygienic modern Sanitary Facilities will be constructed in the safety area as semi-permanent structure and it will be maintained periodically.

**c) First aid facility:**

First aid kits are kept in Mines office room, in case of such eventuality is the victim will be given first aid immediately at the site by the competent and statutory foreman/permit manager/mate will be in charge of first aid and injured person will be taken to the hospital by the applicant's vehicle. Hospital is available in Sathyamangalam located at a distance of 9km on the Northeast side.

**d) Labour Health:**

Periodically medical check-up related to occupational health safety will be conducted to all the workers in applicant own cost.

**e) Precautionary safety measures to the labourers:**


- Helmets,
- Reflector Jackets
- Dust mask
- Mine Goggles,
- Ear plugs,
- Ear muffs
- Safety Shoes

All personnel protective equipment as per the DGMS standard will be provided as per the specification approved by Director of mines safety. Periodically medical check-up will be conducted for all workers for any mine health related problems. Proper training and vocational education will be given by qualified and experienced safety officer to all the employees about the safety and systematic Rough stone quarrying operations. The drillers and workers will be sent for vocational training periodically, to carry out the quarrying operations scientifically and to safe guard the men and machinery and to create awareness about conventional opencast quarrying operations.



**PART – B****10.0 ENVIRONMENT MANAGEMENT PLAN**

The EMP is prepared based on the Mines act, Rules & amendment from by state & central government. If the SEIAA/SEAC instructed the modification and alter the EMP the outcome of their recon would be final and the applicant is instructed to followed the EIA / EMP for its compliance as per the CPCB / TNPCB Norms.

| <b>Environment</b>   | <b>Anticipated impact</b>  | <b>Mitigation measure</b>  |
|--|--|--|
| <b>Land Environment</b>  | <p>i. Topography of the area will change due to mining activity. Around 1.62.48 Ha. area will be proposed to quarry operation.</p> | <p>i. No waste will be anticipated during entire life of quarry. Hence, backfilling is not proposed in this quarry operation. Anyhow, barbed wire fencing and safety bund will be constructed around the quarry to prevent inadvertent entry of public and cattle.</p> <p>ii. The excavated benches shall be developed for plantation with grasses, herbs and shrubs of local species to improve aesthetic of the area and to prevent any soil erosion and landslide.</p> <p>iii. Mining benches will not exceed beyond the approved height and width.</p> <p>iv. Leftover foreign material like polythene bag, jute bag and useless articles will not be allowed to litter and no ill managed dumping will be used for filling the excavated pits</p> |
| ii. Soil quality and it's fertility of adjacent lands will affected due to fugitive dust and Vehicular emissions during drilling, blasting, loading, unloading and haulage of men and machineries. | This is discussed in following Air Environment due to avoid repetition.  |   |

|                          |   |   |
|--------------------------|---|---|
| <b>Water Environment</b> | <p>Surface Mining can have direct impact on physico-chemical characteristics of the local drainage and groundwater resources. The detrimental effects, if any, to water resources resulting from surface mining are caused by following:</p> <ol style="list-style-type: none"> <li>Alteration of natural drainage pattern resulting from modification of topography.</li> <li>Abnormal increase in the turbidity of the nearby stream.</li> <li>Damage to riparian vegetation and River habitat.</li> <li>The activities can also disrupt the ecological diversity in many ways.</li> <li>Contamination of groundwater if mining intersects with the water table.</li> </ol> | <ol style="list-style-type: none"> <li>Construction of Garland drain with check dam and settling tank will be constructed around the quarry to collect the surface run off rain water and which will be discharge in to the natural drainage system and water bodies in manure as prescribed by TNPCB standards.</li> <li>Further mining will be completely stopped during the monsoon for free flow of surface run off and allowing natural recharge of groundwater.</li> <li>No wastewater shall be generated from the quarry activity. Proper drainage will be Maintained to eliminate inundation of working pits during rains from run-off water.</li> <li>The mine pit water collected due to rain will be utilized for water spraying on the haul Roads and watering for plantations.</li> <li>Septic tanks and soak pits will be provided for the disposal of domestic/ washroom effluents.</li> <li>The deposit will be worked from the top surface up to a depth of 41m below ground level and shall not in any case intersect and contaminate the ground water as the depth of the water table in the area is 68m – 73m.</li> </ol> |
| <b>Air Environment</b>   | <p>In surface mining operations, the source of air pollution may cause deterioration of air quality due to the fugitive dust emissions from drilling/blasting, scooping, loading-unloading operation of extracted mineral and its transportation. Drilling/blasting and loading of quarry material would be associated with the fugitive dust emission in the active area whereas fugitive emission during transportation would affect the areas/villages situated adjacent to the road side. Another source of air pollution would be</p>  | <ol style="list-style-type: none"> <li>Green belt will be developed in the safety zone with thick long leaves plant to arrest the fugitive dust and vehicular emissions on the surrounding environments.</li> <li>Wet drilling with dust extractor unit will be carried out to minimize the dust generation.</li> <li>Controlled blasting with Proper blasting pattern will be followed for effective rock fragmentation and generation of minimal fine dust to the atmosphere.</li> <li>Quarry material will be handled under wet condition during loading and unloading to minimize the dust generation of proposition, besides to avoid dust generation during transportation. Regular water sprinkling to the haul road to arrest the dust generation.</li> </ol>   |



|                                   |  |   |
|-----------------------------------|--|---|
|                                   | emission from the drilling machinery and excavators/tippers vehicles to be used for loading.   | <p>vi. Provision of dust filters/ mask to workers working at dust prone and affected areas.</p> <p>vii. Vehicular emission as a result of combustion of diesel generates small particulate matter (PM<sub>10</sub> &amp; PM<sub>2.5</sub>), Nitrogen oxides and Sulphur dioxide (NO<sub>2</sub> &amp; SO<sub>2</sub>). High quality diesel will be used in the motor vehicles to control these pollutants.</p> <p>viii. PUC (Pollution under control) certified vehicles will be used for transportation.</p> <p>ix. CPCB Prescribed emission standards for the vehicles would be followed.</p> <p>x. All vehicles and their exhausts would be well maintained and regularly tested for pollutant concentrations.</p>   |
| <p><b>Noise and Vibration</b></p> | <p>In the present mining activity for building material, noise will be generated from drilling machinery, blasting and vehicular movement. Noise level in the working environment is compared with the standards prescribed by Central Pollution Control Board as adopted and enforced by the Govt. of India through Noise Pollution (Regulation and Control) Rules, 2000.</p> | <p>i. Selection of new low – noise equipments for the quarry operation.</p> <p>ii. The noise levels shall be maintained within the permissible levels by involving all the noise regulating measures in vehicles and drilling/blasting operations.</p> <p>iii. To ensure minimum vibrations and noise due to blasting, Non-electric delay detonators in continuous sequence is proposed.</p> <p>iv. <b>Personnel Protective Equipment (PPE) like earmuffs and earplugs</b> shall be provided to the employees whose in critical operation like drilling, blasting and excavation as occupational safety measures.</p> <p>v. Proper maintenance done with regular interval by the Oiling and greasing for the machineries and vehicles to control the Source of noise during operation and transportation.</p> <p>vi. Regular and proper maintenance of machinery and transportation vehicles shall be ensured.</p> <p>vii. Transporting vehicles are enforcing the speed limits of 20km/hour within quarry area and not exceed 40km per hour from quarry to destination to reduce noise and vibration level.</p> <p>viii. There would be restrictions on mining activity and vehicular movement during night hours.</p> |

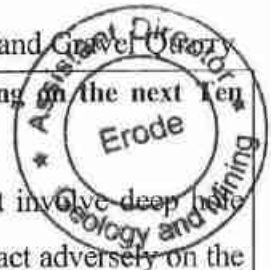


|                                      |  |   |
|--------------------------------------|--|---|
| <p><b>Biological Environment</b></p> | <p>The area having main floras are Neem, Palm, Cocos nucifera, Palm, Senna auriculata, Calotropis, Casuarina, Teak, Acacia nilotica, Thorney bushes and shrubs. No plants of botanical interest or animals of zoological interest recorded within 500m radius. The anticipated impacts on biological environment as follows:</p> <ol style="list-style-type: none"> <li>Diversity of living insects in the overburden material.</li> <li>Natural habitats of the existing faunas and its breeding will change due to the noise and vibration during operation.</li> <li>Mining may drive away the nearby residents from their habitat.</li> <li>Access roads crossing the riparian areas will have impact on the species disturbing the ecosystem.</li> <li>Diminution of the quality and quantity of habitat essential for aquatic and riparian species</li> <li>Deposition of dust on the plant and crop leaves is affecting the photosynthesis, Pollination, ratio of growth and reduction in the yield of agriculture.</li> <li>Excessive and unscientific surface mining results in the destruction of aquatic and riparian habitat through large changes in the channel morphology.</li> </ol> | <ol style="list-style-type: none"> <li>The natural habitats of the existing flora and fauna will not be disturbed.</li> <li>No mining will be carried out during the monsoon season to minimize impact on aquatic life which is mainly breeding season for many species.</li> <li>Fruit bearing trees will be planted to survive of the existing native faunas.</li> <li>No clearance of vegetation will be done during the entire mining operations.</li> <li>Water sprinkling on haul roads would be reduces the dust emission, thus avoiding damage to the crops and plants.</li> <li>No night hour mining will be carried out which may catch the attention of wildlife.</li> </ol> |
|--------------------------------------|--|---|



|  |  |
|--|--|
| <p><b>Socio Economic Environment</b></p> | <p>Any activity during mining will have adverse impact on Environment, careful mitigation measures are proposed to balance the impact on the existing environment and the applicant is always instructed to carry out safe, sustainable, eco-friendly mining operations at all times. The following positive impact on the society due to this mining activity.</p> <ol style="list-style-type: none"> <li>i. It is proposed to provide employment to about 27 persons for carrying out mining operations and give preference to the local people in providing employment. In addition, there will be opportunity for indirect employment to many people in the form of contractual jobs, business opportunities, service facilities etc. the economic status of the local people will be enhanced due to mining project.</li> <li>ii. 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.</li> <li>iii. Improvement of Physical structure like 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.</li> <li>iv. The continuation of opportunity for the employments, the nearby villages, living peoples and their life style would be improved.</li> <li>v. The applicant is advised to invest the CER cost (@ 2% from the total Project Cost) to develop the local Panchayat.</li> </ol> <p style="text-align: right;">Does not arise.</p> |
|--|--|





**10.1 Environmental impact assessment statement describing impact of mining on the next ten years:**

In the mining plan proposed for a production of Rough stone does not involve deep drilling and blasting. Such limited mining activity is not likely to cause any impact adversely on the environment. As far as pollution of air, water and noise concerned, the environmental impact studies will be conducted as per EIA notification issued by MoEF& CC. It is B Category mine. The compliance monitoring will be carried out for every six months as prescribed by the MOEF&CC and with state concerned authorities.

**10.2 Proposal for waste management:**

There is no waste anticipated in this Rough stone and Gravel quarrying operation. The entire quarried out materials will be utilized (100%). The maintenance of machineries & fuelling will be carried out as per the TNPCB Norms and the waste will be disposed in the Norms.

**10.3 Proposal for reclamation of land affected during mining activities and at the end of mining (refilling / fencing etc.):**

In the mining plan only to a maximum depth of 41m below ground level has been envisaged as workable depth for safe & economic quarrying operation during entire life of quarry. There is no waste generated hence, backfilling is not possible. After completion of quarry operation the quarried out pit will be allowed to collect the seepage and rainwater and the water storage will be kept as temporary reservoir for charging the nearby wells and the water will be utilized for Green belt development purpose. The quarry area will be fenced with Barbed wire fencing also safety bund constructed around the quarry to prevent inadvertent entry of public and cattle.

**10.4 Programme of Greenbelt development (indicate extend, number, name of species to be afforested):**

The safety zone along the boundary barrier has been identified to be utilized for Greenbelt development. Around 5,965m<sup>2</sup> area will be utilized for green belt development by planting 650 numbers along the safety zone during entire lease period also around 200 tree saplings in the approach road at first year of the plan period and 350 tree saplings from third year onwards in quarried out top benches with 2m height tree saplings with an anticipated survival rate of 80% with maintain atleast 1200 plants during the entire life of the quarry.

As per the SEIAA Recommendation the plantation will be carried out based on the output Environmental Clearance and the recommended species will be carried out for green belt development. Appropriate species of trees will be planted in a phased manner as described below.

TABLE – 14

| Year | No. of trees proposed to be planted | Area to be covered (m <sup>2</sup> ) | Name of the species   | Survival % | No. of trees expected to be grown |
|------|-------------------------------------|--------------------------------------|---|------------|-----------------------------------|
| I    | 80                                  | 718                                  | Necm, Pongamia Pinnata, Cordia dichotoma, Mango, Thespesia populnea, Mantharai, etc., | 80%        | 64                                |
| II   | 80                                  | 718                                  |   | 80%        | 64                                |
| III  | 80                                  | 719                                  |   | 80%        | 64                                |
| IV   | 80                                  | 719                                  |   | 80%        | 64                                |
| V    | 80                                  | 719                                  |   | 80%        | 64                                |
| VI   | 50                                  | 474                                  |   | 80%        | 40                                |
| VII  | 50                                  | 474                                  |   | 80%        | 40                                |
| VIII | 50                                  | 474                                  |   | 80%        | 40                                |
| IX   | 50                                  | 475                                  |   | 80%        | 40                                |
| X    | 50                                  | 475                                  |   | 80%        | 40                                |



### 10.5 Proposed financial estimate / budget for (EMP) environment management:

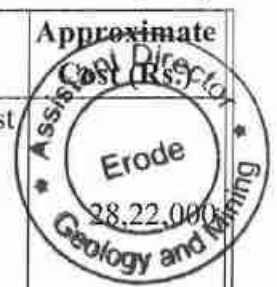
Budget Provision for the Mining Plan period:

TABLE – 15

| S. No                       | Monitory and Analysis Description | Rate per location | No. of location | Total Charges/ six months | Total Charges/ year |
|-----------------------------|-----------------------------------|-------------------|-----------------|---------------------------|---------------------|
| 1                           | Ambient air quality monitoring    | 6500              | 4               | 26000                     | 52000               |
| 2                           | Noise level monitoring            | 250               | 4               | 1000                      | 2000                |
| 3                           | Ground vibration monitoring       | 1000              | 2               | 2000                      | 4000                |
| 4                           | Water sampling and analysis       | 9000              | 1               | 9000                      | 18000               |
| <b>Total EMP Cost/ year</b> |                                   |                   |                 |                           | <b>76,000</b>       |

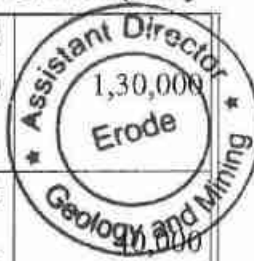
The EMP cost would be around Rs. 7,60,000/- for the period of Ten years.

| <b>A. Operational Cost / Project Cost / Investment:</b> |   | <b>Approximate Cost (Rs.)</b> |
|---|---|-------------------------------|
| i) Land cost  | The Land value as per the Government Guideline land cost is about,<br>2.28.40Ha x Rs. 12,35,500/Ha. = Rs.28,21,882/-<br>Round of Rs.28,22,000/-<br>(Source: <a href="https://tnreginet.gov.in/portal/">https://tnreginet.gov.in/portal/</a> ) | 28,22,000                     |
| ii) Machinery cost                                      | The following machineries are proposed to meet out the productions. Excavator attached with rock breaker, Tippers, Tractor mounted compressor with Jack hammer and loose tools (Rental Basis).  | 15,00,000                     |
| iii) Blasting Cost                                      | Explosives, Detonator, etc., (Rs. 6 per ton) (3,78,716 Tons x Rs. 6)  | 22,73,000                     |
| iv) Refilling/ Fencing                                  | Fencing will be constructed around the quarry pit to prevent the inadvertent entry of public and cattle cost would be around (Total Peripheral length 610m x Rs. 300/meter)   | 1,83,000                      |
| v) Labourers shed                                       | Labour shed will be constructed as semi-permanent structure. The cost is around   | 5,00,000                      |
| vi) Sanitary facility                                   | Adequate latrine and urinal accommodation has provided at conveniently accessible places the cost would be around   | 80,000                        |
| vii) Others items                                       | First aid room & accessories  | 50,000                        |
| viii) Drinking water facility for the labourers         | Packaged drinking water will be provided for all the Labours. Drinking water will be readily available at conveniently accessible points during the whole of the working shift the cost would be around.                                      | 1,00,000                      |
| ix) Sanitary arrangement                                | The latrine and urinal will keep clean and sanitary condition. The maintenance cost would be around.  | 60,000                        |
| x) Safety kit   | All the Safety kit such as Helmet, Earmuffs, Goggles, Reflector Jackets, Safety shoes etc., will be provided to the workers by the applicant own cost which would be around.  | 50,000                        |
| xi) Water sprinkling                                    | Water will be sprinkled in the haul roads by water sprinkler. The cost would be around.   | 4,00,000                      |
| xii) Garland drain                                      | Construction of Garland drain with check dam to prevent surface run-off rain water entering to the quarry pit, the construction cost is around (Total Peripheral length 540m x Rs. 300/meter).  | 1,62,000                      |

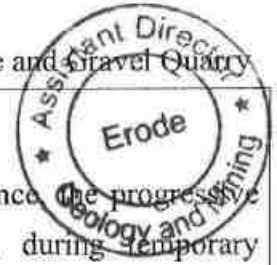




|                      |   |                  |
|----------------------|---|------------------|
| xiii) Greenbelt etc. | Greenbelt development and maintenance will be carried out in the boundary barriers the cost would be around (650 saplings x Rs. 200/sapling). | 1,30,000         |
|                      | Greenbelt development and maintenance will be carried out in the quarried out top benches (200 saplings x Rs. 200/sapling).                   |                  |
|                      | Greenbelt development and maintenance will be carried out in the Panchayat Road (350 saplings x Rs. 200/sapling).                             | 70,000           |
|                      | <b>Total Cost</b>   | <b>84,20,000</b> |



|  |                       |
|--|-----------------------|
| <b>B. EMP Cost: (Per year)</b>   |                       |
| Air Quality monitoring   | Rs. 52,000/-          |
| Water Quality Sampling   | Rs. 18,000/-          |
| Noise Monitoring   | Rs. 2,000/-           |
| Ground vibration test  | Rs. 4,000/-           |
| <b>Total Cost</b>  | <b>Rs. 76,000/-</b>   |
| Total EMP Cost for the Ten years period is <b>Rs.7,60,000/-</b>  |                       |
| <b>Description</b>   | <b>Amount (Rs.)</b>   |
| <b>A. Operational Cost</b>   | <b>Rs.84,20,000/-</b> |
| <b>B. EMP Cost</b>   | <b>Rs.7,60,000/-</b>  |
| <b>Total Project Cost (A+ B)</b>   | <b>Rs.91,80,000/-</b> |
| <b>C. The applicant Indents to involve corporate environment responsibilities (CER) activity like Water Purifier, Plantation, Books to Library, sanitary facility, Painting for class rooms and as per requirement to the nearby School at 2.0% from the total project cost. The Cost would be around Rs.1,84,000/-.</b> |                       |
| If the concerned authority is directed to modify the CER cost and mode of utilization of the cost, the same will be implement by the applicant.  | <b>Rs.1,84,000/-</b>  |
| <b>Total Cost</b>  | <b>Rs.93,64,000/-</b> |
| The Total cost would be around ninety three lakh and sixty four thousand only.   |                       |



## 11.0 PROGRESSIVE QUARRY CLOSURE PLAN

### 11.1 Introduction:

The entire area is proposed for a short period of 10 years only hence the progressive quarry closure plan may not be applicable to this quarry. Anyhow, during temporary discontinuance of quarry the following measures will be taken.

- Barbed wire fencing will be constructed around the quarry.
- Benches will be smoothening.
- Quarry will be closed & sentries will be posted round the clock.
- Green belt development will be maintained.
- Machineries will be removed from pit and engaged in another site.

### 11.2 Present and Post Land use pattern:

LAND USE TABLE – 16

| Description        | Present area (Ha) | Area required during the first five year (Ha) | Area at the end of lease period (Ha) |
|--------------------|-------------------|---|--------------------------------------|
| Area Under Quarry  | Nil               | 1.62.48                                       | 1.62.48                              |
| Site Services      | Nil               | 0.01.00                                       | 0.01.00                              |
| Roads              | Nil               | 0.02.00                                       | 0.02.00                              |
| Green Belt         | Nil               | 0.35.93                                       | 0.59.65                              |
| Unutilized Area    | 2.28.40           | 0.26.99                                       | 0.03.27                              |
| <b>Grand Total</b> | <b>2.28.40</b>    | <b>2.28.40</b>                                | <b>2.28.40</b>                       |

### 11.3 Statutory obligations:

The applicant ensures to comply all the conditions stipulated in the precise area communication letter before grant of quarry lease and during the course of quarry operations as per the DGMS, Department of Geology and Mines, Labour Enforcement officer, controller of Explosives etc., circulars, Norms, Rules, Regulations and Act.

### 11.4 Progressive quarry closure plan preparation:

Name and address of the Qualified Person who prepared the progressive closure plan and name, address and register number of the executing agency who is involved in the Preparation of progressive quarry closure plan.

Name : **B. VENGADAGIRI, M.Sc.,**  
 Qualified Person (Under Rule 15(I)(a) and (I)(b) of MCR, 2016)

Address : No.105, 5<sup>th</sup> Cross,  
 Alagapuram,  
 Salem District – 636 010,

Mobile : +91 86953 32233

Email : vengatb6@gmail.com

The applicant will himself implement the closure plan; no outside agency will be involved.

**(i) Safety & Security:**

Safety measures will be implemented to prevent access in the excavation area and authorized persons as per Mine Act 1952, MMR 1961.

- Safety measures will be implemented as per Mine Act 1952, MMR 1961, and Mines Rules 1955.
- Provisions of MMR 1961 shall be strictly followed and all roads shall be wider than the height of the bench or equal to the height of the bench and have a gradient of not more than 1 in 16.
- The bench height will be 5.0m.
- Width of working bench will be kept about 5.0 m for ease of operations and provide sufficient room for the movement of equipments.
- Protective equipment like dust masks, ear-plugs/ muffs and other equipments shall be provided for use by the work persons.
- Notices giving warning to prevent inadvertent entry of persons shall be displayed at all conspicuous places and in particular near mine entries.
- Danger signs shall be displayed near the excavations and proper signal by siren alarm will be given to the public before blasting to prevent accident.
- Security guards will be posted.
- In the event of temporary closer, approaches will be fenced off and notice displayed.
- Installation of CCTV cameras in the quarry and entrance of the quarry.
- Monitoring of Quarrying operation by external agency as directed by authorities.

**(ii) Disaster Management and Risk Assessment:**

This should deal with action plan for high risk accidents like landslides, subsidence, flood, fire, seismic activities, tailing dam failures etc. and emergency plan proposed for quick evacuation, ameliorative measures to be taken etc. The capability of applicant to meet such eventualities and the assistance to be required from the local authorities should be described.

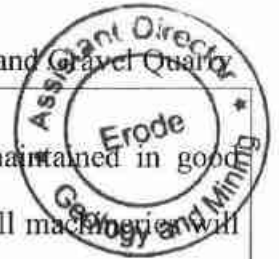
- The mechanized mining activities in the area may involve any high risk accident due to side falls/collapse, flying stones due to blasting etc.
- The complete mining operation will be carried out under the Management and control of experienced and qualified Mines Manager having Certificate of Competency to manage the mines granted by DGMS.
- All the provisions of Mines Act 1952, MMR 1961 and Mines Rules 1955, TNMMCR 1959 and other laws applicable to mine will be strictly complied with.
- During heavy rainfall the mining activities will be suspended.
- All persons in supervisory capacity will be provided with proper communication facilities.
- Competent persons will be provided FIRST AID kits which they will always carry.
- The Greenbelt Development will be formed in around the quarried out top benches and panchayat road of the lease applied area.

**Environmental Monitoring Cell:**

A dedicated team nominated by the mine manager or Agent will monitor and maintain the environmental compliances of the quarry as per the approved Environment Management Plan and report the Compliance to the Mine Manager half yearly.

**Disaster Management Cell:**

The Competent Qualified Statutory managers appointed by the applicant as per the Director of Mines Safety will be responsible for Disaster Management. In case of any eventualities his mobile number will be displayed and he will take all the precautions and safety measures as per Mines and Minerals (Development and Regulations) Act, 1957.

**(iii) Disposal of mining machinery**

All the Machineries will be purchased fresh; the same has been maintained in good condition during entire life of quarry. After completion of quarry operation all machinery will be utilized at another quarry area or sold out to the second hand. Hence, disposal or decommissioning of mining machinery does not arise.

**(iv) Care and Maintenance during Temporary Discontinuance:**

In case of any temporary discontinuance due to court order or due to statutory requirement or any other unforeseen circumstance following measures shall be taken for care, maintenance and monitoring of conditions.

- Notice of temporary discontinuance of work in mine shall be given to the DGMS as per the MMR 1961.
- All the mining machinery shall be shifted to a safe place.
- Entrance to the mine or part of the mine, to be discontinued shall be fenced off. Fencing shall be as per the circular 11/1959 from DGMS.
- Security Guards shall be posted for the safety and to prevent any unauthorized entry to the area.
- Carry out regular maintenance of the facilities/area detailed below in such a way as would have been done as if the mines were operation:
  - Quarry roads and approach roads,
  - Fencing on approach roads,
  - Checking and maintenance of machines and equipment,
  - Drinking water arrangements,
  - Quarry office, first aid stations etc.
- Competent persons shall inspect the area regularly.
- Air, water and other environmental monitoring shall be carried out as per CPCB and IBM Guideline.
- Care and upkeep of plantation shall be carried out on regular basis.
- Status of the working and status monitoring for re-opening of the mines shall be discussed daily.

In case of discontinuance due to any natural calamities/abnormal conditions, mining operation will be restarted as early as possible after completing rescue work, restoring safety and security, repairs of roads etc.

**(v) Economic Repercussion of Closure of Quarry and manpower Retrenchments.**

The quarry lease is granted for a period of ten years only. As per the production Programme envisaged, there will be no effect on the man power as the majority of persons belong to nearby villages and will have an option either to be available for employment for the next contract/ lease or do the agriculture in their fields.

**(vi) Abandonment Cost:**

As at present mining is not going to be closed so abandonment cost could not be assessed. However, based on the progressive quarry closure activities during the plan period, cost is assessed as given below at present scenario:

**TABLE – 17**

| ACTIVITY   |                | YEAR          |       |                          |       |       |       |       |       |       |       | RATE               | COST<br>(Rs.)   |
|--|----------------|---------------|-------|--------------------------|-------|-------|-------|-------|-------|-------|-------|--------------------|-----------------|
|  |                | I             | II    | III                      | IV    | V     | VI    | VII   | VIII  | IX    | X     |                    |                 |
| Plantation under safety zone                             | No. of sapling | 80            | 80    | 80                       | 80    | 80    | 50    | 50    | 50    | 50    | 50    | Rs.100 Per sapling | 1,30,000        |
|  | Cost           | 16000         | 16000 | 16000                    | 16000 | 16000 | 10000 | 10000 | 10000 | 10000 | 10000 |                    |                 |
| Plantation in quarried out top benches and approach road |                | Approach Road |       | Quarried out top Benches |       |       |       |       |       |       |       | Rs.100 Per sapling | 1,10,000        |
|  | No. of sapling | 200           | -     | 50                       | 50    | 50    | 50    | 50    | 50    | 50    | 50    |                    |                 |
|  | Cost           | 40000         | -     | 10000                    | 10000 | 10000 | 10000 | 10000 | 10000 | 10000 | 10000 |                    |                 |
| Wire Fencing for 610 Mtrs length                         |                | 183000        | -     | -                        | -     | -     | -     | -     | -     | -     | -     | Rs. 300 Per Meter  | 1,83,000        |
| Garland Drain with settling tanks for 540 Mtrs length    |                | 162000        | -     | -                        | -     | -     | -     | -     | -     | -     | -     | Rs. 300 Per Meter  | 1,62,000        |
| <b>Total</b>   |                |               |       |                          |       |       |       |       |       |       |       |                    | <b>5,85,000</b> |

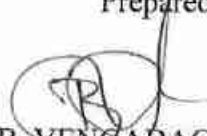
**12.0 ANY OTHER DETAILS INTEND TO FURNISH BY THE APPLICANT**

This Mining plan for Rough stone (Charnockite) and Gravel is under Rules 41 & 42 as per the Amended under Tamil Nadu Minor Mineral Concession Rules, 1959. The provisions of the Mines Act, Rules and Regulations and orders made there under shall be complied with in the quarrying operation, 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. Any violation pointed out by the inspecting authorities shall be rectified and modified after scrutiny comments as per the guidelines of the Concerned Department and Authorities.

This Mining Plan and mine design is prepared based on the requirement instructed by the applicant to me. If there is any change in the production schedule, change of technology, change in product mix during the course of operations, the applicant is advice to prepare a modified mining plan and get approval by the concerned authority for subsequent clearance and approval. The same will be monitored by the inspecting authority of Department of Geology and mining and other Concerned Departments under Rule 25 and sub rule (5)(d) in Rule 36 of Tamil Nadu Minor Mineral Concession Rules, 1959.

I hereby ensure that the information provided is correct to best of my knowledge and experience, some of the information contained in this report has been provided by external sources and by the applicant and is presented as the form as submitted by the applicant. The information is not intended to serve as legal advice related to the individual situation. I do not owe and specifically disclaim any liability resulting from the use during the course of quarrying operations after the grant of lease. The document may be scrutinized by the competent authority before approval.

Prepared by

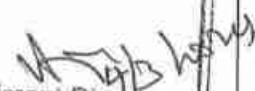
  
B. VENKADAGIRI, M.Sc.,  
Qualified Person

Place: Salem

Date: 23.02.2024

This Mining Plan is approved subject to the conditions indicated in the Mining Plan approved letter in  
R.C. No. 152/2023 Mining  
Dated: 1.3.2024

This Mining Plan is approved as per the Powers conferred under Rule 41 (2) of Tamil Nadu Minor Mineral Concession Rules, 1959

  
Assistant Director,  
Geology and Mining,  
Erode.

TOPOGRAPHICAL VIEW OF KURUMBAPALAYAM ROUGH STONE  
GRAVEL QUARRY LEASE APPLIED AREA



உதவி இயக்குநர் அலுவலகம்,  
புவியியல் மற்றும் சுரங்கத்துறை,  
ஈரோடு



ந.க. 152/கனிமம்/2023

நாள்: 12.02.2024.

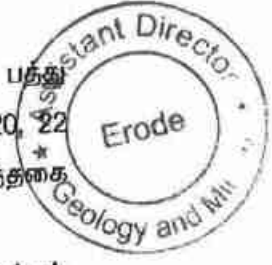
குறிப்பாணை

**பொருள்:** கனிமங்களும் குவாரிகளும் - ஈரோடு மாவட்டம் - சிறுகனிமம் - சாதாரணக்கற்கள் மற்றும் கிராவல் - சத்தியமங்கலம்/வட்டம் - குரும்பாளையம் கிராமம் - புல எண்கள். 151 (பகுதி) (1.29.90) மற்றும் 152/4 (0.98.50) ஆகியவற்றில் மொத்தம் 2.28.40 ஹெக்டர் பரப்பில் சாதாரணக்கற்கள் மற்றும் கிராவல் மண் வெட்டி எடுக்க குவாரி குத்தகை உரிமம் கோரி திரு. என்.டி. சாய்சதா, த/பெ. தியாகராஜ் என்பவர் விண்ணப்பம் அளித்தது - அங்கீகரிக்கப்பட்ட சுரங்கத்திட்டம் மற்றும் சுற்றுச் சூழல் ஒப்புதல் பெற்று அளிக்க கோருதல் - தொடர்பாக.

- பார்வை:**
1. திரு. என்.டி. சாய்சதா என்பவரின் மனு நாள் 16.03.2023 (பெறப்பட்ட நாள் 21.03.2023).
  2. வட்டார வளர்ச்சி அலுவலர் (கி.ஊ), பவானிசாகர் கடிதம் ந.க. எண் 1108/2020/ஆ1 நாள் 23.05.2023.
  3. மாவட்ட நகர் ஊரமைப்பு துணை இயக்குநர் (பொ), ஈரோடு கடிதம் ந.க. எண் 696/2023/ஈமா-3 நாள் 26.05.2023.
  4. சத்தியமங்கலம் வருவாய் வட்டாட்சியரின் அறிக்கை ந.க. 2155/2023/ஆ3 நாள் 10.05.2023.
  5. கோபிசெட்டிபாளையம் வருவாய் கோட்டாட்சியர் அவர்களின் அறிக்கை ந.க. 2762/2023/ஆ3 நாள் 16.06.2023.
  6. துணை இயக்குநர் (மு.கூ.பொ), சத்தியமங்கலம் வனக்கோட்டம், சத்தியமங்கலம் கடிதம் ந.க. எண். 2053/2023/வ, நாள் 30.06.2023.
  7. ஈரோடு புவியியல் மற்றும் சுரங்கத்துறை உதவி இயக்குநரின் தணிக்கை குறிப்பு நாள்: 28.07.2023.
  8. அரசு அணை எண் 169 தொழில் (எம்எம்சி1) துறை நாள் 04.08.2020.

ஈரோடு மாவட்டம், சத்தியமங்கலம் வட்டம், குரும்பாளையம் கிராமம், புல எண்கள். 151 (பகுதி) (1.29.90) மற்றும் 152/4 (0.98.50) ஆகியவற்றில் மொத்தம் 2.28.40 ஹெக்டர் பரப்பில் சாதாரண கற்கள் மற்றும் கிராவல் மண் வெட்டியெடுக்க பத்து ஆண்டுகளுக்கு திரு. என்.டி. சாய்சதா, த/பெ. தியாகராஜ் என்பவர் விண்ணப்பித்ததன் பேரில் குவாரிக் குத்தகை உரிமம் வழங்குவது தொடர்பாக, பவானிசாகர் வட்டார வளர்ச்சி அலுவலர் (கி.ஊ), நகர் ஊரமைப்பு துணை இயக்குநர் (பொ), ஈரோடு பவானி வருவாய் வட்டாட்சியர், கோபிசெட்டிபாளையம் வருவாய் கோட்டாட்சியர், புவியியல் மற்றும் சுரங்கத்துறை உதவி இயக்குநர் மற்றும் துணை இயக்குநர் (மு.கூ.பொ), சத்தியமங்கலம் வனக்கோட்டம், சத்தியமங்கலம் ஆகியோர் மேற்காணும் விண்ணப்பப் புல எண்கள். 151 (பகுதி) (1.29.90)





மற்றும் 152/4 (0.98.50) ஆகியவற்றில் மொத்தம் 2.28.40 ஹெக்டர் பரப்பில் பத்து ஆண்டுகளுக்கு தமிழ்நாடு சிறுகனிம சலுகை விதிகள், 1959-ன் விதி எண். 19 (1), 20, 22 ஆகியவற்றின் கீழ் சாதாரண கற்கள் மற்றும் கிராவல் மண் வெட்டியெடுக்க குவாரி குத்தகை உரிம அனுமதி சில நிபந்தனைக்குட்பட்டு வழங்கலாம் என பரிந்துரை செய்துள்ளனர்.

எனவே, மேற்காணும் பரிந்துரைகளின் அடிப்படையில் ஈரோடு மாவட்டம், சத்தியமங்கலம் வட்டம், குரும்பாளையம் கிராமம், புல எண்கள். 151 (பகுதி) (1.29.90) மற்றும் 152/4 (0.98.50) ஆகியவற்றில் மொத்தம் 2.28.40 ஹெக்டர் பட்டா நிலத்தில், திரு. என்.டி. சாய்சதா, த/பெ. தியாகராஜ் என்பவருக்கு குவாரி குத்தகை ஒப்பந்த ஆவணம் நிறைவேற்றப்பட்ட நாளிலிருந்து பத்து ஆண்டுகளுக்கு சாதாரணக்கற்கள் மற்றும் கிராவல் மண் வெட்டி எடுக்க குவாரி குத்தகை உரிமம் வழங்குவது தொடர்பாக கீழ்க்காணும் நிபந்தனைகளுக்கு உட்பட்டு ஈரோடு உதவி இயக்குநரால் ஏற்பளிக்கப்பட்ட சுரங்கத் திட்டம் மற்றும் மாநில சுற்றுச் சூழல் அமைப்பிடம் இருந்து பெறப்பட்ட சுற்றுச்சூழல் ஒப்புதல் ஆகியன உரிய காலத்திற்குள் விண்ணப்பதாரால் பெற்றளிக்கப்பட வேண்டும் என தெரிவிக்கப்படுகிறது.

1. புலத்தை சுற்றி அமைந்துள்ள பட்டா நிலங்களுக்கு 7.5 மீட்டர் பாதுகாப்பு இடைவெளி விட்டு குவாரி பணிபுரிய வேண்டும்.

உதவி இயக்குநர்,  
புவியியல் மற்றும் சுரங்கத்துறை,  
ஈரோடு.

பெறுநர்

திரு. என்.டி. சாய்சதா,  
த/பெ. தியாகராஜ்,  
12, காந்திஜி 3வது வீதி,  
கரூர் பைபாஸ் ஈரோடு,  
ஈரோடு - 638 002.

Survey Old No. 88, New No. 21-1, 1971



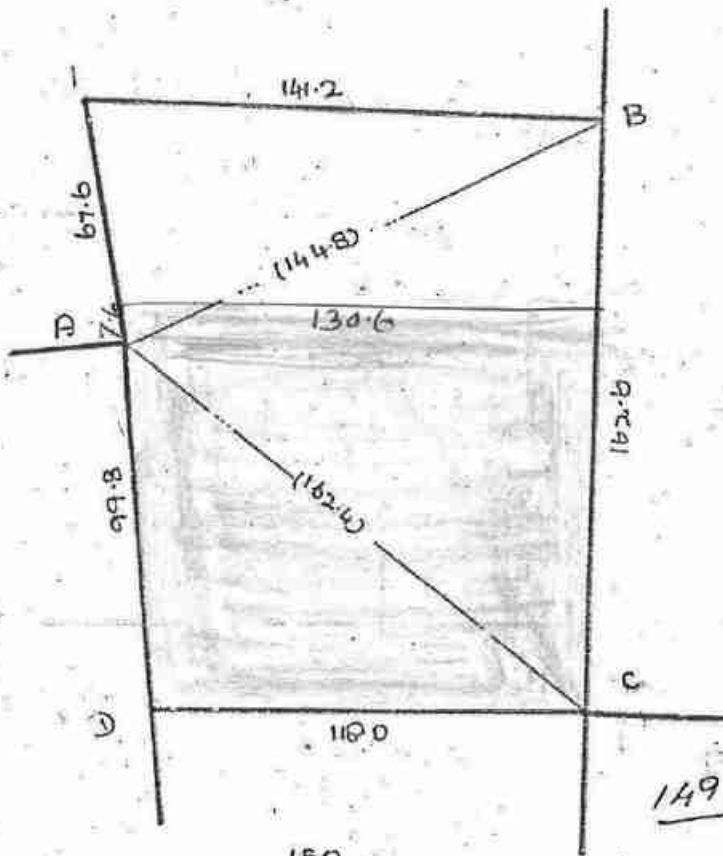
District கன்னியாகுமரி  
 Village சத்தியமலை  
 Name சத்தியமலை  
 Area 2.160 சதுரமீ

No. 54 48  
 Name சத்தியமலை  
 Area 2.160 சதுரமீ

Field No. 151

5-33 1/2

R.P



152

140

149

150

25/11/2021  
 கனம் இராஜா சாமிநாதர்  
 44, சிலகாசாலை, சத்தியமலை.  
 43, சத்தியமலை, சத்தியமலை.  
 42, சத்தியமலை, சத்தியமலை.

Lease Applied Area-

|   |      |       |      |   |
|---|------|-------|------|---|
|   |      | e     |      |   |
|   |      | 162.4 |      |   |
|   |      | 157.4 | 71.6 | D |
|   |      | A     |      |   |
|   |      | B     |      |   |
|   |      | 144.8 |      |   |
| 1 | 64.8 | 19.4  |      |   |
|   |      | A     |      |   |

Prepared by  
 M. Kumara Sarathy  
 25.11.22

Scale from 200m field One Chain

25-11-22

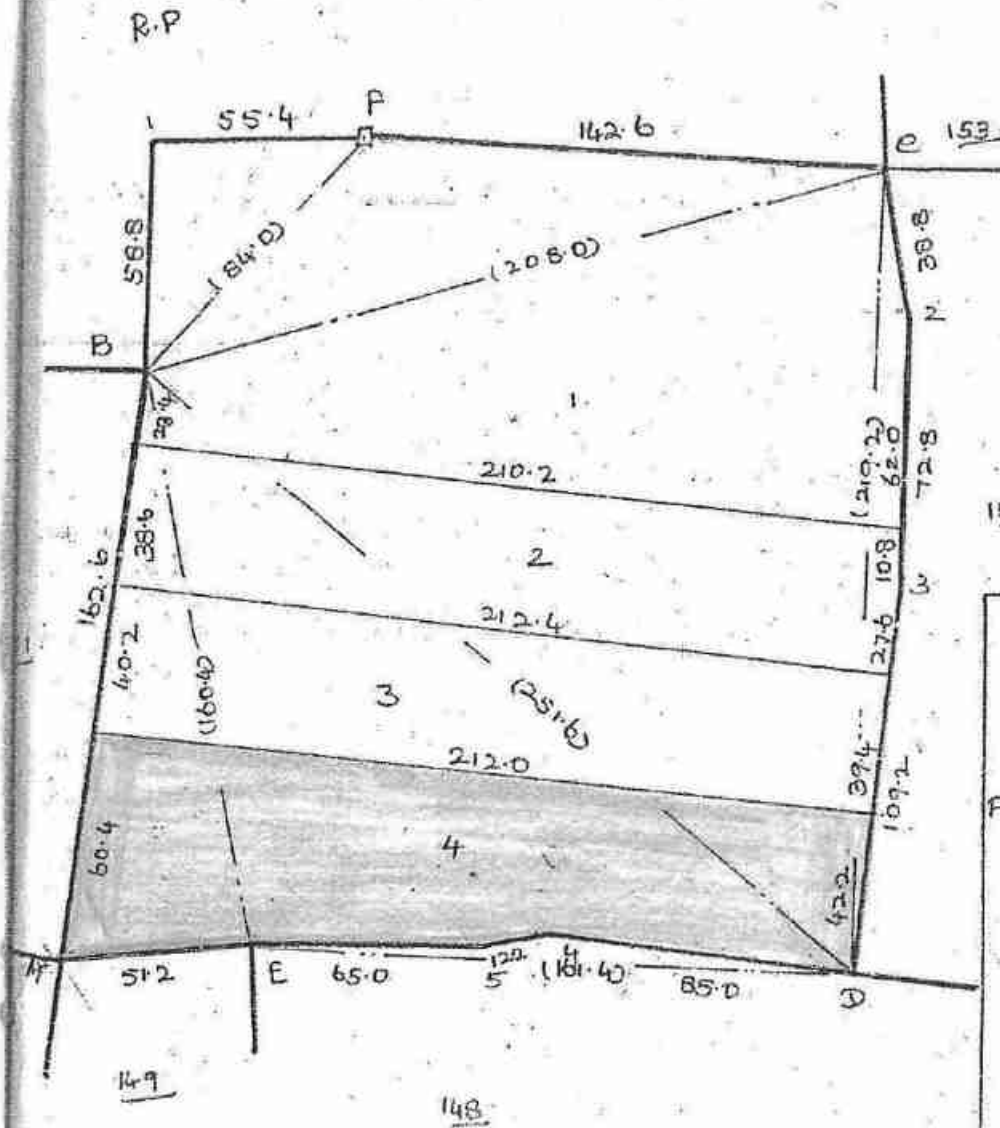
செவ்வயல்பட்டினம்  
 சி. சி. வ. ல. ப. சி. க. க. க.  
 செவ்வயல்பட்டினம்

Survey Old No. 25, New No. 21-7,49,871

Village { No. 5448

Field No. 152

Name செவ்வயல்பட்டினம்  
 Area 4-44.5 சென்.



|   |      |       |       |   |
|---|------|-------|-------|---|
|   |      | 251.6 |       |   |
|   |      | 124.4 | 100.6 | E |
|   |      | B     |       |   |
|   |      | 160.4 |       |   |
|   |      | 56    |       |   |
|   |      | E     |       |   |
|   |      | B     |       |   |
|   |      | 162.6 |       |   |
|   |      | 9.8   | 50.0  | E |
|   |      | A     |       |   |
|   |      | E     |       |   |
|   |      | 11.4  |       |   |
|   |      | 95.6  | 3.4   | 5 |
|   |      | 54.6  | 5.6   | 4 |
|   |      | D     |       |   |
|   |      | 219.2 |       |   |
| 3 | 10.4 | 110.6 |       |   |
| 2 | 8.2  | 38.0  |       |   |
|   |      | E     |       |   |
|   |      | P     |       |   |
|   |      | 84.0  |       |   |
|   |      | 44.2  |       |   |
|   |      | E     |       |   |
|   |      | 208.0 |       |   |
|   |      | 136.0 | 43.0  | P |
|   |      | e     |       |   |

சுரேஷ்  
 23/11/2021  
 கிராம நிர்வாக அலுவலர்  
 44. விண்ணப்பாளர்,  
 43. குடும்பபாளையம்,  
 சத்தியமங்கலம் வட்டம்.

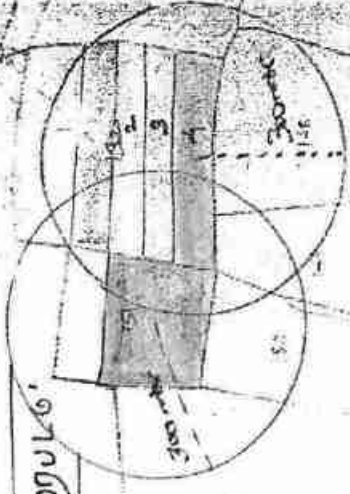
Lease Applied Area

Drawn by  
 M. Mania Sannay

Scale: 1 inch = 2000 feet



44. അപന്തം  
പുഴ



കിരീടം നർവ്വഹണ ഓഫീസിൽ  
2-4 മിഷൻ ചെയ്തത്  
4-3 ക്രമപത്രങ്ങൾ

പ്രൊഫ. എ. സി. ജോർജ്ജ്  
44. അപന്തം പട്ടണം  
കൃഷി വകുപ്പ്  
കൃഷി വകുപ്പ്

Lease Applied For



தமிழ்நாடு அரசு  
வருவாய்த் துறை



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

மாவட்டம் : ஈரோடு

வட்டம் : சத்தியமங்கலம்

வருவாய் கிராமம் : 048 குகும்பாளையம்

பட்டா எண் : 988

உரிமையாளர்கள் பெயர்

| 1. தியாகராஜ் |           | மகன்       |         | சாய்சதா    |         |            |         |  |
|--------------|-----------|------------|---------|------------|---------|------------|---------|--|
| புல எண்      | உட்பிரிவு | புன்செய்   |         | நன்செய்    |         | மற்றவை     |         | குறிப்புரைகள்                            |
|              |           | பரப்பு     | தீர்வை  | பரப்பு     | தீர்வை  | பரப்பு     | தீர்வை  |  |
|              |           | ஹெக் - ஏர் | ரூ - பை | ஹெக் - ஏர் | ரூ - பை | ஹெக் - ஏர் | ரூ - பை |  |
| 151          | -         | 2 - 16.00  | 2.98    | --         | --      | --         | --      | 2017/0103/10/056933-<br>-- -- 09-08-2017 |
|              |           | 2 - 16.00  | 2.98    |            |         |            |         |  |

குறிப்பு2 :



- மேற்கண்ட தகவல் / சான்றிதழ் நகல் விவரங்கள் யின் பதிவேட்டிலிருந்து பெறப்பட்டவை. இவற்றை தாங்கள் <https://eservices.tn.gov.in> என்ற இணைய தளத்தில் 10/32/048/00988/190805 என்ற குறிப்பு எண்ணை உள்ளீடு செய்து உறுதி செய்துகொள்ளவும்.
- இத் தகவல்கள் 23-02-2024 அன்று 04:09:38 PM நேரத்தில் அச்சடிக்கப்பட்டது.
- கைப்பேசி கேமராவின் 2D barcode படிப்பான் மூலம் படித்து 3G/GPRS வழி இணையதளத்தில் சரிபார்க்கவும்



தமிழ்நாடு அரசு  
வருவாய்த் துறை



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

மாவட்டம் : ஈரோடு

வட்டம் : சத்தியமங்கலம்

வருவாய் கிராமம் : 048 குரும்பாளையம்

பட்டா எண் : 993

உரிமையாளர்கள் பெயர்

1. தியாகராஜ்

மகன்

சாய்சதா

| புல எண் | உட்பிரிவு | புன்செய்   |         | நன்செய்    |         | மற்றவை     |         | குறிப்புரைகள்                               |
|---------|-----------|------------|---------|------------|---------|------------|---------|---|
|         |           | பரப்பு     | தீர்வை  | பரப்பு     | தீர்வை  | பரப்பு     | தீர்வை  |   |
|         |           | ஹெக் - ஏர் | ரூ - பை | ஹெக் - ஏர் | ரூ - பை | ஹெக் - ஏர் | ரூ - பை |   |
| 152     | 4         | 0 - 98.50  | 1.36    | --         | --      | --         | --      | 2017/0103<br>/10/057087---<br>-- 12-08-2017 |
|         |           | 0 - 98.50  | 1.36    |            |         |            |         |   |

குறிப்பு 2 :



1. மேற்கண்ட தகவல் / சான்றிதழ் நகல் விவரங்கள் மின் பதிவேட்டிலிருந்து பெறப்பட்டவை. இவற்றை தாங்கள் <https://eservices.tn.gov.in> என்ற இணைய தளத்தில் 10/32/048/00993/190851 என்ற குறிப்பு எண்ணை உள்ளிட்டு செய்து உறுதி செய்துகொள்ளவும்.
2. இத் தகவல்கள் 15-02-2024 அன்று 11:39:31 AM நேரத்தில் அச்சடிக்கப்பட்டது.
3. கைப்பேசி கேமராவின் 2D barcode படிப்பான் மூலம் படித்து 3G/GPRS வழி இணையதளத்தில் சரிபார்க்கவும்



**44. ಕರ್ನಾಟಕ ಸರ್ಕಾರದ ಅಧೀನದಲ್ಲಿರುವ ಸರ್ಕಾರಿ ಕಾರ್ಖಾನೆಗಳಲ್ಲಿನ ಕಾರ್ಮಿಕರ ಕಲ್ಯಾಣ ಕಾಯಿದೆ, 1947 ಅಡಿಯಲ್ಲಿನ ಕಾರ್ಯನಿರ್ವಹಣಾ ವಿಧಾನ**

| ಕ್ರ. ಸಂ. / ಕಾರ್ಯನಿರ್ವಹಣಾ ವಿಧಾನ | ಸರ್ಕಾರಿ ಕಾರ್ಮಿಕರ ಕಲ್ಯಾಣ ಕಾಯಿದೆ, 1947 ಅಡಿಯಲ್ಲಿನ ಕಾರ್ಯನಿರ್ವಹಣಾ ವಿಧಾನ | ಸರ್ಕಾರಿ ಕಾರ್ಮಿಕರ ಕಲ್ಯಾಣ ಕಾಯಿದೆ, 1947 ಅಡಿಯಲ್ಲಿನ ಕಾರ್ಯನಿರ್ವಹಣಾ ವಿಧಾನ | ಸರ್ಕಾರಿ ಕಾರ್ಮಿಕರ ಕಲ್ಯಾಣ ಕಾಯಿದೆ, 1947 ಅಡಿಯಲ್ಲಿನ ಕಾರ್ಯನಿರ್ವಹಣಾ ವಿಧಾನ |         |         |         |         | ಸರ್ಕಾರಿ ಕಾರ್ಮಿಕರ ಕಲ್ಯಾಣ ಕಾಯಿದೆ, 1947 ಅಡಿಯಲ್ಲಿನ ಕಾರ್ಯನಿರ್ವಹಣಾ ವಿಧಾನ |         |         |         |         | ಒಟ್ಟು   |         |         |         |         |         |         |         |         |         |
|--------------------------------|--|--|--|---------|---------|---------|---------|--|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|
|                                |  |  | 1  | 2       | 3       | 4       | 5       | 6  | 7       | 8       | 9       | 10      |         | 11      | 12      | 13      | 14      | 15      | 16      | 17      | 18      | 19      |
| 152                            | 1965-66  | 1965-66  | 1965-66  | 1965-66 | 1965-66 | 1965-66 | 1965-66 | 1965-66  | 1965-66 | 1965-66 | 1965-66 | 1965-66 | 1965-66 | 1965-66 | 1965-66 | 1965-66 | 1965-66 | 1965-66 | 1965-66 | 1965-66 | 1965-66 | 1965-66 |
| 2                              | 1965-66  | 1965-66  | 1965-66  | 1965-66 | 1965-66 | 1965-66 | 1965-66 | 1965-66  | 1965-66 | 1965-66 | 1965-66 | 1965-66 | 1965-66 | 1965-66 | 1965-66 | 1965-66 | 1965-66 | 1965-66 | 1965-66 | 1965-66 | 1965-66 | 1965-66 |
| 3                              | 1965-66  | 1965-66  | 1965-66  | 1965-66 | 1965-66 | 1965-66 | 1965-66 | 1965-66  | 1965-66 | 1965-66 | 1965-66 | 1965-66 | 1965-66 | 1965-66 | 1965-66 | 1965-66 | 1965-66 | 1965-66 | 1965-66 | 1965-66 | 1965-66 | 1965-66 |
| 4                              | 1965-66  | 1965-66  | 1965-66  | 1965-66 | 1965-66 | 1965-66 | 1965-66 | 1965-66  | 1965-66 | 1965-66 | 1965-66 | 1965-66 | 1965-66 | 1965-66 | 1965-66 | 1965-66 | 1965-66 | 1965-66 | 1965-66 | 1965-66 | 1965-66 | 1965-66 |
| 151                            | 1965-66  | 1965-66  | 1965-66  | 1965-66 | 1965-66 | 1965-66 | 1965-66 | 1965-66  | 1965-66 | 1965-66 | 1965-66 | 1965-66 | 1965-66 | 1965-66 | 1965-66 | 1965-66 | 1965-66 | 1965-66 | 1965-66 | 1965-66 | 1965-66 | 1965-66 |



1965-66

**Signature**  
**Assistant Director**  
 44, ಕರ್ನಾಟಕ ಸರ್ಕಾರದ ಅಧೀನದಲ್ಲಿರುವ ಸರ್ಕಾರಿ ಕಾರ್ಖಾನೆಗಳಲ್ಲಿನ ಕಾರ್ಮಿಕರ ಕಲ್ಯಾಣ ಕಾಯಿದೆ, 1947 ಅಡಿಯಲ್ಲಿನ ಕಾರ್ಯನಿರ್ವಹಣಾ ವಿಧಾನ

1965-66

## அ-பதிவேடு விவரங்கள்



மாவட்டம் : ஈரோடு

வட்டம் : சத்தியமங்கலம்

கிராமம் : 048 குரும்பாளையம்

|                              |              |                                |           |
|------------------------------|--------------|--------------------------------|-----------|
| 1. புல எண்                   | 152          | 9. மண் வயனமும<br>ரகமும்        | 8 - 4     |
| 2. உட்பிரிவு எண்             | 4            | 10. மண் தரம்                   | 6         |
| 3. பழைய புல<br>உட்பிரிவு எண் | 196,227A,228 | 11. தீர்வை (ரூ - ஹெ)           | 1.38      |
| 4. பகுதி                     | -            | 12. பரப்பு (ஹெக்டேர் -<br>ஏர்) | 0 - 98.50 |
| 5. அரசு / ரயத்துவாரி         | ரயத்துவாரி   | 13. மொத்த தீர்வை (ரூ<br>- பை)  | 1.36      |
| 6. நிலத்தின் வகை             | புஞ்சை       | 14. பட்டா எண்                  | 993       |
| 7. பாசன ஆதாரம்               | -            | 15. குறிப்பு                   | -         |
| 8. இரு போகமா                 | -            | 16. பெயர்                      | 1.சாய்சதா |

## குறிப்பு 1:



1. மேற்கண்ட தகவல் / சான்றிதழ் நுகல் விவரங்கள் மின் பதிவேட்டிலிருந்து பெறப்பட்டவை. இவற்றை தாங்கள் <https://eservices.tn.gov.in> என்ற இணைய தளத்தில் 10/32/048/152/4/110851 என்ற குறிப்பு எண்ணை உள்ளீடு செய்து உறுதி செய்துகொள்ளவும்.



அ-பதிவேடு விவரங்கள்



மாவட்டம் : ஈரோடு

வட்டம் : சத்தியமங்கலம்

கிராமம் : 048 குரும்பாளையம்

|                              |            |                                |           |
|------------------------------|------------|--------------------------------|-----------|
| 1. புல எண்                   | 151        | 9. மண் வயனமும்<br>ரகமும்       | 8 - 4     |
| 2. உட்பிரிவு எண்             | -          | 10. மண் தரம்                   | 6         |
| 3. பழைய புல<br>உட்பிரிவு எண் | 228        | 11. தீர்வை (ரூ - ஹெ)           | 1.38      |
| 4. பகுதி                     | -          | 12. பரப்பு (ஹெக்டேர் -<br>ஏர்) | 2 - 16.00 |
| 5. அரசு / ரயத்துவாரி         | ரயத்துவாரி | 13. மொத்த தீர்வை (ரூ<br>-பை)   | 2.98      |
| 6. நிலத்தின் வகை             | பஞ்சை      | 14. பட்டா எண்                  | 988       |
| 7. பாசன ஆதாரம்               | -          | 15. குறிப்பு                   | -         |
| 8. இரு போகமா                 | -          | 16. பெயர்                      | 1.சாய்சதா |




குறிப்பு 1:



1. மேற்கண்ட தகவல் / சான்றிதழ் நகல் விவரங்கள் மின் பதிவேட்டிலிருந்து பெறப்பட்டவை. இவற்றை தாங்கள் <https://eservices.tn.gov.in> என்ற இணைய தளத்தில் 10/32/048/151/-/110805 என்ற குறிப்பு எண்ணை உள்ளீடு செய்து உறுதி செய்துகொள்ளவும்.

ANNEXURE 11



|  |  |                              |
|--|--|------------------------------|
| आयकर विभाग<br>INCOME TAX DEPARTMENT  |     | भारत सरकार<br>GOVT. OF INDIA |
| N T SAISADA  |  |                              |
| THIYAGARAJAN SADASIVAM   |  |                              |
| 14/04/1978   |  |                              |
| Permanent Account Number   |  |                              |
| AUBPS5020P   |  |                              |
| <br>Signature |  | 21102015                     |

 भारत सरकार  
Government of India

 Issue Date: 08/06/2017

நொதி சாய்சதா  
N T Saisada  
பிறந்த நாள் / DOB: 14/04/1978  
ஆண் / MALE

 8469 1057 5792

मेरा आधार, मेरी पहचान

 Assistant Director  
Erode  
Geology and Mining

 भारतीय विशिष्ट पहचान प्राधिकरण  
Unique Identification Authority of India

 AADHAAR

முகவரி: கந்தை / தாய் பெயர்: தியாகராஜ்,  
12, காந்திஜி 3வது வீதி, கரூர் பைபாஸ்  
ரோடு, #ரோடு, #ரோடு, தமிழ் நாடு,  
638002

Print Date: 18/04/2021

Address: S/O: Thyagaraj, 12, GANDHIJI  
3RD STREET, KARUR BYEPASS ROAD,  
Erode, Erode, Tamil Nadu, 638002



8469 1057 5792

 1947  help@uidai.gov.in  www.uidai.gov.in

அண்ணாமலைப்



பல்கலைக்கழகம்

ANNAMALAI

UNIVERSITY



அறிவியற்புலம்  
FACULTY OF SCIENCE



மே, 2011 இல்

பயன்பாட்டு நிலத்தியல்

பிரிவில்

நடத்திய தேர்வுகளில்

வெங்கடகிரி பா

கூடுதல்

மதிப்புப்புள்ளிகள் 10.00 க்கு சராசரியாக 6.03 பெற்று

இரண்டாம் வகுப்பில்

தேர்ச்சியடைந்து முறையாக அமைக்கப்பெற்ற தேர்வுக்குழுவினர் சான்றளித்தபடி,

அறிவியல் நிறைஞர்

பட்டம்

பெறுவதற்கு

உரியவர்

ஆகின்றார்

என அண்ணாமலைப் பல்கலைக்கழக ஆளவை இதன்வழி அறிவிக்கின்றது.

The Senate of the ANNAMALAI UNIVERSITY hereby makes known

that VENGATAGIRI B

has been admitted to the

Degree of MASTER OF SCIENCE in

APPLIED GEOLOGY,

he/she having secured OGPA of 6.03 out of 10.00 been certified

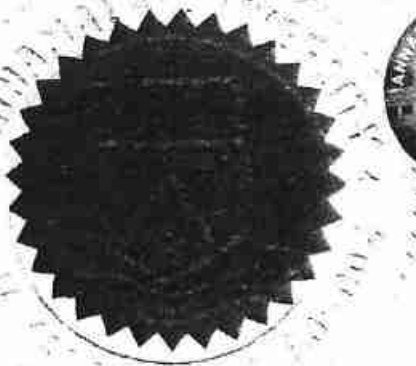
by duly appointed Examiners at the Examination held in

MAY, 2011 to be qualified to receive the same, and that

he/she was placed in SECOND CLASS.

பல்கலைக்கழக முத்திரை பெறுகின்றது

Given under the seal of the University



அண்ணாமலைநகர்  
Annamalainagar

நாள்:

Dated: 09/11/2011

76 A

துணை தேர்வாளையர் (கல்விசார்ந்த)

Dy. Controller of Examinations (Academic)

Dr. M. Rathinasabapathi

பதிவாளர்

Registrar

Dr. M. Ramanathan

துணை வேந்தர்

Vice-Chancellor

MINISTRY OF LABOUR AND EMPLOYMENT DIRECTORATE OF MINES SAFETY

Certificate of practical experience granted by the Manager to a Candidate to Director's / surveyor's / Mining Foreman / Mining Mate / Blasters Certificate of Competency Examination under the metalliferous Mines Regulations 1961.



I M. S. PAVEL being the owner / Agent / Manager of K. PITCHAMPATTI MULTI COLOUR GRANITE Mine belonging to Ms. R. ANANDKUMAR LOKIA do hereby certify that Sri B. VENKADAGIRI S/O Sri D. BALASUBRAMANIAN whose signature is appended worked in the above Mines from 10-07-2012 to 21-12-2015 and is still working. During his term of work, he has obtained practical experience as detailed overleaf. The duties connected with his work have involved his continuous attendance at the Mine and have been efficiently performed by him.

I believe him to be a good character and a fit and proper person to be examined for a certificate of competency.

For K. Pitchampatti Multicolour Granite Mines

Signature with Date M. S. PAVEL (MANAGER (MINES))  
Owner/Agent/ Manager MULTICOLOUR GRANITE MINE  
K. PITCHAMPATTI,  
Post K. PITCHAMPATTI - TALUK & DIST.  
District KARUR  
State TAMILNADU

B. Venkadagiri  
Signature of the Candidate

State the name of the Mineral Works MULTICOLOUR GRANITE

*Self attested*  
B. Venkadagiri

*Self attested*  
M. S. PAVEL

| Sl.No.             | Particulars of practical Experience   | Place of Experience | Period of practical Experience | Years     | Months    | Days      |
|--------------------|---|---------------------|--------------------------------|-----------|-----------|-----------|
|                    |   |                     | From To                        |           |           |           |
| 1.                 | Trainee in drilling operation   | Open cast           | 16.07.2012 to 24.10.13         | 01        | 03        | 16        |
| 2.                 | Trainee in Heavy blasting operation   | Open cast           | 25.10.13 to 31.12.14           | 01        | 02        | 07        |
| 3.                 | Production on Inching quality control and Supervision of Eastern mining machinery |                     | 01.01.15 to 21.10.15           | 00        | 09        | 21        |
| <b>GRAND TOTAL</b> |   |                     |                                | <b>03</b> | <b>03</b> | <b>14</b> |
| <b>IN WORDS:-</b>  |   |                     |                                |           |           |           |

AVERAGE MONTHLY OUTPUT (A) AVERAGE DAILY EMPLOYMENT (B) DURING THE ABOVE AGE IS GIVEN BELOW

| In below ground working  | In Open cast working                       | In all                             |
|--------------------------|--|------------------------------------|
| Average monthly output   | Average monthly output = 200m <sup>3</sup> | Monthly output = 200m <sup>3</sup> |
| Average daily employment | Average daily employment = 25              | Daily employment = 25              |

For K.Pitchampatti Multicolour Granite Mines

  
SIGNATURE OF THE CANDIDATE

  
SIGNATURE OF MANAGER  
WITH DATE  
MANAGER (MINES)  
MULTICOLOUR GRANITE MINE  
K. PITCHAMPATTI,  
KARUR - TALUK & DIST.

**INSTRUCTIONS:-**

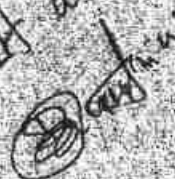
State clearly the nature of duties.

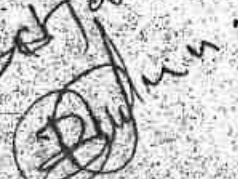
State whether on surface in open cast working or below ground.

State specifically the persons spent by the applicant in the different mining operations on serving operation as the case may be. The employment has not been must as the invocations attendance of the applicant at the mine. If must stand how many weeks and how many days he was employed at the mine. Whether underground or above ground and in what capacity.

Delete if the mine is Metalliferous mine.

Delete if the mine coal mine.

Self attested  


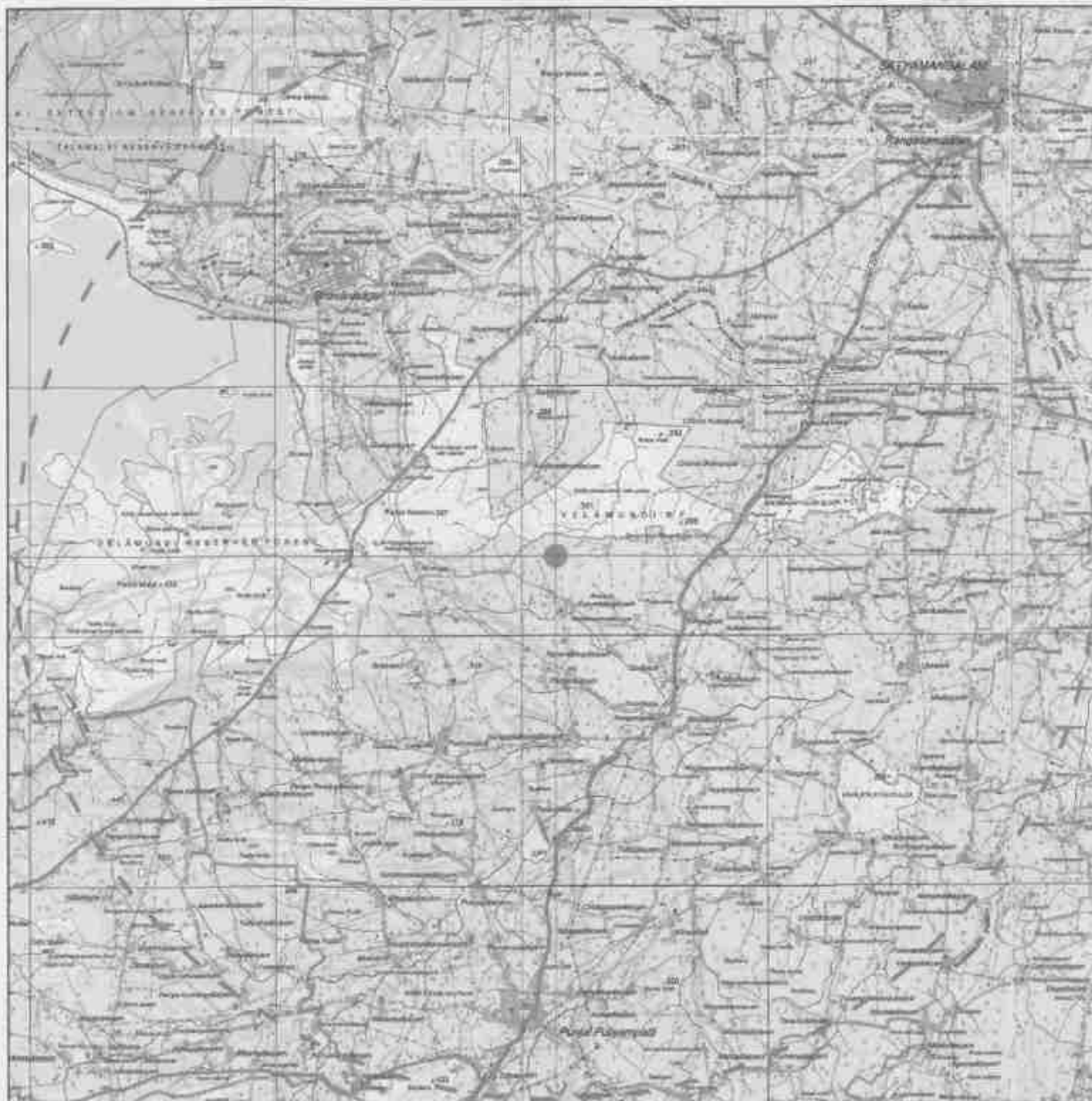
Self attested  




|   |  |
|---|--|
| Express highway; with toll; with bridge; with distance stone.....         |  |
| Roads metalled; according to importance.....                              |  |
| Roads, double carriageway; according to importance.....                   |  |
| Unmetalled road. Cart-track. Pack-track with pass. Foot-path.....         |  |
| Streams: with track in bed; undefined. Canal.....                         |  |
| Dams: masonry or rock-filled; earthwork. Weir.....                        |  |
| River; dry with water channel; with island & rocks. Tidal river.....      |  |
| Submerged rocks. Shoal. Swamp. Reeds.....                                 |  |
| Wells: lined; unlined. Tubewell. Spring. Tanks; perennial; dry.....       |  |
| Embankments: road or rail; tank. Broken ground.....                       |  |
| Railways, broad gauge: double; single with station; under constn.....     |  |
| Railways, other gauges: double; single with distance stone; do.....       |  |
| Mineral line or tramway. Kin. Cutting with tunnel.....                    |  |
| Contours with sub-features. Rocky slopes. Cliffs.....                     |  |
| Sand features: (1)flat. (2)sand-hills(permanent). (3)dunes(shifting)..... |  |
| Towns or Villages: inhabited; deserted. Fort.....                         |  |
| Huts: permanent; temporary. Tower. Antiquities.....                       |  |
| Temple. Chhatra. Church. Mosque. Idgah. Tomb. Graves.....                 |  |
| Lighthouse. Lightship. Buoys: lighted; unlighted. Anchorage.....          |  |
| Mine. Vine on trellis. Grass. Scrub.....                                  |  |
| Palms: palmyra; other. Plantain. Conifer. Bamboo. Other trees.....        |  |
| Areas: cultivated; Wooded. Surveyed trees.....                            |  |
| Boundary, international.....  |  |
| Boundary, state: demarcated; undemarcated.....                            |  |
| Boundary, district; subdivision; taluk or taluk; forest.....              |  |
| Boundary pillars: surveyed; unlocated.....                                |  |
| Heights, triangulated: station; point; approximate.....                   |  |
| Bench-mark: geodetic; tertiary; canal.....                                |  |
| Post office. Telegraph office. Overhead tank.....                         |  |
| Rest house or inspection bungalow. Circuit house. Police station.....     |  |
| Camping Ground. Forest: reserved; protected.....                          |  |
| Species names: administrative; locality or tribal.....                    |  |
| Hospital. Dispensary. Veterinary; Hospital/Dispensary.....                |  |
| Aerodrome. Helipad. Tourist site.....                                     |  |
| Powerline: with pylons surveyed; with poles unsurveyed.....               |  |

|           |           |           |
|-----------|-----------|-----------|
| 1:200     | 1:300     | 1:500     |
| 1:1000    | 1:2000    | 1:5000    |
| 1:10000   | 1:25000   | 1:50000   |
| 1:100000  | 1:250000  | 1:500000  |
| 1:1000000 | 1:2500000 | 1:5000000 |

11° 31' 20.22"N



77° 04' 37.96"E

77° 15' 48.76"E

11° 20' 25.86"N

TOPO SHEET NO. : 58 E/03

LATITUDE : 11°25'51.36"N to 11°25'55.19"N  
 LONGITUDE : 77°10'07.83"E to 77°10'18.95"E

10km RADIUS :

Q.L. APPLIED AREA :  79 A

**APPLICANT :**

Thiru.N.T. SAISADA,  
 S/o. THYAGARAJ,  
 No. 12, GANDHIJI 3<sup>rd</sup> STREET,  
 KARUR BYEPASS ROAD,  
 ERODE - 638 002.

**LOCATION OF QUARRY LEASE  
 APPLIED AREA:**

SF.Nos : 151(P),152/4,  
 EXTENT : 2.28.40 HA,  
 VILLAGE : KURUMBAPALAYAM,  
 TALUK : SATHYAMANGALAM,  
 DISTRICT : ERODE,  
 STATE : TAMILNADU.

**PLATE NO - I-A**

DATE OF SURVEY : 16.02.2024

**TOPO SKETCH OF QUARRY LEASE  
 APPLIED AREA FOR 10Km RADIUS**

SCALE. 1:1,00,000


**PREPARED BY :**
















THIS IS TO CERTIFY THAT THE INFORMATION IN THIS  
 PLATE IS TRUE AND CORRECT TO THE  
 BEST OF MY KNOWLEDGE BASED UPON THE LEASE MAP  
 AUTHENTICATED BY STATE GOVERNMENT

B. VENKATASUBRAMANIAN,  
 QUALIFIED PERSON

Under Rule 15(i)(c)and(b)of WCR,2018

**INDEX**




-  Q.L. APPLIED
-  1 Km RADIUS
-  500m RADIUS
-  SEASONAL AGRICULTURE LAND
-  TREES
-  HABITATION
-  QUARRY PIT & CRUSHER
-  WIND DIRECTION
-  PANCHAYAT ROAD
-  VILLAGE ROAD
-  EARTHEN ROAD
-  APPROACH ROAD
-  TANK & ODAI
-  BARREN LAND
-  RESERVE FOREST

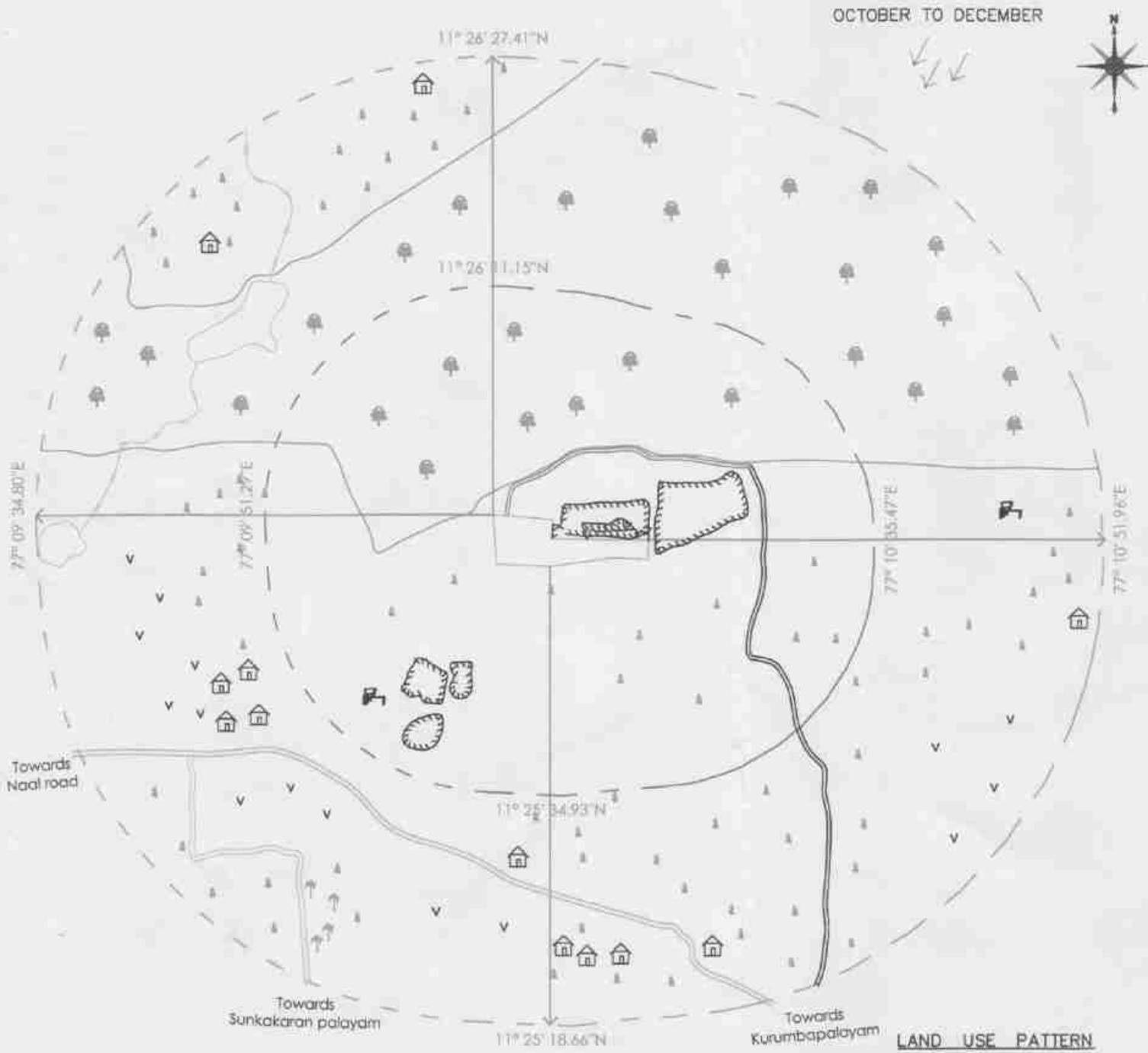
**APPLICANT :**  
 Thiru.N.T. SAISADA,  
 S/o. THYAGARAJ,  
 No. 12, GANDHIJI 3<sup>rd</sup> STREET,  
 KARUR BYEPASS ROAD,  
 ERODE - 638 002.

**LOCATION OF QUARRY**  
**LEASE APPLIED AREA:**  
 SF.Nos : 151(P),152/4,  
 EXTENT : 2,28.40 HA,  
 VILLAGE : KURUMBAPALAYAM,  
 TALUK : SATHYAMANGALAM,  
 DISTRICT : ERODE,  
 STATE : TAMILNADU.

**PLATE NO - I-B**  
 DATE OF SURVEY : 16.02.2024

**ENVIRONMENTAL & LAND USE**  
**PLAN**  
 SCALE: 1:10,000

**PREPARED BY :**  
 THIS IS TO CERTIFY THAT THE INFORMATION IN THIS  
 PLATE IS TRUE AND CORRECT TO THE  
 BEST OF MY KNOWLEDGE BASED UPON THE LEASE MAP  
 AUTHENTICATED BY STATE GOVERNMENT  
  
 V. VENKATASUBRAMANIAN  
 ASSISTANT DIRECTOR  
 Under Rule 13(1)(a) and (b) of MCR, 2018



OCTOBER TO DECEMBER

JULY TO SEPTEMBER

TOPO SHEET NO. : 58 E/03  
 LATITUDE : 11°25'51.36" N to 11°25'55.77" N  
 LONGITUDE : 77°10'07.83" E to 77°10'18.95" E

80 A








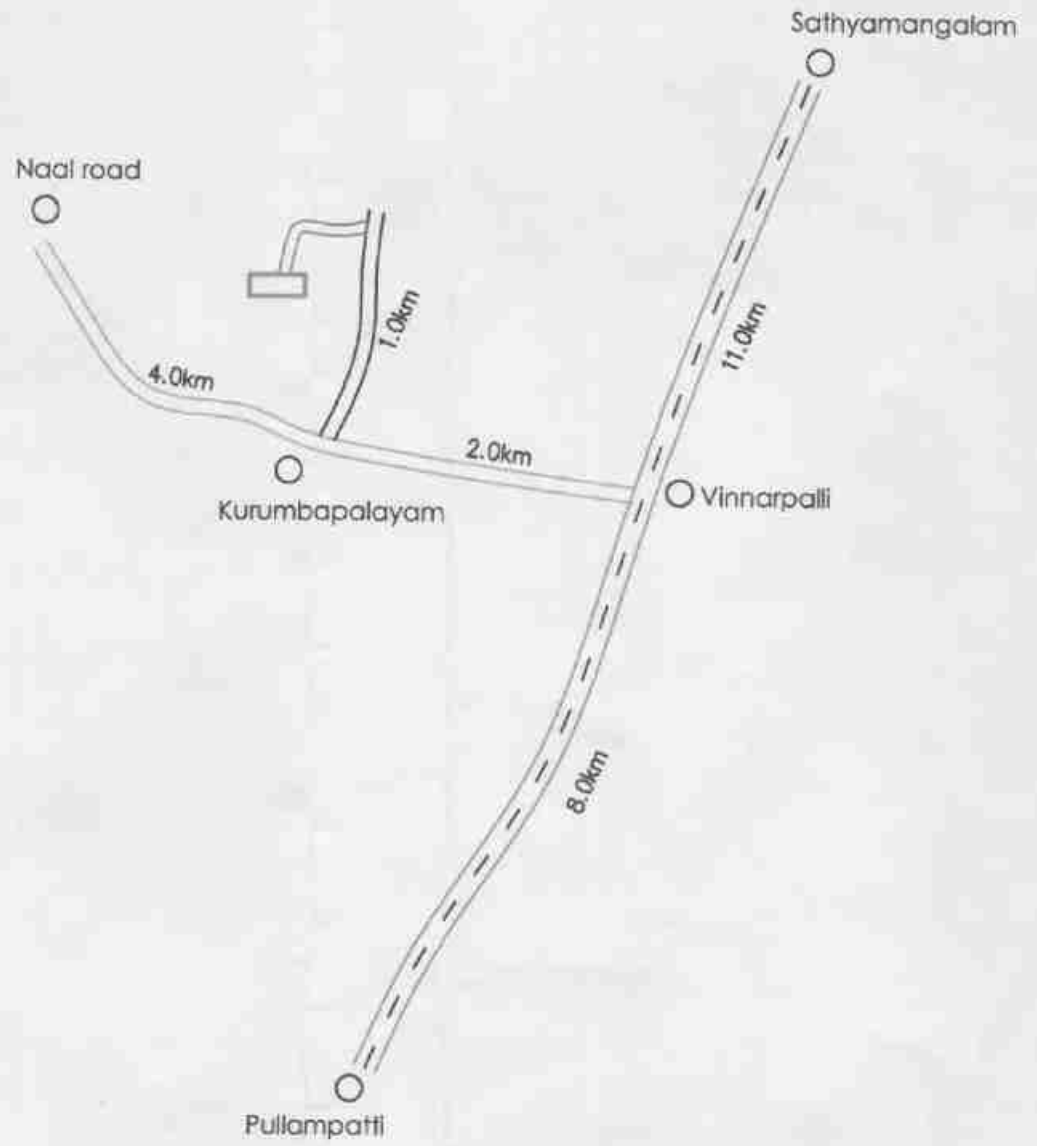
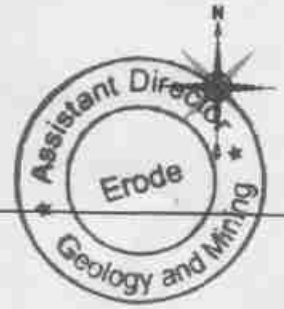
| DESCRIPTION               | PERCENTAGE | INDEX   |
|---------------------------|------------|---|
| QUARRY PITS&CRUSHER       | (07%)      |  |
| TREES                     | (09%)      |  |
| SEASONAL AGRICULTURE LAND | (22%)      |  |
| ROADS                     | (05%)      |  |
| HABITATION                | (06%)      |  |
| BARREN LAND               | (19%)      |  |
| RESERVE FOREST            | (32%)      |  |
| TOTAL                     | 100%       |   |

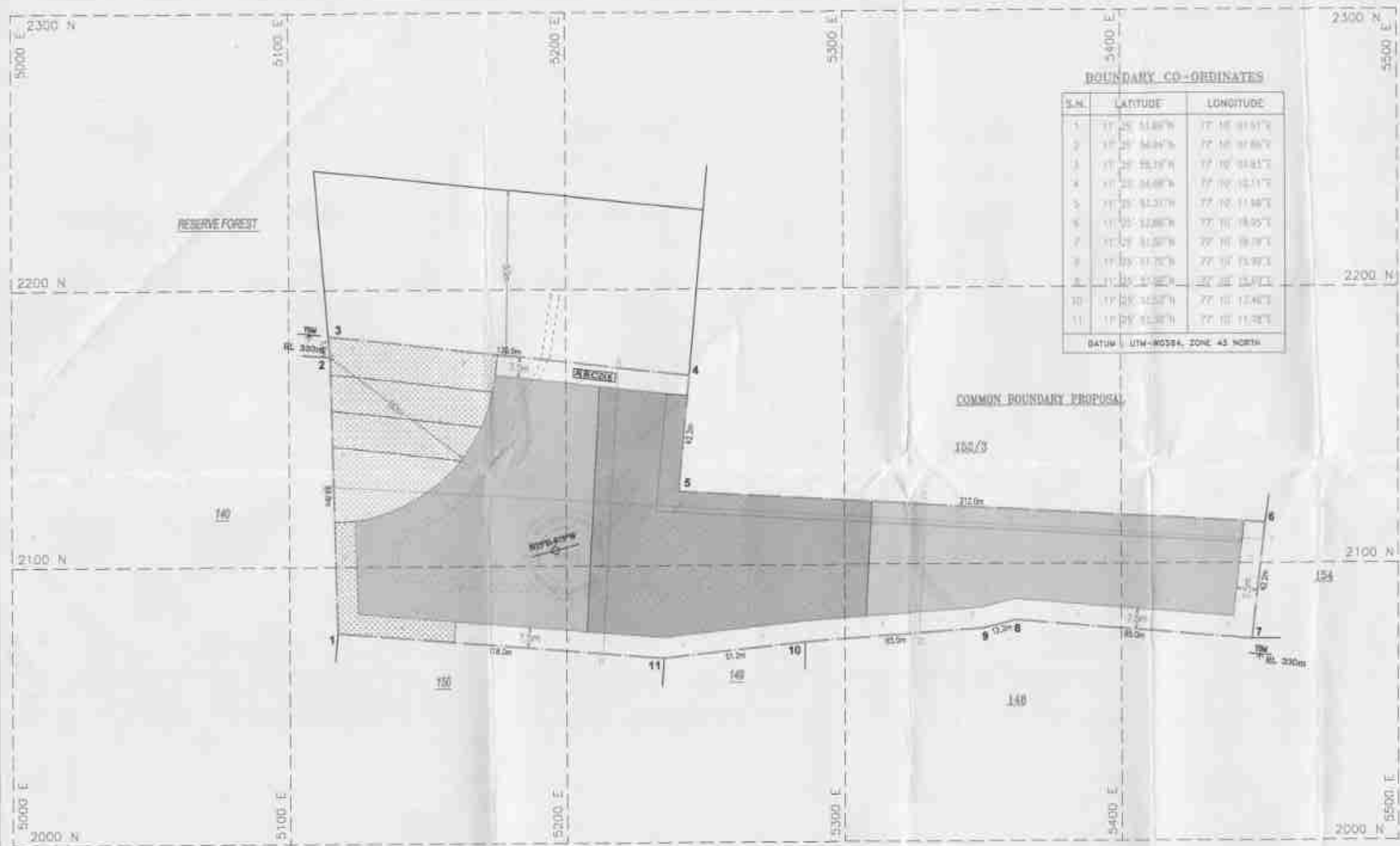


PLATE NO : I-C  
ROUTE MAP



|  |  |   |
|--|--|---|
| <p style="text-align: center;"><u>INDEX</u></p> <p>LEASE APPLIED AREA </p> <p>EARTHEN ROAD </p> <p>PANCHAYAT ROAD </p> <p>NH - ROAD </p> <p>APPROACH ROAD </p> | <p><u>APPLICANT :</u></p> <p>Thiru.N.T. SAISADA,<br/>S/o. THYAGARAJ,<br/>No. 12, GANDHIJI 3<sup>rd</sup> STREET,<br/>KARUR BYEPASS ROAD,<br/>ERODE - 638 002.</p>  | <p><u>SCALE :</u></p> <p style="text-align: center;">NOT TO SCALE</p>   |
|  | <p><u>LOCATION OF QUARRY LEASE APPLIED AREA:</u></p> <p>SF.Nos : 151(P),152/4,<br/>EXTENT : 2.28.40 HA,<br/>VILLAGE : KURUMBAPALAYAM,<br/>TALUK : 81A VYAMANGALAM,<br/>DISTRICT : ERODE,<br/>STATE : TAMILNADU</p> | <p><u>PREPARED BY:</u></p> <p style="text-align: center;"> <br/>             B. VENKATARAJ, B.Sc.,<br/>             QUALIFIED PERSON<br/>             Under Rule 15(i)(a) and (b) of MCR, 2016         </p> |

THIS IS TO CERTIFY THAT THE INFORMATION IN THIS PLATE IS TRUE AND CORRECT TO THE BEST OF MY KNOWLEDGE BASED UPON THE LEASE MAP AUTHENTICATED BY STATE GOVERNMENT



**BOUNDARY CO-ORDINATES**

| S.N. | LATITUDE         | LONGITUDE        |
|------|------------------|------------------|
| 1    | 17° 25' 51.807"N | 77° 16' 31.617"E |
| 2    | 17° 25' 54.975"N | 77° 16' 31.667"E |
| 3    | 17° 25' 55.179"N | 77° 16' 34.817"E |
| 4    | 17° 25' 54.879"N | 77° 16' 35.117"E |
| 5    | 17° 25' 52.379"N | 77° 16' 31.967"E |
| 6    | 17° 25' 52.879"N | 77° 16' 34.017"E |
| 7    | 17° 25' 51.279"N | 77° 16' 31.917"E |
| 8    | 17° 25' 51.279"N | 77° 16' 31.917"E |
| 9    | 17° 25' 51.279"N | 77° 16' 31.917"E |
| 10   | 17° 25' 51.279"N | 77° 16' 31.917"E |
| 11   | 17° 25' 51.279"N | 77° 16' 31.917"E |

BATUM UTM-ZONE 48 NORTH

**PLATE NO-III**  
DATE OF SURVEY : 16.02.2024

**APPLICANT**  
THIRU.KT. SAGADA,  
S/O. VIYAGARAJ,  
NO. 12, GANDHI 3<sup>RD</sup> STREET,  
KARUR BYPASS ROAD,  
ERODE - 638 002.

**LOCATION OF QUARRY LEASE APPLIED AREA:**  
SP. NO. : 151(P)-152/4,  
EXTENT : 2.28.40 HA,  
VILLAGE : KURUMBAPALAYAM,  
TALUK : SATHYAMANGALAM,  
DISTRICT : ERODE,  
STATE : TAMILNADU.

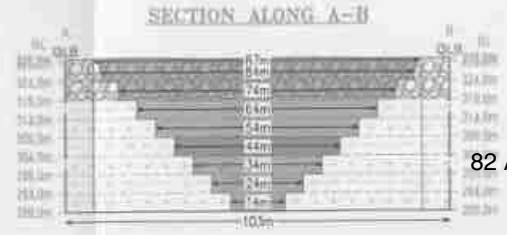
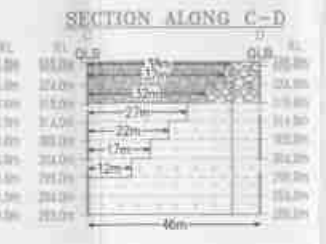
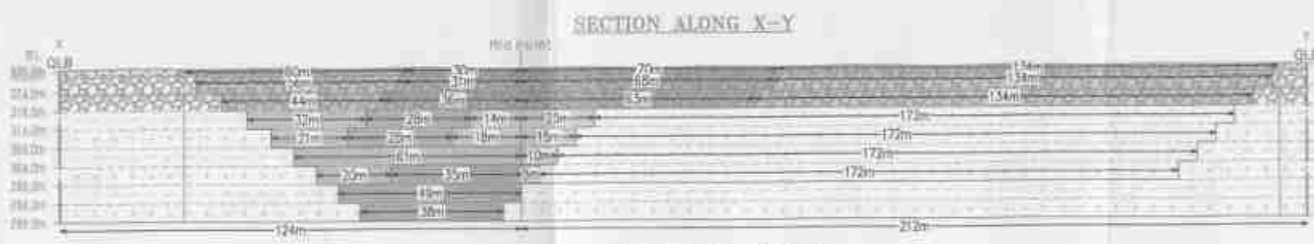
**INDEX**

|                            |  |
|----------------------------|--|
| Q.L. APPLIED AREA BOUNDARY |  |
| 7.5m & 40m SAFETY DISTANCE |  |
| TEMPORARY BENCH MARK       |  |
| APPROACH ROAD              |  |
| GRAVEL                     |  |
| WEATHERED ROCK             |  |
| SCRUB                      |  |
| ROUGH STONE                |  |
| STRIKE & DIP               |  |
| QUARRY ROAD                |  |

**TOPOGRAPHY, GEOLOGICAL, YEARWISE DEVELOPMENT & PRODUCTION PLAN & SECTIONS**  
SCALE 1 : 1000  
(5-Y YEAR)

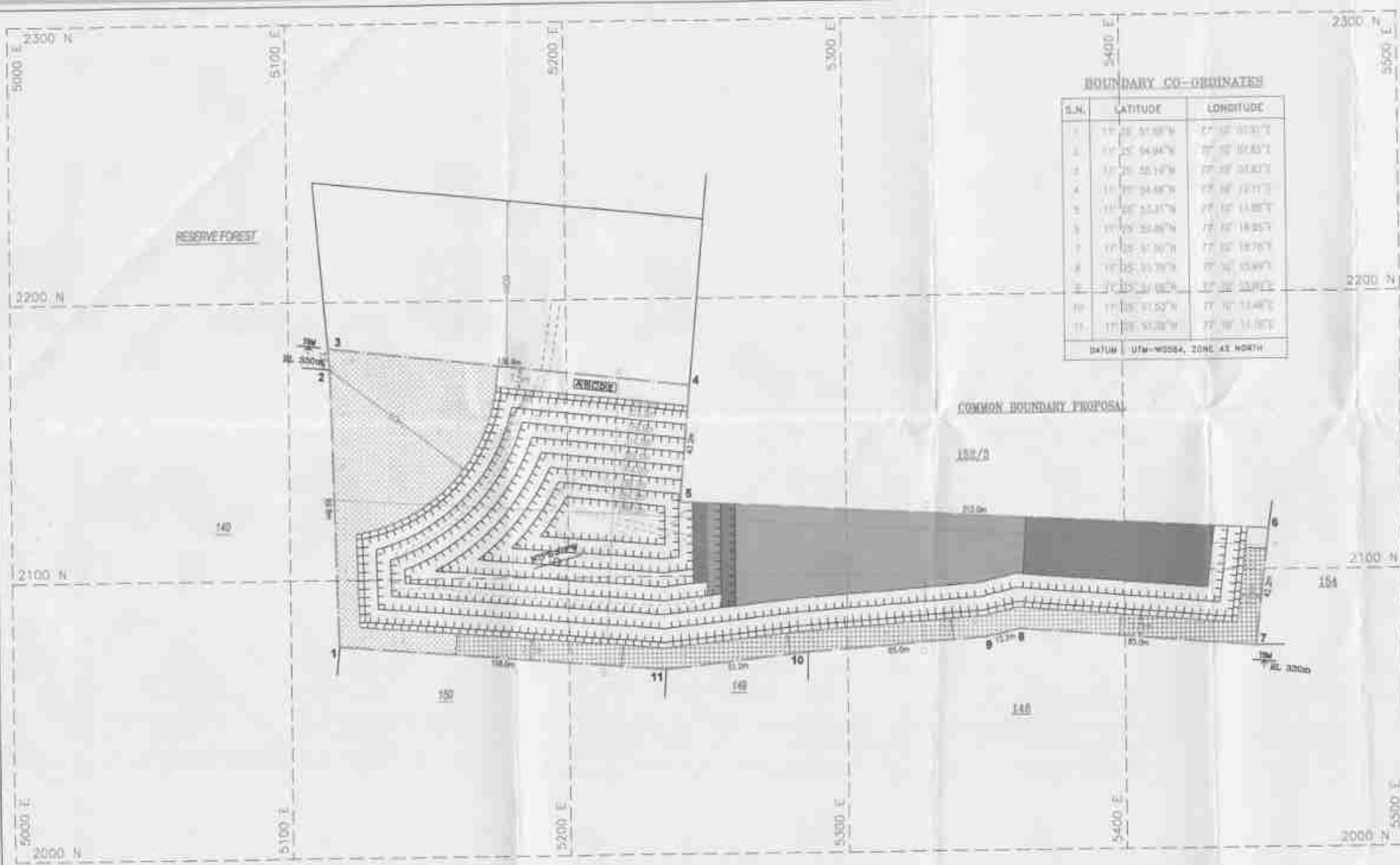
**PREPARED BY :**

THIS IS TO CERTIFY THAT THE INFORMATION IN THIS PLAN IS TRUE AND CORRECT TO THE BEST OF MY KNOWLEDGE BASED UPON THE DATA AND SURVEYING INSTRUMENTS AVAILABLE TO ME.  
*(Signature)*  
S. SATHYANARAYANAN  
2024/02/16



**SOIL SYMBOLS**  
(Proposed)  
S-1 (S1) - 400  
S-2 (S2) - 400  
S-3 (S3) - 400  
S-4 (S4) - 400  
S-5 (S5) - 400

|                  |  |                  |  |
|------------------|--|------------------|--|
| 1 Yr. EXCAVATION |  | 1 Yr. PLANTATION |  |
| 2 Yr. EXCAVATION |  | 2 Yr. PLANTATION |  |
| 3 Yr. EXCAVATION |  | 3 Yr. PLANTATION |  |
| 4 Yr. EXCAVATION |  | 4 Yr. PLANTATION |  |
| 5 Yr. EXCAVATION |  | 5 Yr. PLANTATION |  |



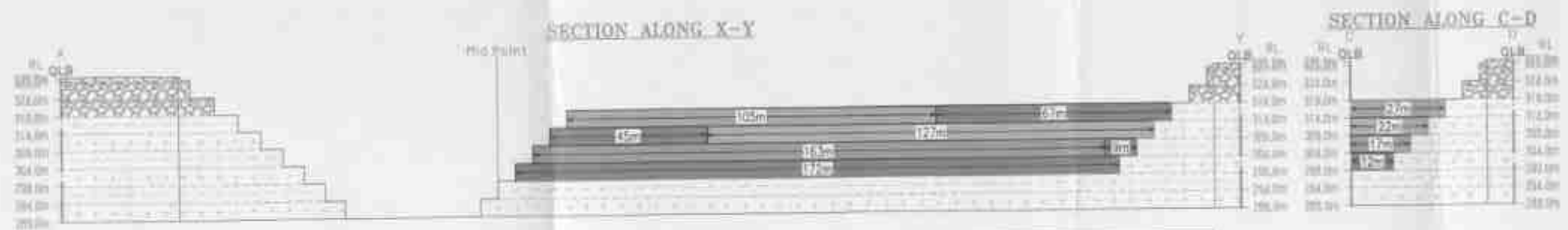
**PLATE NO-III-A**  
 DATE OF SURVEY : 16.02.2024

**APPLICANT :**  
 THIRU.N. SABADA,  
 S/O. DHYAGARA,  
 NO. 12, GANDHI 3RD STREET,  
 KARUR BYPASS ROAD,  
 TRODE - 638 002.

**LOCATION OF QUARRY LEASE APPLIED AREA:**  
 SF.No : 151(P),192/4,  
 EXTENT : 2.28.40 HA,  
 VILLAGE : KURUMPALAYAM,  
 TALUK : SATHYANAGALAM,  
 DISTRICT : TRODE,  
 STATE : TAMILNADU.

**INDEX**

|                            |          |
|----------------------------|----------|
| Q.L. APPLIED AREA BOUNDARY | [Symbol] |
| 7.5m & 50m SAFETY DISTANCE | [Symbol] |
| TEMPORARY BENCH MARK       | [Symbol] |
| APPROACH ROAD              | [Symbol] |
| GRAVES                     | [Symbol] |
| WEATHERED ROCK             | [Symbol] |
| SCRUB                      | [Symbol] |
| ROUGH STONE                | [Symbol] |
| STRIKE & DIP               | [Symbol] |
| QUARRY PIT                 | [Symbol] |
| QUARRY ROAD                | [Symbol] |



1st Year Proposed Pit Dimensions(Max)  
 29m(L)X8m(W)X4m(D)

**USE SURVEYS**

|                |
|----------------|
| A-OFFICE       |
| B-2ND AND ROOM |
| C-TOILET       |
| D-REST SHED    |
| E-TOILET       |

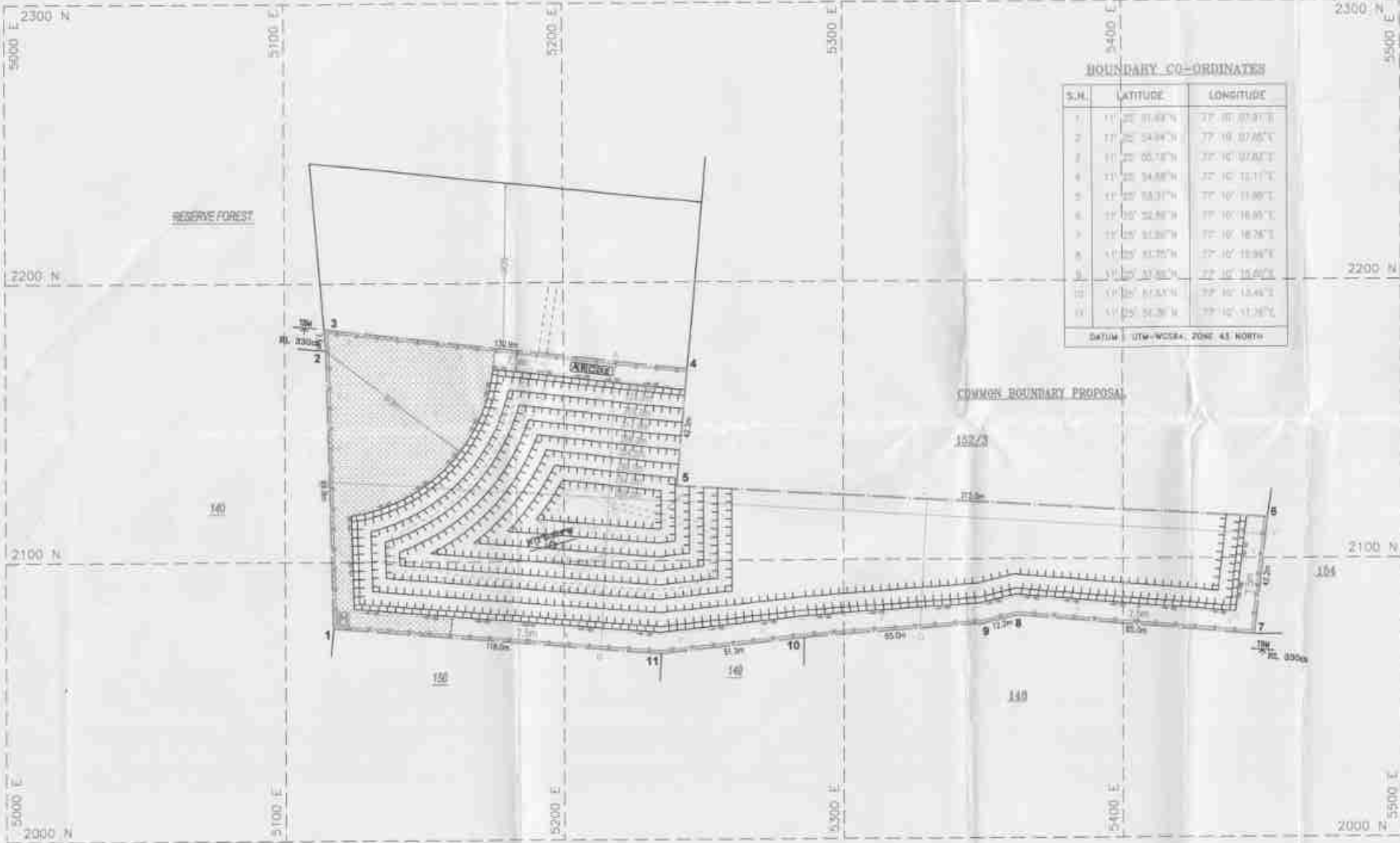
| I-V Yr PLANTATION |                   |
|-------------------|-------------------|
| I Yr EXCAVATION   | I Yr PLANTATION   |
| II Yr EXCAVATION  | II Yr PLANTATION  |
| III Yr EXCAVATION | III Yr PLANTATION |
| IV Yr EXCAVATION  | IV Yr PLANTATION  |
| V Yr EXCAVATION   | V Yr PLANTATION   |

**TOPOGRAPHY, GEOLOGICAL, YEARWISE DEVELOPMENT & PRODUCTION PLAN & SECTIONS**  
 SCALE 1:1000  
 (VS-X YEAR)

**PREPARED BY :**

THE S.O. TO VERIFY THAT THE INFORMATION IN THIS PLATE IS TRUE AND CORRECT TO THE BEST OF HIS KNOWLEDGE OBTAINED FROM THE LEGAL AND AUTHENTIC DOCUMENTS AND FIELD SURVEY.

*[Signature]*  
 S.O. SURVEYS  
 KARUR DISTRICT  
 KARUR, TAMILNADU - 638 002



**BOUNDARY CO-ORDINATES**

| S.N. | LATITUDE        | LONGITUDE       |
|------|-----------------|-----------------|
| 1    | 11° 20' 31.48"N | 77° 10' 37.91"E |
| 2    | 11° 20' 34.94"N | 77° 10' 37.65"E |
| 3    | 11° 20' 05.18"N | 77° 10' 37.63"E |
| 4    | 11° 20' 34.88"N | 77° 10' 35.17"E |
| 5    | 11° 20' 58.37"N | 77° 10' 33.80"E |
| 6    | 11° 20' 32.87"N | 77° 10' 33.93"E |
| 7    | 11° 20' 31.30"N | 77° 10' 33.75"E |
| 8    | 11° 20' 33.75"N | 77° 10' 33.94"E |
| 9    | 11° 20' 37.95"N | 77° 10' 35.67"E |
| 10   | 11° 20' 37.33"N | 77° 10' 35.64"E |
| 11   | 11° 20' 34.30"N | 77° 10' 33.70"E |

DATUM : UTM-WGS84, ZONE 45 NORTH

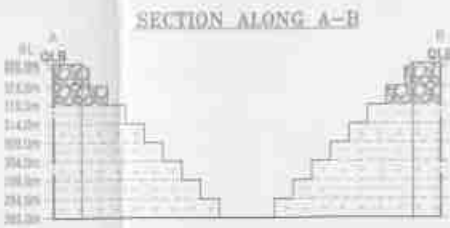
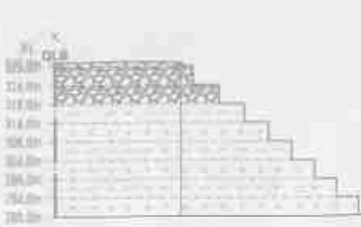
**PLATE NO-IV**  
DATE OF SURVEY : 16.02.2024

**APPLICANT :**  
THRU M.T. SABADA,  
S/O. DHYAGARAJ,  
No. 12, GANDHIL 2<sup>ND</sup> STREET,  
KARGU BYPASS ROAD,  
ERICIDE - 638 002.

**LOCATION OF QUARRY LEASE APPLIED AREA:**  
SP.No. : 151(P), 152/4,  
EXTENT : 2.28.40 HA,  
VILLAGE : KURUMBAPALAYAM,  
TALEUK : SATHYAMANGALAM,  
DISTRICT : ERICIDE,  
STATE : TAMILNADU.

**INDEX**

|                            |  |
|----------------------------|--|
| Q.L. APPLIED AREA BOUNDARY |  |
| 7.5m & 60m SAFETY DISTANCE |  |
| TEMPORARY BENCH MARK       |  |
| APPROACH ROAD              |  |
| GRAVEL                     |  |
| WEATHERED ROCK             |  |
| SCRUB                      |  |
| ROUGH STONE                |  |
| STRIKE & DIP               |  |
| QUARRY PIT                 |  |
| QUARRY ROAD                |  |
| BARBED WIRED FENCING       |  |
| PROPOSED GARLAND DRAIN     |  |



Proposed Pit Dimension(Mm)  
294m(L)x87m(W)x41m(D)

**SITE SERVICES**

|                  |
|------------------|
| A-OFFICE         |
| B-FINCT AND ROOM |
| C-STONE          |
| D-REST AREA      |
| E-TOILET         |

**I-V Yr PLANTATION**

**PRESENT & POST LAND USE PATTERN**

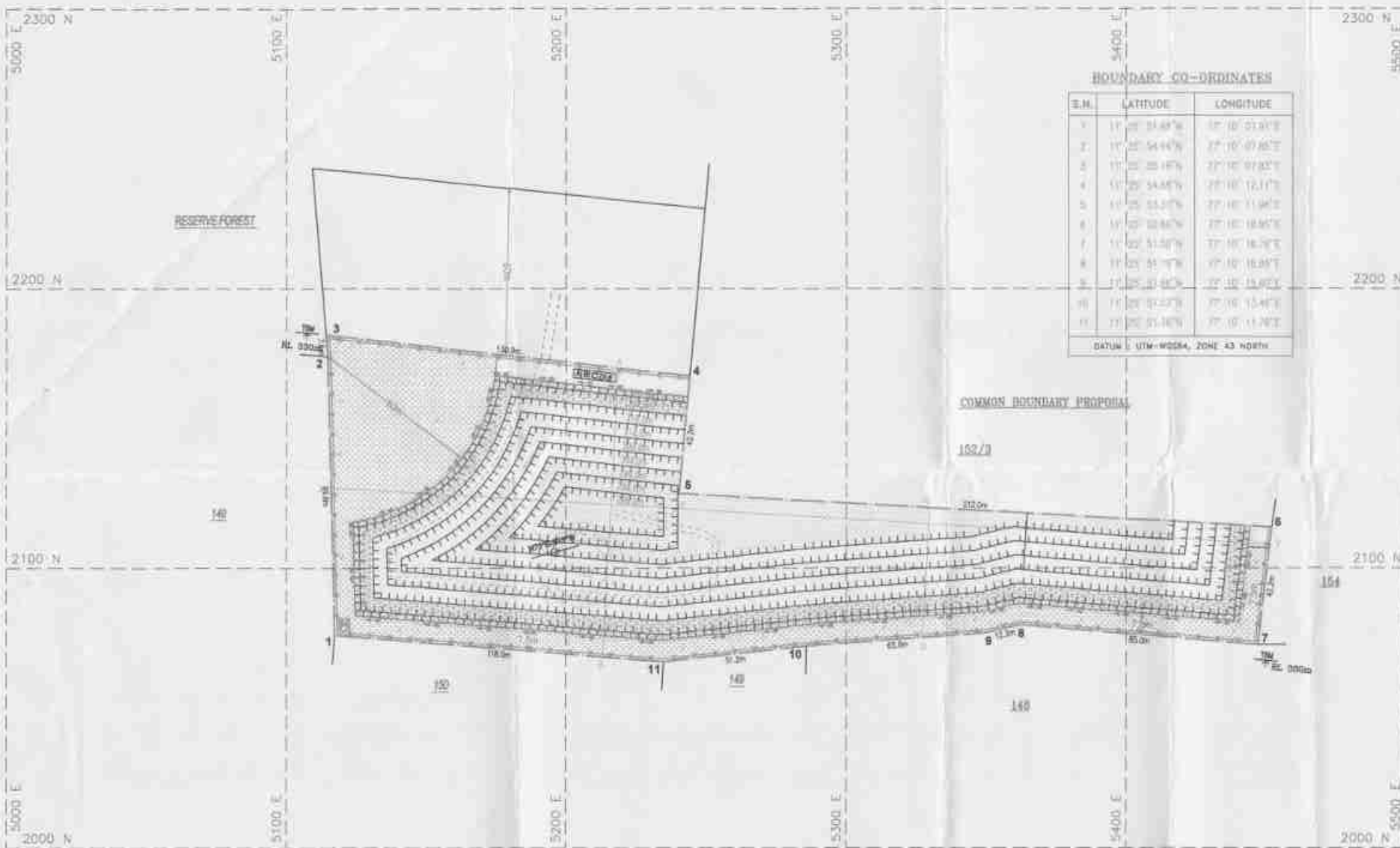
| DESCRIPTION        | PRESENT AREA (Ha) | ADDITIONAL AREA REQUIRED DURING THE MINING PLAN(Ha) | AREA AT THE END OF THIS QUARRYING PERIOD (Ha) |
|--------------------|-------------------|---|---|
| AREA UNDER QUARRY  | Nil               | 1.82.48   | 1.82.48                                       |
| INFRASTRUCTURE     | Nil               | 2.01.00   | 0.01.20                                       |
| ROADS              | Nil               | 0.22.00   | 0.22.00                                       |
| GREEN BELT         | Nil               | 0.19.00   | 0.28.85                                       |
| UN-UTILISED AREA   | 2.28.40           | 0.24.99   | 0.29.37                                       |
| <b>GRAND TOTAL</b> | <b>2.28.40</b>    | <b>2.28.40</b>                                      | <b>2.28.40</b>                                |

**PROGRESSIVE QUARRY CLOSURE PLAN & SECTIONS**

SCALE: 1:1000

**PREPARED BY :**  
THIS IS TO CERTIFY THAT THE INFORMATION IN THIS PLAN IS TRUE AND CORRECT TO THE BEST OF MY KNOWLEDGE BASED UPON THE LEGAL MAP AUTHENTICATED BY STATE GOVERNMENT.

SURVEYOR  
REGD. NO. 15023/2019/2019



**BOUNDARY CO-ORDINATES**

| S.N. | LATITUDE        | LONGITUDE       |
|------|-----------------|-----------------|
| 1    | 11° 20' 51.69"N | 77° 10' 01.91"E |
| 2    | 11° 21' 54.44"N | 77° 10' 07.85"E |
| 3    | 11° 21' 55.16"N | 77° 10' 07.85"E |
| 4    | 11° 20' 54.65"N | 77° 10' 12.17"E |
| 5    | 11° 20' 53.27"N | 77° 10' 11.96"E |
| 6    | 11° 20' 52.86"N | 77° 10' 12.95"E |
| 7    | 11° 20' 51.48"N | 77° 10' 14.78"E |
| 8    | 11° 20' 51.47"N | 77° 10' 16.89"E |
| 9    | 11° 20' 51.48"N | 77° 10' 16.89"E |
| 10   | 11° 20' 51.47"N | 77° 10' 15.47"E |
| 11   | 11° 20' 51.48"N | 77° 10' 11.96"E |

DATUM : UTM-WGS84, ZONE 43 NORTH

**PLATE NO-V**  
DATE OF SURVEY : 16.02.2024

**APPLICANT :**  
THIRUNJ. SARADA,  
S/O. THIYAGARAJ,  
No. 12, GANDHJI 3<sup>RD</sup> STREET,  
EARLIER BYPASS ROAD,  
ERODE - 638 002.

**LOCATION OF QUARRY LEASE APPLIED AREA:**  
Sf.No. : 131(W), 152/4,  
EXTENT : 2.38 40 HA,  
VILLAGE : KURUMBAPALAYAM,  
TALUK : SAHYAMANGALAM,  
DISTRICT : ERODE,  
STATE : TAMILNADU.

**INDEX**

- QLL APPLIED AREA BOUNDARY
- 7.5m & 60m SAFETY DISTANCE
- TEMPORARY BENCH MARK
- APPROACH ROAD
- GRAVEL
- WEATHERED ROCK
- SCRUB
- STRIKE & DIP
- QUARRY PIT
- QUARRY ROAD
- EXISTING LANDFORM
- OLD SURFACE LEVEL
- FINISHED SURFACE LEVEL
- RAIN WATER STORAGE
- REHABILITATED LANDFORM
- BARBED WIRED FENCING
- PROPOSED GARLAND DRAIN
- TREES



**SOIL DETAILS**

- A - OFFICE
- B - FRESH AIR WOOD
- C - STRONG
- D - HARDY (HARD)
- E - TENDER

Ultimate Pit Dimension/Max  
294m(L)X87m(W)X41m(D)

X-Y PLANTION

**CONCEPTUAL PLAN & SECTIONS**  
SCALE: 1:1500

**PREPARED BY :**

THIS IS TO CERTIFY THAT THE INFORMATION IN THIS PLAN IS TRUE AND CORRECT TO THE BEST OF MY KNOWLEDGE BASED UPON THE FIELD MAP AUTHENTICATED BY THE GOVERNMENT.

**REGISTERED PROFESSIONAL**  
SARADA S/O THIYAGARAJ  
No. 12, GANDHJI 3<sup>RD</sup> STREET,  
EARLIER BYPASS ROAD,  
ERODE - 638 002.

# Hydrogeological Report

## Rough Stone and Gravel Quarry

Over an extent of 2.28.40Ha of Patta lands in S.F.Nos. 151 (Part)  
and 152/4 of Kurumbapalayam Village, Sathyamangalam Taluk,

Erode District, Tamil Nadu State

*M. Logan*

**Hydrogeological Report for Kurumbapalayam**  
**Rough Stone and Gravel Quarry**

**1. INTRODUCTION**

**NAME OF THE APPLICANT WITH ADDRESS-**

**Name of the applicant** : **Thiru. N.T. Saisada,**  
S/o. Thyagaraj,  
**Address** : No. 12, Gandhiji 3<sup>rd</sup> Street,  
Karur bypass, Erode District,  
**State with Pin Code** : Tamil Nadu – 638 002.  
**Mobile No** : +91 99866 00066  
**Aadhaar No** : 8469 1057 5795  
**E-mail** : ntsaisada@gmail.com

**DETAILS OF THE AREA-**

**Land Classification** : Patta land  
**Survey No** : 151 (Part) and 152/4  
**Extent** : 2.28.40Ha  
**Village** : Kurumbapalayam  
**Taluk** : Sathyamangalam  
**District** : Erode

The Client requires detailed information on ground water occurrences at proposed project site of Rough Stone and Gravel quarry. The objective of the present study is to assess the availability of groundwater and comment on aspects of depth to potential aquifers, aquifer availability and type, possible yields and water quality. For this purpose, all available hydrogeological information of the areas has been analyzed, and a geophysical survey was done.

The investigations involved hydrogeological, geophysical field investigations and a detailed study in which the available relevant geological and hydrogeological data were collected, analyzed, collated and evaluated within the context of the Client's requirements. The data sources consulted were mainly:

- a) Central Ground Water Board (CGWB) Data
- b) State & District Geological and Hydrogeological Reports and Maps.
- c) Technical reports of the area by various organizations.

*N.T. Saisada*

## **2. SCOPE OF THE WORKS –**

The scope of works includes:

- ❖ Site visits to familiarize with the project areas. Identify any issues that might impact the Ground Water Scenario due to proposed mining activities.
- ❖ To obtain, study and synthesize background information including the geology, hydrogeology and existing borehole data, for the purpose of improving the quality of assessment and preparing comprehensive hydrogeological reports,
- ❖ To carry out hydrogeological evaluation and geophysical investigations in the selected sites in order to determine potential for groundwater at project site.
- ❖ To prepare hydrogeological survey reports in conformity with the provisions of the rules and procedure outlined by the Central Ground Water Board (CGWB), by Assessment of water quality and potential infringement of National standards, Assessment of availability of groundwater and Impact of proposed activity on aquifer, water quality and other abstractors.

## **3. BACKGROUND INFORMATION**

### **Geographical information of the study area-**

The investigated site falls in the Toposheet No: **58 E/03** Latitude between: 11°25'51.36"N to 11°25'55.19"N and Longitude between 77°10'07.83"E to 77°10'18.95"E on WGS datum-1984.

### **GEOMORPHOLOGY**

The Erode district forms part of the uplands of the state. Physiographically the district can be divided into hilly area, the upland area and plains area. The prominent geomorphic units identified in the district 1) Structural hills, 2) Inselberg, 3) Ridges, 4) Valley fill, 5) Pediments, 6) Shallow Pediments,

The hilly area is represented by the Western Ghats in the northwestern part of the district, the BiligiriRangan hills in the north, BodamalaiBetta hills in the northwestern parts and Konbattarayan hills in the north central part of the district. Konbattarayan hill (1699 m above MSL) is the highest peak in the district while Moyar Gorge is a picturesque gorge in the WesternGhats through which Moyar river traverses.

The Kongunadu uplands lie south of Bhavaniriver and the Lower Bhavani canal passes through these uplands. Scattered hillocks and knolls of moderate elevations occur within these uplands. The plains area is characterised by an undulating topography with a general

*MS. Logan*



gradient due east and southeast. The plains are limited to the east and southwestern border of the district. The plains west of Cauvery river are known as Lower Cauvery plains.

### **Soils**

The soils of Erode district can be broadly classified into 6 major soil types viz., Redcalcareous soil, Red non calcareous soil, Black Soil, Alluvial and Colluvialsoils, Brown soil and Forest soil. Major part of the district covered by red calcareous soils.

They are mostly sandy to loamy and characterised by the hard and compact layer of lime. The red non-calcareous soils are seen in Erode, Perunthurai and Gopichettioalayamtaluks. The black soils are occurring as patches in four taluks. Brown soil occupies only a small portion of Bhavani, Kangayam and Gopichettipalayamtaluks. Alluvial soils are found in small patches along the Noyil and Bhavani rivers and the Colluvial soils are found in the foothills of Western Ghats. Forest soil is confined to the reserve forest area in northwestern part of the district, where a surface layer of organic matter is present.

### **Rainfalls**

The district receives the rain under the influence of both southwest and northeast monsoons. The northeast monsoon chiefly contributes to the rainfall in the district. The southwest monsoon is also reasonable. During the winter and hot seasons, the rainfall is scanty.

The normal annual rainfall over the district varies from about 575 mm to about 833mm. It is the minimum in the southern and southeastern parts of the district around Kodumudi (575.3 mm) Mulanur (581.0 mm) and Dharapuram (593.0 mm). It gradually increases towards north and northwest and reaches a maximum around Talavadi (833 mm).

### **Climate**

The western part of the Erode district enjoys a salubrious climate because of the hilly region, whereas the central and eastern parts of the district are hot and humid. The cooler and pleasant climate prevails in the hilly regions. The weather is extremely pleasant during the period from November to February both in the plains and on the hills. Mornings in general are more humid than the afternoons. The relative humidity varies from 65 to 87 percent during the northeast monsoon period between October and November.

The hot weather begins early in March, the highest temperature being reached in April and May. Highest temperatures are recorded during the months of April and May with temperatures reaching 40°C. The weather in the plains during the summer i.e., from April to June is generally dry and hot. Weather cools down progressively from about the middle of June and by December. The night temperatures are the lowest in the hills.

*N.S. Logan*

## 1. GEOLOGY

The rock types exposed in the Erode district can be broadly grouped as

- 1) Granulite group of rocks
- 2) Migmatite Complex
- 3) Sathyamangalam Schist Complex
- 4) Peninsular Gneissic Complex
- 5) Alkali Complex
- 6) Acid Intrusives
- 7) Quaternary Alluvium.

The Granulite group of rocks comprise of Calc Granulite, Quartzite of Khondalite group, Charnockite, Pyroxene Granulite, Pyroxenite of Charnockite group, Migmatite gneiss, and Metagabbro. Charnockite occurs as a major rock type in the northern part and as thin bands and enclaves in the southern part of the district. Quartzite and Calc Granulite, Pyroxene Granulite, Migmatite Gneiss occurs as thin bands and enclaves.

Hornblende gneiss, Garnetiferous - Quartzofeldspathic gneiss and granite are the important rock types of Migmatite Complex, of which, hornblende gneiss occupies the major part of the District, particularly in southern part and northwestern part. Garnetiferous quartzofeldspathic gneiss is located near Bhavani Sagar reservoir and north of Anthiyur.

The Sathyamangalam Group includes fuchsite Quartzite, schistose-quartzite, sillimanite-quartzite, ferruginous Quartzite, talc-tremolite / Actinolite schist / hornblende schist, Amphibolite and Gabbro-anorthosite and Pyroxenite. Schistose rocks occur as enclaves near Sathyamangalam, west of Chennimalai. Quartzite occurs as thin beds near Kavilanattam, west of Chennimalai, Amphibolite occur as enclaves near Sathyamangalam, Gobi and around Perudnurai. A north site, Pyroxenite occurs as WSW-ENE trending bands in fissile hornblende gneiss of PGC (Bhavani Group) which occupies the ventral part of the district.

Granite bodies are located in the central part of the district around Punjai Puliyampatti and west of Erode. Quaternary fluvial deposits are restricted to the river beds of Cauveri, Noyyal, Amaravathi and Bhavani rivers.

The plains show a large number of ultramafic bodies along the E-W Bhavani lineament. WNW-ESE to NW-SE trending dykes is a common feature. The Cauveri River which has a

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NNE-SSW trending straight course between Mettur and Bhavani is considered to represent a major lineament, probably a deep seated fault zone.

The general E-W to ENE-WSW course of the Bhavani River flowing at the foot of the hills indicates a major lineament, probably a deep seated fault zone.

The Moyyar - Bhavani, Noyyil - Cauveri lineaments belong to the NNW-SSE to E-W system. The Mettur fault is a NNE-SSW system. The N-S to NNE-SSW trending dykes show clear truncation against the E-W Bhavani lineament.

#### Stratigraphy of Erode district

| Lithology   | Group                                  | Age                     |
|---|--|-------------------------|
| Soil Alluvium   |  | Holocene                |
| Laterite  |  |                         |
| Kankar  |  |                         |
| Granite   | Acid intrusive                         | Proterozoic             |
| Dolerite dyke / Meta dolerite / Basic intrusive                                       |  |                         |
| Nephelenesyenite Corundumsyenite  | Alkaline complex                       |                         |
| Pink migmatite  | Penninsular gneissic complex (Bhavani) | Proterozoic to Archaean |
| Fisshile Hornblende biotite gneiss  |  |                         |
| Gabbro, anorthosite, pyroxenite   |  |                         |
| Amphibolite   | Sathyamangalam Group                   |                         |
| Talc - tremolite / Actinolite schist / Hornblende schist                              |  |                         |
| Fuchsite quartzite, schistose quartzite, Sillimanite quartzite, ferruginous quartzite |  |                         |
| Hornblende biotite gneiss   |  |                         |
| Gametiferous-Quartzofeldspathic gneiss  | Migmatite Complex                      | Archaean                |
| Metagabbrophrozenite  | Charnockite Group                      |                         |
| Magnetite quartzite   |  |                         |
| Pyroxene granulite  |  |                         |
| Charnockite   |  |                         |
| Calc granulite  | Khondalite Group                       |                         |
| Quartzite Anorthosite located in wellcuttings   |  |                         |

*MS. Logan*

## **5.GEOPHYSICAL INVESTIGATION METHODS**

A variety of methods are available to assist in the assessment of geological sub-surface conditions. The main emphasis of the fieldwork undertaken was to determine the thickness and composition of the sub-surface formations and to identify water-bearing zones. This information was principally obtained in the field using, and vertical electrical soundings (VES). The VES probes the resistivity layering below the site of measurement. This method is described below.

### **Resistivity Method**

Vertical electrical soundings (VES) were carried out to probe the condition of the sub-surface and to confirm the existence of deep groundwater. The VES investigates the resistivity layering below the site of measurement.

### **Basic Principles**

The electrical properties of rocks in the upper part of the earth's crust are dependent upon the lithology, porosity, and the degree of pore space saturation and the salinity of the pore water. Saturated rocks have lower resistivity than unsaturated and dry rocks. The higher the porosity of the saturated rock, or the higher the salinity of the saturating fluids, the lower is the resistivity. The presence of clays and conductive minerals also reduces the resistivity of the rock.

The resistivity of earth materials can be studied by measuring the electrical potential distribution produced at the earth's surface by an electric current that is passed through the earth. Current is moved through the subsurface from one current electrode to the other and the potential difference is recorded as the current passes. From this information, resistivity values of various layers are acquired and layer thickness can be identified.

The apparent resistivity values determined are plotted as a log function versus the log of the spacing between the electrodes. These plotted curves identify thickness of layers. If there are multiple layers (more than 2), the acquired data is compared to a master curve to determine layer thickness.

This method is least influenced by lateral in-homogeneities and capable of providing higher depth of investigation.

The resistance R of a certain material is directly proportional to its length L and cross-sectional area A, expressed as:

$$R = R_s * L/A \text{ (in Ohm)}$$

*MS. 10/1/2000*

Where  $R_s$  is known as the specific resistivity (characteristic of the material and independent of its shape or size)

With Ohm's Law,

$$R = dV/I \text{ (Ohm)}$$

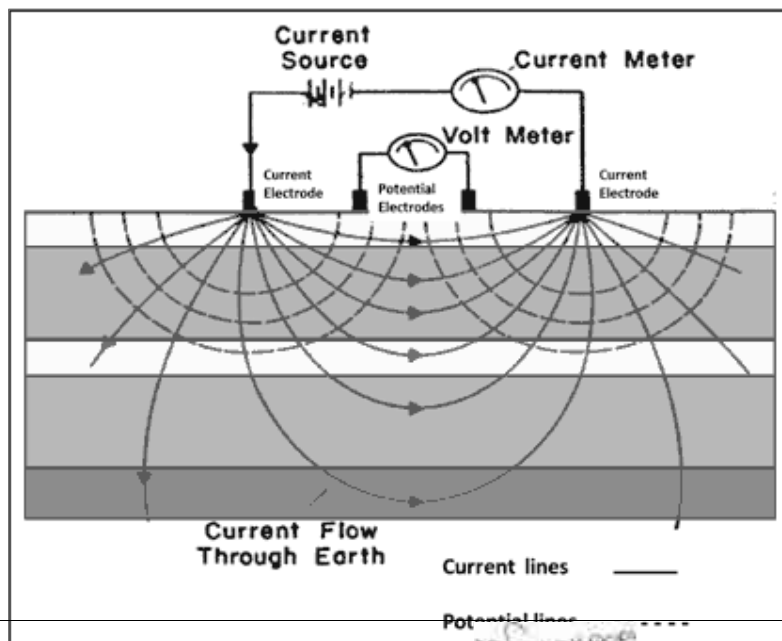
Where  $dV$  is the potential difference across the resistor and  $I$  is the electric current through the resistor. The specific resistivity may be determined by:

$$R_s = (A/L) * (dV/I) \text{ (in Ohm m)}$$

### Vertical Electrical Sounding (VES)

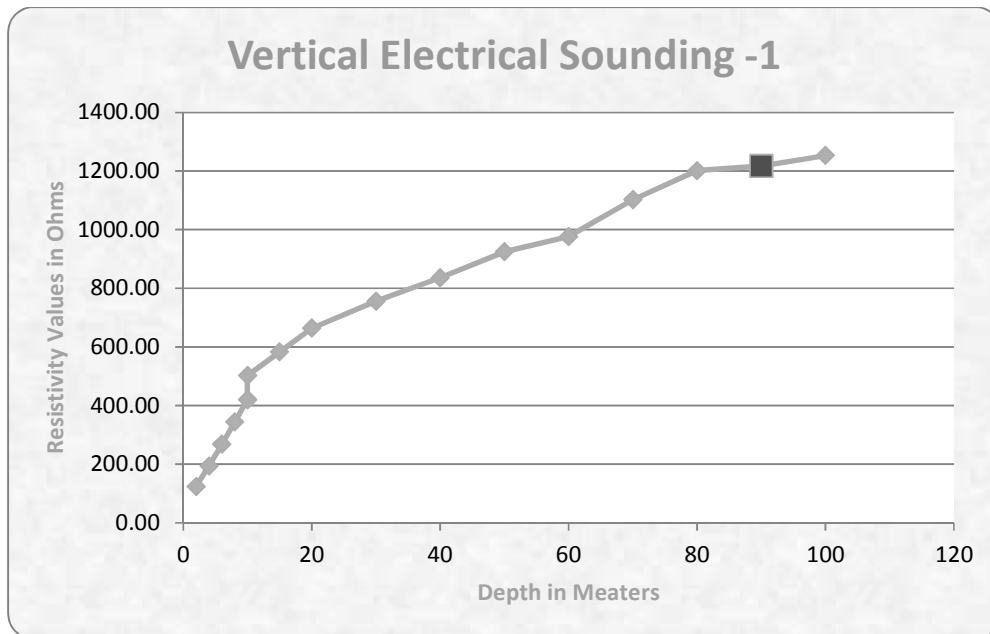
When carrying out a resistivity sounding, current is led into the ground by means of two electrodes. With two other electrodes, situated near the center of the array, the potential field generated by the current is measured. From the observations of the current strength and the potential difference, and taking into account the electrode separations, the ground resistivity can be determined. During a resistivity sounding, the separation between the electrodes is step-wise increased (known as a Schlumberger Array), thus causing the flow of current to penetrate greater depths. When plotting the observed resistivity values against depth on double logarithmic paper, a resistivity graph is formed, which depicts the variation of resistivity with depth. This graph can be interpreted with the aid of a computer, and the actual resistivity layering of the subsoil is obtained. The depths and resistivity values provide the hydro geologist with information on the geological layering and thus the occurrence of groundwater.

### Vertical Electrical Sounding Method (VES)



### Geophysical Data and graph Diagram

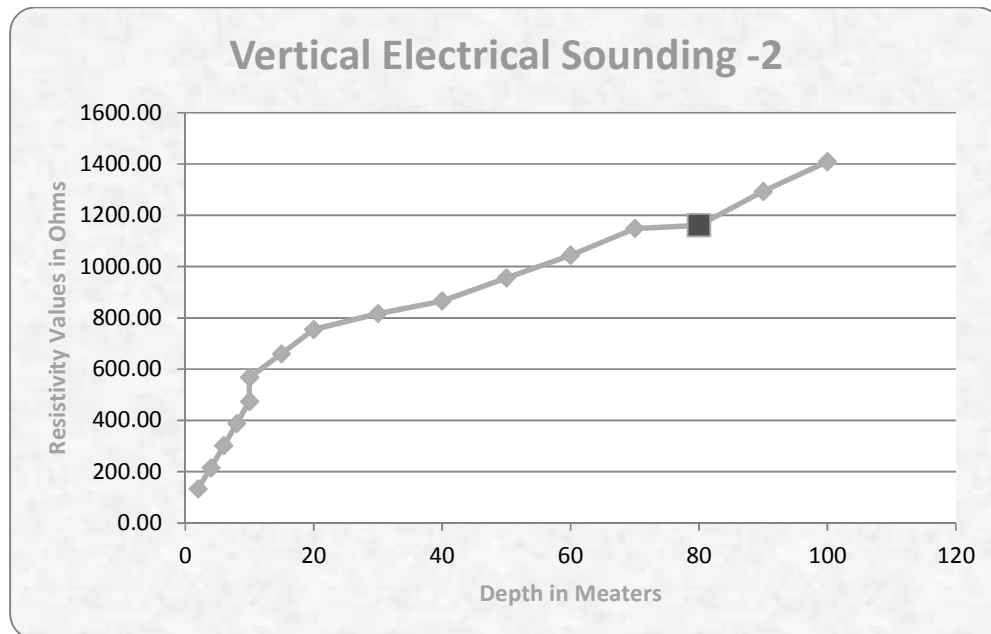
| Vertical Electrical Sounding - 1                |         |         |                        |                          |                             |
|---|---------|---------|------------------------|--------------------------|-----------------------------|
| GPS Coordinates - 11°25'51.69" N 77°10'07.91" E |         |         |                        |                          |                             |
| S.No  | Ab/2(m) | Mn/2(m) | Geometrical Factor (G) | Resistance Value in Ohms | Apparent Resistance in Ohms |
| 1   | 2       | 1       | 4.71                   | 26.15                    | 123.03                      |
| 2   | 4       | 1       | 23.55                  | 8.20                     | 193.11                      |
| 3   | 6       | 1       | 54.95                  | 4.88                     | 267.61                      |
| 4   | 8       | 1       | 98.91                  | 3.47                     | 344.21                      |
| 5   | 10      | 1       | 155.45                 | 2.72                     | 419.72                      |
| 6   | 10      | 5       | 23.55                  | 21.30                    | 502.09                      |
| 7   | 15      | 5       | 62.80                  | 9.29                     | 582.78                      |
| 8   | 20      | 5       | 117.75                 | 5.63                     | 664.11                      |
| 9   | 30      | 5       | 274.75                 | 2.74                     | 755.56                      |
| 10  | 40      | 5       | 494.55                 | 1.72                     | 835.79                      |
| 11  | 50      | 5       | 777.15                 | 1.21                     | 924.81                      |
| 12  | 60      | 5       | 1122.55                | 0.88                     | 976.62                      |
| 13  | 70      | 5       | 1530.75                | 0.73                     | 1102.14                     |
| 14  | 80      | 5       | 2001.75                | 0.62                     | 1201.05                     |
| 15  | 90      | 5       | 2535.55                | 0.45                     | 1217.06                     |
| 16  | 100     | 5       | 3132.15                | 0.42                     | 1252.86                     |



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◆Based on the vertical electrical sounding graphs purple colour level is fracture zone

| Vertical Eletrical Sounding - 2                |         |         |                        |                          |                             |
|--|---------|---------|------------------------|--------------------------|-----------------------------|
| GPS Coordinates - 11°25'55.19"N 77°10'07.83" E |         |         |                        |                          |                             |
| S.No   | Ab/2(m) | Mn/2(m) | Geometrical Factor (G) | Resistance Value in Ohms | Apparent Resistance in Ohms |
| 1  | 2       | 1       | 4.71                   | 28.25                    | 133.06                      |
| 2  | 4       | 1       | 23.55                  | 9.13                     | 214.78                      |
| 3  | 6       | 1       | 54.95                  | 5.47                     | 301.13                      |
| 4  | 8       | 1       | 98.91                  | 3.90                     | 387.73                      |
| 5  | 10      | 1       | 155.45                 | 3.02                     | 474.12                      |
| 6  | 10      | 5       | 23.55                  | 24.14                    | 567.56                      |
| 7  | 15      | 5       | 62.80                  | 10.49                    | 659.40                      |
| 8  | 20      | 5       | 117.75                 | 6.40                     | 754.78                      |
| 9  | 30      | 5       | 274.75                 | 2.94                     | 816.01                      |
| 10   | 40      | 5       | 494.55                 | 1.78                     | 865.46                      |
| 11   | 50      | 5       | 777.15                 | 1.24                     | 955.89                      |
| 12   | 60      | 5       | 1122.55                | 0.92                     | 1043.97                     |
| 13   | 70      | 5       | 1530.75                | 0.75                     | 1148.06                     |
| 14   | 80      | 5       | 2001.75                | 0.55                     | 1161.02                     |
| 15   | 90      | 5       | 2535.55                | 0.48                     | 1293.13                     |
| 16   | 100     | 5       | 3132.15                | 0.40                     | 1409.47                     |

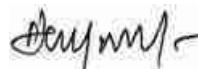


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◆Based on the vertical electrical sounding graphs purple colour level is fracture zone

## 2. CONCLUSION –

Based on the available information and the geophysical investigations it is concluded that the project area is considered to have medium groundwater potential. Productive aquifers are expected at depth of 80m to 85m where minor fractures are observed and shallow aquifers are expected above 65m-70m BGL. The ultimate pit limit as per the approved mining plan depth is 41m below ground level, which will have no impact on the Ground Water.



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ஐயா/அம்மையர்,

ந.க.2155/2023/அ3

நாள்:10.05.2023

பொருள் : கனிமங்களும் குவாரிகளும் - ஈரோடு மாவட்டம் - சத்தியமங்கலம் வட்டம் - குரும்பாளையம் கிராமம் - புல எண்.151-ல் பகுதி மற்றும் 152/4-இல் உள்ள பு.ஹெ.2.28.40 பரப்பளவில் உள்ள புலத்தில் சாதாரண கற்கள் / கிராவல் மண் வெட்டியெடுக்க 10 வருடங்களுக்கு குவாரி குத்தகை உரிமம் கோரி திரு.என்.டி.சாய்சதா என்பவர் மனு செய்தது - அறிக்கை அனுப்புதல்- தொடர்பாக

- பார்வை 1. கோபிசெட்டிபாளையம் வருவாய் கோட்டாட்சியர் அவர்களின் ந.க.2762/2023/ஆ3, நாள்.29.03.2023
2. புஞ்சை புளியம்பட்டி உள்வட்ட நிலவருவாய் ஆய்வாளர் அறிக்கை நாள்:21.4.2023
3. அரசாணை(பல்வகை) எண்.243 தொழில், முதலீட்டு ஊக்குவிப்பு மற்றும் வர்த்தக துறை நாள்:14.12.2022

ஈரோடு மாவட்டம், சத்தியமங்கலம் வட்டம், பு.புளியம்பட்டி உள்வட்டம், குரும்பாளையம் கிராமம், புல எண்.151-ல் பு.ஹெக்டேர் 2.16.00 ஏர்ஸ் பரப்பு பூமியில் பு.ஹெக்டேர் 1.29.90 ஏர்ஸ் பரப்பு மற்றும் புல எண்.152/4-ல் பு.ஹெக்டேர் 0.98.50 ஏர்ஸ் ஆக மொத்தம் பு.ஹெக்டேர் 2.28.40 ஏர்ஸ் பரப்பளவில் சாதாரண கற்கள்/ கிராவல் மண் வெட்டியெடுக்க 10 வருடங்களுக்கு குவாரி குத்தகை உரிமம் வழங்கக்கோரி ஈரோடு மாவட்டம், ஈரோடு கரூர் பையாஸ் ரோடு, 12, காந்திஜி 3-வது தெரு என்ற முகவரியினைச் சார்ந்த திரு.என்.டி.சாய்சதா த/பெ.தியாகராஜன் என்பவர் அளித்த மனு தொடர்பாக புலத்தணிக்கை மற்றும் விசாரணை செய்து எனதறிக்கையினை பின்வருமாறு சமர்ப்பித்துக்கொள்கிறேன்.

குவாரி குத்தகை உரிமம் அனுமதி வழங்கக்கோரும் புல எண்.151 பு.ஹெக்டேர் 2.16.00 ஏர்ஸ் பரப்பானது பு.புளியம்பட்டி சார்பதிவக கிரைய ஆவண எண்.2026/2017 நாள்:14.07.2017 மற்றும் புல எண்.152/4-ல் பு.ஹெக்டேர் 0.98.50 ஏர்ஸ் பரப்பானது பு.புளியம்பட்டி சார்பதிவக கிரைய ஆவண எண்.2028/2017 நாள்:14.07.2017-ன்படி திரு.என்.டி.சாய்சதா த/பெ.தியாகராஜன் என்பவருக்கு தனியாக பாத்தியப்பட்டுள்ளது. குவாரி குத்தகை உரிமம் வழங்குவது தொடர்பாக கடந்த 05.04.2023 அன்று "அ1" விளம்பரம் செய்யப்பட்டது. நாளதுவரை பொதுமக்களிடமிருந்து ஆட்சேபணைகள் ஏதும் வரப்பெறவில்லை.


2.0.157.2

குவாரி குத்தகை உரிமம் அனுமதி வழங்கக்கோரும் புல எண்.151-இன் எல்லைகளாக, வடக்கில் சுமார் 60 மீட்டருக்கு அப்பால் காப்பு காடுகள், தெற்கில் புல எண்.150-ம், கிழக்கில் புல எண்.152/1,2,3,4-ம், மேற்கில் புல எண்.140- ஆகியவையும், மற்றொரு புல எண்.152/4-க்கு வடக்கில் புல எண்.152/3-ம், தெற்கில் புல எண்.149, 148-ம், கிழக்கில் புல எண்.154-ம், மேற்கில் புல எண்.151-ம் உள்ளது.

மேற்படி குவாரி குத்தகை உரிமம் கோரும் புல எண்.151, புல எண்.152/4 ஆகிய காலைகளிலிருந்து வடக்கே சுமார் 60 மீட்டர் தொலைவில் காப்பு காடுகள் அமைந்துள்ளது. இதனை ஒட்டிய பகுதியில் குவாரிகள் செயல்பட பார்வை-3 இல் கண்ட அரசாணையின்படி விலக்களிக்கப்பட்டுள்ளது. மேற்படி புல எண்.151 மற்றும் புல எண்.152/4 ஆகிய காலைகளில் குவாரி அமையப்பெறும் எல்லைகள் பு.புளியம்பட்டி உள்வட்ட அளவரால் அளவீடு செய்யப்பட்டு நான்கு புறமும் எல்லை கற்கள் நடப்பட்டுள்ளது என்பதற்கான சான்று பெறப்பட்டு இணைக்கப்பட்டுள்ளது. இப்புலங்களுக்கு அருகில் 300 மீட்டர் சுற்றளவிற்குள் கிராமத்தம், அங்கீகரிக்கப்பட்ட குடியிருப்பு மனைகள், கட்டுமானங்கள், சுமார் 1 கி.மீ சுற்றளவிற்குள் சரணாலயங்கள், சுற்றுச்சூழல் உணர்திறன் மண்டலப்பகுதிகள் மற்றும் 300 மீட்டர் சுற்றளவிற்குள் புராதனச் சின்னங்கள் போன்றவை ஏதுமில்லை. மேற்படி புலங்கள் தொடர்பாக நீதிமன்ற வழக்குகள் ஏதும் நிலுவையில் இல்லை. மேலும் இப்புலங்கள் அரசின் நில எடுப்பு பிரேரணையில் இல்லை. இப்புலங்கள் தொடர்பாக தடையாணை புத்தகத்தில் புதிவுகள் ஏதுமில்லை. மேற்படி புலங்களுக்கு நிலவரி பாக்கி இனங்கள் ஏதும் நிலுவையில் இல்லை.

எனவே ஈரோடு மாவட்டம், சத்தியமங்கலம் வட்டம், பு.புளியம்பட்டி உள்வட்டம், குரும்பாளையம் கிராமம், புல எண்.151-ல் பு.ஹெக்டேர் 2.16.00 ஏர்ஸ் பரப்பு பூமியில் பு.ஹெக்டேர் 1.29.90 ஏர்ஸ் பரப்பு மற்றும் புல எண்.152/4-ல் பு.ஹெக்டேர் 0.98.50 ஏர்ஸ் ஆக மொத்தம் பு.ஹெக்டேர் 2.28.40 ஏர்ஸ் பரப்பளவில் சாதாரண கற்கள்/ கிராவல் மண் வெட்டியெடுக்க 10 வருடங்களுக்கான உரிமத்தை திரு.என்.டி.சாய்சதா த/பெ.தியாகராஜன் என்பவருக்கு குவாரி குத்தகை உரிமம் வழங்கலாம் என்பதைப் பணிவுடன் தெரிவித்துக்கொள்கிறேன்.

இணைப்பு: தொடர்புடைய ஆவணங்கள்

தங்கள் உண்மையுள்ள,  
  
வருவாய் வட்டாட்சியர்,  
சத்தியமங்கலம்.

15/11/22

2.0.000.31/2023

நிலவருவாய் ஆய்வான் அலுவலகம்,  
பு.புளியம்பட்டி உள்வட்டம்.

நாள்: 21.04.2023

பார்வை: சத்தியமங்கலம் வருவாய் வட்டாட்சியர் அவர்களின்  
ந.க.2155/2023/அ3 நாள்:05.04.2023

பணிநிறுத்தப்படுகிறது

ஈரோடு மாவட்டம், சத்தியமங்கலம் வட்டம், பு.புளியம்பட்டி உள்வட்டம், குரும்பாளையம் கிராமம், புல எண்.151-ல் பு.ஹெக்டேர் 2.16.00 ஏர்ஸ் பரப்பு பூமியில் பு.ஹெக்டேர் 1.29.90 ஏர்ஸ் பரப்பு மற்றும் புல எண்.152/4-ல் பு.ஹெக்டேர் 0.98.50 ஏர்ஸ் ஆக மொத்தம் பு.ஹெக்டேர் 2.28.40 ஏர்ஸ் பரப்பளவில் சாதாரண கற்கள்/ கிராவல் மண் வெட்டியெடுக்க 10 வருடங்களுக்கு குவாரி குத்தகை உரிமம் வழங்கக்கோரி ஈரோடு மாவட்டம், ஈரோடு கரூர் பைபாஸ் ரோடு, 12, காந்திஜி 3-வது தெரு என்ற முகவரியில் வசிக்கும் திரு.என்.டி.சாய்சதா த/பெ.தியாகராஜன் என்பவர் அளித்த மனு தொடர்பாக விசாரணை செய்து எனாதறிக்கையினைக் கீழ்க்கண்டவாறு தெரிவித்துக் கொள்கிறேன்.

1) குவாரி குத்தகை உரிமம் அனுமதி வழங்கக்கோரும் புல எண்.151 மற்றும் புல எண்.152/4 ஆகிய காலகால்களில் குவாரி அமையப்பெறும் எல்லைகள் பு.புளியம்பட்டி உள்வட்ட அளவரால் அளவீடு செய்யப்பட்டு நான்கு புறமும் எல்லை கற்கள் நடப்பட்டுள்ளது என்பதற்கான சான்று பெறப்பட்டு இணைக்கப்பட்டுள்ளது

2) ஈரோடுமாவட்டம், சத்தியமங்கலம் வட்டம், பு.புளியம்பட்டி உள்வட்டம், குரும்பாளையம் கிராமம், புல எண்.151-ல் பு.ஹெக்டேர் 2.16.00 ஏர்ஸ் பரப்பு பூமியில் பு.ஹெக்டேர் 1.29.90 ஏர்ஸ் பரப்பு மற்றும் புல எண்.152/4-ல் பு.ஹெக்டேர் 0.98.50 ஏர்ஸ் ஆக மொத்தம் பு.ஹெக்டேர் 2.28.40 ஏர்ஸ் பரப்பளவில் சாதாரண கற்கள்/ கிராவல் மண் வெட்டியெடுக்க 10 வருடங்களுக்கு குவாரி குத்தகை உரிமம் வழங்கக்கோரி திரு.என்.டி.சாய்சதா த/பெ.தியாகராஜன் என்பவர் அளித்தமனு தொடர்பாக கடந்த 05.04.2023 அன்று "அ1" விளம்பரம் செய்யப்பட்டது. நாளதுவரை பொதுமக்களிடமிருந்து ஆட்சேபணைகள் ஏதும் வரப்பெறவில்லை.

- 3) குவாரி குத்தகை உரிமம் அனுமதி வழங்கக்கோரும் புல எண்.151 மற்றும் புல எண்.152/4 ஆகிய புலங்களுக்கு அருகில் 300 மீட்டர் சுற்றளவிற்குள் கிராமநத்தம், அங்கீகரிக்கப்பட்ட குடியிருப்பு மனைகள், மற்றும் கட்டுமானங்கள் ஏதுமில்லை. மேற்படி புலமான 151-க்கு அருகில் 60 மீட்டருக்கு அப்பால் காப்பு காடுகள் அமைந்துள்ளது
- 4) குவாரி குத்தகை உரிமம் அனுமதி வழங்கக்கோரும் புல எண்.151 பு.ஹெக்டேர் 2.16..00 ஏர்ஸ் பரப்பானது பு.புளியம்பட்டி சார்பதிவக கிரைய ஆவண எண்.2026/2017 நாள்:14.07.2017 மற்றும் புல எண்.152/4-ல் பு.ஹெக்டேர் 0.98.50 ஏர்ஸ் பரப்பானது பு.புளியம்பட்டி சார்பதிவக கிரைய ஆவண எண்.2028/2017 நாள்:14.07.2017-ன்படி திரு.என்.டி.சாய்சதா த/பெ.தியாகராஜன் என்பவருக்கு தனியாக பாத்தியப்பட்டுள்ளது. பத்திரநகல் இணைக்கப்பட்டுள்ளது.
- 5) குவாரி குத்தகை உரிமம் அனுமதி வழங்கக்கோரும் புல எண்.151 மற்றும் புல எண்.152/4 ஆகிய புலங்கள் தொடர்பாக நீதிமன்ற வழக்குகள் ஏதும் நிலுவையில் இல்லை.
- 6) குவாரி குத்தகை உரிமம் அனுமதி வழங்கக்கோரும் புல எண்.151 மற்றும் புல எண்.152/4 ஆகிய புலங்கள் அரசின் நில எடுப்பு பிரேரணையில் இல்லை.
- 7) குவாரி குத்தகை உரிமம் அனுமதி வழங்கக்கோரும் புல எண்.151 மற்றும் புல எண்.152/4 ஆகிய புலங்கள் தொடர்பாக தடையாணை புத்தகத்தில் புதிவுகள் ஏதுமில்லை.
- 8) குவாரி குத்தகை உரிமம் அனுமதி வழங்கக்கோரும் புல எண்.151 மற்றும் புல எண்.152/4 ஆகிய புலங்களுக்கு நிலவரி பாக்கி இனங்கள் ஏதும் நிலுவையில் இல்லை.
- 9) குவாரி குத்தகை உரிமம் அனுமதி வழங்கக்கோரும் புல எண்.151-க்கு வடக்கில் சுமார் 60 மீட்டருக்கு அப்பால் காப்பு காடுகள், தெற்கில் புல எண்.150-ம், கிழக்கில் புல எண்.152/1,2,3,4-ம், மேற்கில் புல எண்.140-ம் மற்றும் புல எண்.152/4-க்கு வடக்கில் புல எண்.152/3-ம், தெற்கில் புல எண்.149, 148-ம், கிழக்கில் புல எண்.154-ம், மேற்கில் புல எண்.151-ம் உள்ளது. மற்றும் புல எண்.151, புல எண்.152/4 ஆகிய புலங்களை சுற்றிலும் சுமார் ஒரு கி.மீட்டர் சுற்றளவிற்குள் சரணாலயங்கள், சுற்றுச்சூழல் உணர்திறன் மண்டலப்பகுதிகள் மற்றும் 300 மீட்டர் சுற்றளவிற்குள் புராதனச் சின்னங்கள் ஏதுமில்லை.

எண்: 152/4  
மேற்படி குவாரி குத்தகை உரிமம் கோரும் புல எண்.151, புல எண்.152/4 ஆகிய  
காலைகளிலிருந்து வடக்கே சுமார் 60 மீட்டர் தொலைவில் காப்பு காடுகள் அமைந்துள்ளது.  
குவாரிகள் செயல்பட அரசாணை நிலை எண்.243 நாள்:14.12.2022-ன்படி காப்பு  
காடுகளிலிருந்து விலக்கு அளிக்கப்பட்டுள்ளது. ( அரசாணை நகல் இணைக்கப்பட்டுள்ளது)

எனவே ஈரோடு மாவட்டம், சத்தியமங்கலம் வட்டம், பு.புளியம்பட்டி உள்வட்டம்,  
குரும்பாளையம் கிராமம், புல எண்.151-ல் பு.ஹெக்டேர் 2.16.00 ஏர்ஸ் பரப்பு பூமியில்  
பு.ஹெக்டேர் 1.29.90 ஏர்ஸ் பரப்பு மற்றும் புல எண்.152/4-ல் பு.ஹெக்டேர் 0.98.50 ஏர்ஸ் ஆக  
மொத்தம் பு.ஹெக்டேர் 2.28.40 ஏர்ஸ் பரப்பளவில் சாதாரண கற்கள்/ கிராவல் மண்  
வெட்டியெடுக்க 10 வருடங்களுக்கு ஈரோடு மாவட்டம், ஈரோடு கரூர் பைபாஸ் ரோடு, 12,  
காந்திஜி 3-வது தெரு என்ற முகவரியில் வசிக்கும் திரு.என்.டி.சாய்சதா த/பெ.தியாகராஜன்  
என்பவருக்கு குவாரி குத்தகை உரிமம் வழங்கலாம் என்பதையும், இத்துடன் கிராமக்கணக்கு  
நகல்கள், கிராம நிர்வாக அலுவலர் வாக்குமூலம் மற்றும் ஆவணங்களை இணைத்து  
அனுப்பியுள்ளேன் என்பதையும் பணிவுடன் தெரிவித்துக் கொள்கிறேன்.

இணைப்பு: மேற்கண்டவாறு

6.2.2023  
நிலவருவாய ஆய்வாளர்,  
பு.புளியம்பட்டி உள்வட்டம்.

பெறுநர்:

வருவாய் வட்டாட்சியர்,  
சத்தியமங்கலம்.

ஈரோடு மாவட்டம், சத்தியமங்கலம் வட்டம், விண்ணப்பள்ளிகுருப் கிராம நிர்வாக அலுவலர் ஆகிய நான் கொடுக்கும் வாக்குமூலம்.

ஈரோடு மாவட்டம், சத்தியமங்கலம் வட்டம், பு.புளியம்பட்டி உள்வட்டம், குரும்பாளையம் கிராமம், புல எண்.151-ல் பு.ஹெக்டேர் 2.16.00 ஏர்ஸ் பரப்பு பூமியில் பு.ஹெக்டேர் 1.29.90 ஏர்ஸ் பரப்பு மற்றும் புல எண்.152/4-ல் பு.ஹெக்டேர் 0.98.50 ஏர்ஸ் ஆக மொத்தம் பு.ஹெக்டேர் 2.28.40 ஏர்ஸ் பரப்பளவில் சாதாரண கற்கள்/ கிராவல் மண் வெட்டியெடுக்க 10 வருடங்களுக்கு குவாரி குத்தகை உரிமம் வழங்கக்கோரி ஈரோடு மாவட்டம், ஈரோடு கரூர் பைபாஸ் ரோடு, 12, காந்திஜி 3-வது தெரு என்ற முகவரியில் வசிக்கும் திரு.என்.டி.சாய்சதா த/பெ.தியாகராஜன் என்பவர் அளித்த மனு தொடர்பாக விசாரணை என்பதை தெரிந்து கொண்டேன்.

1) குவாரி குத்தகை உரிமம் அனுமதி வழங்கக்கோரும் புல எண்.151 மற்றும் புல எண்.152/4 ஆகிய காலகாலில் குவாரி அமையப்பெறும் எல்லைகள் பு.புளியம்பட்டி உள்வட்ட அளவரால் அளவீடு செய்யப்பட்டு நான்கு புறமும் எல்லை கற்கள் நடப்பட்டுள்ளது என்பதற்கான சான்று பெறப்பட்டு இணைக்கப்பட்டுள்ளது

2) ஈரோடுமாவட்டம், சத்தியமங்கலம் வட்டம், பு.புளியம்பட்டி உள்வட்டம், குரும்பாளையம் கிராமம், புல எண்.151-ல் பு.ஹெக்டேர் 2.16.00 ஏர்ஸ் பரப்பு பூமியில் பு.ஹெக்டேர் 1.29.90 ஏர்ஸ் பரப்பு மற்றும் புல எண்.152/4-ல் பு.ஹெக்டேர் 0.98.50 ஏர்ஸ் ஆக மொத்தம் பு.ஹெக்டேர் 2.28.40 ஏர்ஸ் பரப்பளவில் சாதாரண கற்கள்/ கிராவல் மண் வெட்டியெடுக்க 10 வருடங்களுக்கு குவாரி குத்தகை உரிமம் வழங்கக்கோரி திரு.என்.டி.சாய்சதா த/பெ.தியாகராஜன் என்பவர் அளித்தமனு தொடர்பாக கடந்த 05.04.2023 அன்று "அ1" விளம்பரம் செய்யப்பட்டது. நாளதுவரை பொதுமக்களிடமிருந்து ஆட்சேபணைகள் ஏதும் வரப்பெறவில்லை.

3) குவாரி குத்தகை உரிமம் அனுமதி வழங்கக்கோரும் புல எண்.151 மற்றும் புல எண்.152/4 ஆகிய புலங்களுக்கு அருகில் 300 மீட்டர் சுற்றளவிற்குள் கிராமநத்தம், அங்கீகரிக்கப்பட்ட சூழியிருப்பு மனைகள், மற்றும் கட்டுமானங்கள் ஏதுமில்லை. மேற்படி புலமான 151-க்கு அருகில் 60 மீட்டருக்கு அப்பால் காப்பு காடுகள் அமைந்துள்ளது

4) குவாரி குத்தகை உரிமம் அனுமதி வழங்கக்கோரும் புல எண்.151 பு.ஹெக்டேர் 2.16.00<sup>\*</sup> ஏர்ஸ் பரப்பானது பு.புனியம்பட்டி சார்பதிவக கிரைய ஆவண எண்.2026/2017 நாள்:14.07.2017 மற்றும் புல எண்.152/4-ல் பு.ஹெக்டேர் 0.98.50 ஏர்ஸ் பரப்பானது பு.புனியம்பட்டி சார்பதிவக கிரைய ஆவண எண்.2028/2017 நாள்:14.07.2017-ன்படி திரு.என்.டி.சாய்சதா த/பெ.தியாகராஜன் என்பவருக்கு தனியாக பாத்தியப்பட்டுள்ளது. பத்திரநகல் இணைக்கப்பட்டுள்ளது.

5) குவாரி குத்தகை உரிமம் அனுமதி வழங்கக்கோரும் புல எண்.151 மற்றும் புல எண்.152/4 ஆகிய புலங்கள் தொடர்பாக நீதிமன்ற வழக்குகள் ஏதும் நிலுவையில் இல்லை

6) குவாரி குத்தகை உரிமம் அனுமதி வழங்கக்கோரும் புல எண்.151 மற்றும் புல எண்.152/4 ஆகிய புலங்கள் அரசின் நில எடுப்பு பிரேரணையில் இல்லை.

7) குவாரி குத்தகை உரிமம் அனுமதி வழங்கக்கோரும் புல எண்.151 மற்றும் புல எண்.152/4 ஆகிய புலங்கள் தொடர்பாக தடையாணை புத்தகத்தில் புதிவுகள் ஏதுமில்லை.

8) குவாரி குத்தகை உரிமம் அனுமதி வழங்கக்கோரும் புல எண்.151 மற்றும் புல எண்.152/4 ஆகிய புலங்களுக்கு நிலவரி பாக்கி இனங்கள் ஏதும் நிலுவையில் இல்லை.

9) குவாரி குத்தகை உரிமம் அனுமதி வழங்கக்கோரும் புல எண்.151-க்கு வடக்கில் சுமார் 60 மீட்டருக்கு அப்பால் காப்பு காடுகள், தெற்கில் புல எண்.150-ம், கிழக்கில் புல எண்.152/1,2,3,4-ம், மேற்கில் புல எண்.140-ம் மற்றும் புல எண்.152/4-க்கு வடக்கில் புல எண்.152/3-ம், தெற்கில் புல எண்.149, 148-ம், கிழக்கில் புல எண்.154-ம், மேற்கில் புல எண்.151-ம் உள்ளது. மற்றும் புல எண்.151, புல எண்.152/4 ஆகிய புலங்களை சுற்றிலும் சுமார் ஒரு கி.மீட்டர் சுற்றளவிற்குள் சரணாலயங்கள், சுற்றுச்சூழல் உணர்திறன் மண்டலப்பகுதிகள் மற்றும் 300 மீட்டர் சுற்றளவிற்குள் புராதனச் சின்னங்கள் ஏதுமில்லை.


மேற்படி குவாரி குத்தகை உரிமம் கோரும் புல எண்.151, புல எண்.152/4 ஆகிய காலகளிலிருந்து வடக்கே சுமார் 60 மீட்டர் தொலைவில் காப்பு காடுகள் அமைந்துள்ளது. குவாரிகள் செயல்பட அரசாணை நிலை எண்.243 நாள்:14.12.2022-ன்படி காப்பு காடுகளிலிருந்து விலக்கு அளிக்கப்பட்டுள்ளது. ( அரசாணை நகல் இணைக்கப்பட்டுள்ளது)

எனவே ஈரோடு மாவட்டம், சத்தியமங்கலம் வட்டம், பு.புளியம்பட்டி உள்வட்டம், குரும்பாளையம் கிராமம், புல எண்.151-ல் பு.ஹெக்டேர் 2.16.00 ஏர்ஸ் பரப்பு பூமியில் பு.ஹெக்டேர் 1.29.90 ஏர்ஸ் பரப்பு மற்றும் புல எண்.152/4-ல் பு.ஹெக்டேர் 0.98.50 ஏர்ஸ் ஆக மொத்தம் பு.ஹெக்டேர் 2.28.40 ஏர்ஸ் பரப்பளவில் சாதாரண கற்கள்/ கிராவல் மண் வெட்டியெடுக்க 10 வருடங்களுக்கு ஈரோடு மாவட்டம், ஈரோடு கரூர் பைபாஸ் ரோடு, 12, காந்திஜி 3-வது தெரு என்ற முகவரியில் வசிக்கும் திரு.என்.டி.சாய்சதா த/பெ.தியாகராஜன் என்பவருக்கு குவாரி குத்தகை உரிமம் வழங்கலாம் என்பதைப் பணிவுடன் தெரிவித்துக் கொள்கிறேன்.

/என் முன்னால்/

  
நீல வருவாய் ஆய்வாளர்  
புஞ்சை புளியம்பட்டி.

/படித்துப்பார்த்தேன்.சரி/

  
24/9/23  
கீராய நீர்வாக அலுவலர்  
44. விண்ணப்பாளி.  
43. குரும்பாளையம்,  
சத்தியமங்கலம் வட்டம்.



பணிநீதனுப்பப்படுகிறது :

சத்தியமங்கலம் வட்டம், குரும்பாளையம் கிராமம் புல எண் 151, 152/4 -ல் புதியதாக குவாரி அமைப்பதற்காக தனது பூமியில் எல்லை அளவு கோரி திரு சாய்சதா என்பவர் மனு செய்ததின் பேரில் புலத்தணிக்கை மேற்கொள்ளப்பட்டது.

மேற்படி பூமியானது புல எண் 151, 152/4 - ல் பாத்தியப்பட்ட புலமானது மனுதாரர்க்கு கிரைய வகையில் பாத்தியப்பட்ட பூமியாகும். மேற்படி பூமியில் மனுதாரர் புல எண் 151 - ல் 1.29.90 ஹெக்டேர்க்கு பு.ஏக்கர் 3.21 செண்ட் மற்றும் 152/4 பு.ஹெக்டேர் 0.98.50 பு.ஏக்கர் 2.43 செண்ட் ஆக மொத்தம் பு.ஹெக்டேர் 2.28.04 பு.ஏக்கர் 5.63 செண்ட் அளவைப் பணி மேற்கொண்டு மனுதாரர்க்கு பாத்தியப்பட்ட குவாரி அமைய உள்ள இடங்களில் நான்கு புற எல்லைகளிலும் கற்கள் ஊன்றி எல்லைகளை தெரிந்து கொண்டார் என்பதை பணிவுடன் தெரிவித்துக் கொள்கிறேன்.

*Domaswamy*  
24.4.2023  
உள்வட்ட அளவர்,  
பு.புளியம்பட்டி உள்வட்ட  
சத்தியமங்கலம் வட்டம்.

நிலவருவாய் ஆய்வாளர் அலுவலகம்,  
பு.புளியம்பட்டி உள்வட்டம்.

நாள்: 05.04.2023

"அ1" விளம்பரம்

ஈரோடுமாவட்டம், சத்தியமங்கலம் வட்டம், பு.புளியம்பட்டி உள்வட்டம், குரும்பாளையம் கிராமம், புல எண்.151-ல் பு.ஹெக்டேர் 2.16.00 ஏர்ஸ் பரப்பு பூமியில் பு.ஹெக்டேர் 1.29.90 ஏர்ஸ் பரப்பு மற்றும் புல எண்.152/4-ல் பு.ஹெக்டேர் 0.98.50 ஏர்ஸ் ஆக மொத்தம் பு.ஹெக்டேர் 2.28.40 ஏர்ஸ் பரப்பளவில் சாதாரண கற்கள்/ கிராவல் மண் வெட்டியெடுக்க 10 வருடங்களுக்கு குவாரி குத்தகை உரிமம் வழங்கக்கோரி ஈரோடு மாவட்டம், ஈரோடு கரூர் பைபால் ரோடு, 12, காந்திஜி 3-வது தெரு என்ற முகவரியில் வசிக்கும் திரு.என்.டி.சாய்சதா த/பெ.தியாகராஜன் என்பவர் அளித்த மனு மீது நடவடிக்கை மேற்கொள்ளப்பட்டு வருகிறது. இது குறித்து பொதுமக்களுக்கு ஆட்சேபணை இருப்பின் இவ்விளம்பரம் கண்ட 15 தினங்களுக்குள் சத்தியமங்கலம் வருவாய் வட்டாட்சியர் அவர்களுக்கோ, பு.புளியம்பட்டி நிலவருவாய் ஆய்வாளர் அவர்களுக்கோ கடிதம் மூலமாக தெரியப்படுத்தவும். குறிப்பிட்ட நாட்களுக்குள் ஆட்சேபணை ஏதும் வராவிடில், ஆட்சேபணை ஏதும் இல்லை எனக்கருதி மேற்படி நபருக்கு குரும்பாளையம் கிராமம், புல எண்.151-ல் பு.ஹெக்டேர் 1.29.90 ஏர்ஸ் பரப்பு மற்றும் புல எண்.152/4-ல் பு.ஹெக்டேர் 0.98.50 ஏர்ஸ் ஆக மொத்தம் பு.ஹெக்டேர் 2.28.40 ஏர்ஸ் பரப்பளவில் சாதாரண கற்கள்/ கிராவல் மண் வெட்டியெடுக்க 10 வருடங்களுக்கு குவாரி குத்தகை உரிமம் வழங்க நடவடிக்கை எடுக்கப்படும் என இதன் மூலம் கிராம பொதுமக்களுக்குத் தெரியப்படுத்தப்படுகிறது.

15-04-2023  
நிலவருவாய் ஆய்வாளர்  
பு.புளியம்பட்டி உள்வட்டம்.

பெறுநர்

கிராமநிர்வாக அலுவலர்,  
குரும்பாளையம் கிராமம்,  
சத்தியமங்கலம் வட்டம்.

(கிராம நிர்வாக அலுவலர் மேற்படி விளம்பரத்தினை கிராமத்திலும், மஜராக்களிலும் தண்ணீரா மூலம் பிரசித்தம் செய்து பொதுமக்கள் கையொப்பம் பெற்று மீள சமர்ப்பிக்குமாறு கேட்டுக்கொள்ளப்படுகிறார்.)

v R. Vignesh (R. vignesh)

V. Praveen Kumar  
V. Praveen Kumar  
Ajith  
V. SRINIVASAN v. சிவசண்

\* m. Vell

m. VECU

\* V. Vithal

V. Vithal Kumar

\* M. Senthil Kumar

m. Senthil Kumar

\* C. V. Venkatesh

C. Venkatesh

\* M. Jey

M. Jey

\* M. Jey

\* M. Jey

\* M. Jey

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\* M. Jey

\* M. Jey

**தணிக்கை குறிப்பு**

|            |   |                   |
|------------|---|-------------------|
| வட்டம்     | : | சத்தியமங்கலம்     |
| கிராமம்    | : | குரும்பாளையம்     |
| புல எண்கள் | : | 151,152/4         |
| பரப்பு     | : | 2.28.40 ஹெக்டேர், |
| நாள்       | : | 09.5.2023         |

ஈரோடு மாவட்டம், சத்தியமங்கலம் வட்டம், பு.புளியம்பட்டி உள்வட்டம், குரும்பாளையம் கிராமம், புல எண்.151-ல் பு.ஹெக்டேர் 2.16.00 ஏர்ஸ் பரப்பு பூமியில் பு.ஹெக்டேர் 1.29.90 ஏர்ஸ் பரப்பு மற்றும் புல எண்.152/4-ல் பு.ஹெக்டேர் 0.98.50 ஏர்ஸ் ஆக மொத்தம் பு.ஹெக்டேர் 2.28.40 ஏர்ஸ் பரப்பளவில் சாதாரண கற்கள்/ கிராவல் மண் வெட்டியெடுக்க 10 வருடங்களுக்கு குவாரி குத்தகை உரிமம் வழங்கக்கோரி ஈரோடு மாவட்டம், ஈரோடு கருர் பைபாஸ் ரோடு, 12, காந்திஜி 3-வது தெரு என்ற முகவரியினைச் சார்ந்த திரு.என்.டி.சாய்சதா த/பெ.தியாகராஜன் என்பவர் அளித்த மனு தொடர்பாக இன்று 09.5.2023 இல் புலத்தணிக்கை செய்யப்பட்டது. புலத்தணிக்கையின்போது, புஞ்சை புளியம்பட்டி நிலவருவாய் ஆய்வாளர் மற்றும் குரும்பாளையம் கிராம நிர்வாக அலுவலர் ஆகியோர் உடன் இருந்தனர்.

குவாரி குத்தகை உரிமம் அனுமதி வழங்கக்கோரும் புல எண்.151 பு.ஹெக்டேர் 2.16.00 ஏர்ஸ் பரப்பானது பு.புளியம்பட்டி சார்பதிவக கிரைய ஆவண எண்.2026/2017 நாள்:14.07.2017 மற்றும் புல எண்.152/4-ல் பு.ஹெக்டேர் 0.98.50 ஏர்ஸ் பரப்பானது பு.புளியம்பட்டி சார்பதிவக கிரைய ஆவண எண்.2028/2017 நாள்:14.07.2017-ன்படி திரு.என்.டி.சாய்சதா த/பெ.தியாகராஜன் என்பவருக்கு தனியாக பாத்தியப்பட்டுள்ளது. குவாரி குத்தகை உரிமம் வழங்குவது தொடர்பாக கடந்த 05.04.2023 அன்று "அ1" விளம்பரம் செய்யப்பட்டு பொதுமக்களிடமிருந்து ஆட்சேபணைகள் ஏதும் வரப்பெறவில்லை.

குவாரி குத்தகை உரிமம் அனுமதி வழங்கக்கோரும் புல எண்.151-இன் எல்லைகளாக, வடக்கில் சுமார் 60 மீட்டருக்கு அப்பால் காப்பு காடுகள், தெற்கில் புல எண்.150-ம், கிழக்கில் புல எண்.152/1,2,3,4-ம், மேற்கில் புல எண்.140- ஆகியவையும், மற்றொரு புல எண்.152/4-க்கு வடக்கில் புல எண்.152/3-ம், தெற்கில் புல எண்.149, 148-ம், கிழக்கில் புல எண்.154-ம், மேற்கில் புல எண்.151-ம் உள்ளது. மேற்படி காலைகளில் குவாரி அமையப்பெறும் எல்லைகள் பு.புளியம்பட்டி உள்வட்ட அளவரால் அளவீடு செய்யப்பட்டு நான்கு புறமும் எல்லை கற்கள் நடப்பட்டுள்ளது. இப்புலங்களுக்கு அருகில் 300 மீட்டர் சுற்றளவிற்குள் கிராமநத்தம், அங்கீகரிக்கப்பட்ட குடியிருப்பு மனைகள், கட்டுமானங்கள், சுமார் 1 கி.மீ சுற்றளவிற்குள் சரணாலயங்கள், சுற்றுச்சூழல் உணர்திறன் மண்டலப்பகுதிகள் மற்றும் 300 மீட்டர் சுற்றளவிற்குள் புராதனச் சின்னங்கள் ஏதும் இல்லை. மேற்படி புலங்களுக்கு நிலவரி பாக்கி இனங்கள் ஏதும் நிலுவையில் இல்லை.

எனவே புல எண்.151-ல் பு.ஹெக்டேர் 2.16.00 ஏர்ஸ் பரப்பு பூமியில் பு.ஹெக்டேர் 1.29.90 ஏர்ஸ் பரப்பு மற்றும் புல எண்.152/4-ல் பு.ஹெக்டேர் 0.98.50 ஏர்ஸ் ஆக மொத்தம் பு.ஹெக்டேர் 2.28.40 ஏர்ஸ் பரப்பளவில் சாதாரண கற்கள்/ கிராவல் மண் வெட்டியெடுக்க



அனுப்புநர்:

செல்வி.கு.தில்யபிரியதர்ஷினி,பி.இ.,  
வருவாய் கோட்டாட்சியர்,  
கோபிசெட்டிபாளையம்.

பெறுநர்:

மாவட்ட ஆட்சித்தலைவர்,  
ஈரோடு

ந.க.2762/2023/ஆ3

நாள்: 16.06.2023

ஐயா,

பொருள்: கனிமங்களும் குவாரிகளும் - ஈரோடு மாவட்டம் -சத்தியமங்கலம் வட்டம் - குரும்பாளையம் கிராமம் - புல எண்.151 - இல் பகுதி மற்றும் 152/4-இல் உள்ள பு.ஹெ.2.28.40 பரப்பளவில் உள்ள புலத்தில் சாதாரண கற்கள் / கிராவல் மண் வெட்டி எடுக்க 10 வருடங்களுக்கு குவாரி குத்தகை உரிமம் கோரி திரு.எண்.டி.சாய்சதா என்பவர் மனு செய்தது - அறிக்கை அனுப்புதல் - தொடர்பாக.

பார்வை: 1. ஈரோடு மாவட்ட ஆட்சியர் அலுவலக  
ந.க.152/கனிமம்/2023, நாள்: 23.03.2023.  
2. சத்தியமங்கலம் வருவாய் வட்டாட்சியரின்  
ந.க.2155/2023/ அ3, நாள்: 10.05.2023

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ஈரோடு மாவட்டம், சத்தியமங்கலம் வட்டம், குரும்பாளையம் கிராமம், புல எண்.151 - இல் பு.ஹெக் 2.16.00 ஏர்ஸ் பரப்பு பூமியில் பு.ஹெக் 1.29.90 ஏர்ஸ் பரப்பு மற்றும் 152/4-இல் பு.ஹெக் 0.98.50 ஏர்ஸ் ஆக மொத்தம் பு.ஹெக்டேர் 2.28.40 ஏர்ஸ் பரப்பளவில் உள்ள புலத்தில் சாதாரண கற்கள் / கிராவல் மண் வெட்டி எடுக்க 10 வருடங்களுக்கு குவாரி குத்தகை உரிமம் கோரி திரு.எண்.டி.சாய்சதா, த.பெ.தியாகராஜன் என்பவர் மனு செய்தது தொடர்பாக சத்தியமங்கலம் வட்டாட்சியர் அளித்த அறிக்கையின் பேரில் தணிக்கை மேற்கொண்டு எனதறிக்கையினை பின்வருமாறு தெரிவித்துக் கொள்கிறேன்.

குவாரி குத்தகை உரிமம் அனுமதி வழங்க கோரும் புல எண்.151 பு.ஹெக்டேர் 2.16.00 ஏர்ஸ் பரப்பானது பு.புளியம்பட்டி சார்பதிவக கிரைய ஆவண எண்.2026/2017, நாள்: 14.07.2017 மற்றும் புல எண்.152/4- இல் பு.ஹெக்டேர் 0.98.50 ஏர்ஸ் பரப்பானது புஞ்சை புளியம்பட்டி சார்பதிவக கிரைய ஆவண எண்.2028/2017, நாள்: 14.07.2017 - இன் படி திரு.எண்.டி.சாய்சதா, த.பெ.தியாகராஜன் என்பவருக்கு தனியாக பாத்தியப்பட்டுள்ளது.

குவாரி குத்தகை உரிமம் அனுமதி வழங்க கோரும் புல எண்.151 மற்றும் புல எண்.152/4 ஆகிய காலைகளில் குவாரிகள் அமையப்பெறும் எல்லைகள் புஞ்சை புளியம்பட்டி உள்வட்ட அளவரால் அளவிட்டு செய்யப்பட்டு நான்கு புறமும் எல்லை கற்கள் நடப்பட்டுள்ளது என்பதற்கான சான்று பெறப்பட்டு இணைக்கப்பட்டுள்ளது.

**அ1 விளம்பரம் :**

ஈரோடு மாவட்டம், சத்தியமங்கலம் வட்டம், குரும்பாளையம் கிராமம், புல எண்.151 - இல் பு.ஹெக் 2.16.00 ஏர்ஸ் பரப்பு பூமியில் பு.ஹெக் 1.29.90 ஏர்ஸ் பரப்பு மற்றும் 152/4-இல் பு.ஹெக் 0.98.50 ஏர்ஸ் ஆக மொத்தம் பு.ஹெக்டேர் 2.28.40 ஏர்ஸ் பரப்பளவில் உள்ள புலத்தில் சாதாரண கற்கள் / கிராவல் மண் வெட்டி எடுக்க 10 வருடங்களுக்கு குவாரி குத்தகை உரிமம் கோரி திரு.என்.டி.சாய்சதா, த.பெ.தியாகராஜன் என்பவர் மனு செய்தது தொடர்பாக ஆட்சேபணை ஏதும் உள்ளதா என்பது தொடர்பாக குரும்பாளையம் கிராமத்தில் கடந்த 05.04.2023 அன்று அ1 விளம்பரம் செய்யப்பட்டது. நாளது வரை பொதுமக்களிடமிருந்து ஆட்சேபணை ஏதும் வரப்பெறவில்லை.

**குடியிருப்பு பகுதிகள் மற்றும் சாலைகள்:**

குவாரி குத்தகை உரிமம் அனுமதி வழங்க கோரும் புல எண்.151 மற்றும் புல எண்.152/4 ஆகிய புலங்களுக்கு அருகில் 300 மீட்டர் சுற்றளவிற்குள் கிராம நத்தம், அங்கீகரிக்கப்பட்ட குடியிருப்பு மனைகள், மற்றும் கட்டுமானங்கள் ஏதுமில்லை. மண் எடுக்க அனுமதி கோரும் காலையில் இருந்து 50 மீட்டர் சுற்றளவிற்குள் இரயில் பாதைகள், ஆறுகள், குளங்கள், நீர்த்தேக்கங்கள், இதர நிரந்தர கட்டுமானங்கள் மற்றும் வண்டிப்பாதைகள் ஏதுமில்லை.

**மரக்கிரையம் மற்றும் கற்கிரையம் :**

குவாரி குத்தகை உரிமம் அனுமதி வழங்க கோரும் புல எண்.151 மற்றும் புல எண்.152/4 ஆகிய காலையில் அமராய், 2சி மரங்கள் ஏதும் இல்லை. எனவே மரக்கிரையம் ஏதுமில்லை. இப்புலத்தில் கற்கள் ஏதும் இல்லை, எனவே கற்கிரையம் இல்லை.

**வரிவசூல்**

குவாரி குத்தகை உரிமம் அனுமதி வழங்க கோரும் புல எண்.151 மற்றும் புல எண்.152/4 ஆகிய காலைக்கு அரசுக்கு செலுத்த வேண்டிய வரிவசூல் ஏதும் நிலுவையில் இல்லை.

**காடுகள்:**

மேற்படி புல எண்.151 மற்றும் புல எண்.152/4 ஆகிய காலைகளிலிருந்து வடக்கே சுமார் 60 மீட்டர் தொலைவில் காப்பு காடுகள் அமைந்துள்ளது.

**பொது :**

குவாரி குத்தகை உரிமம் அனுமதி வழங்க கோரும் புல எண்.151 மற்றும் புல எண்.152/4 காலையானது தடையாணை புத்தகத்தில் இடம்பெறவில்லை. மேலும் இப்புலத்தில் புராதானச் சின்னங்கள், கோவில், மயானம், சர்ச்சுகள் ஏதுமில்லை. ஆக்கிரமிப்புகள் ஏதுமில்லை. உயர்மீன்வழித்த கம்பிகள் ஏதுமில்லை மேற்படி புலத்தில் நிலமெடுப்பு நடவடிக்கை ஏதுமில்லை. நீதிமன்ற வழக்குகள் ஏதும் நிலுவையில் இல்லை.

புல எண்.151 - இன் செக்குபந்தி விபரம்

1. வடக்கு : 60 மீட்டருக்கு அப்பால் காப்புக்காடுகள் உள்ளது.
2. தெற்கு : புல எண்.150 பட்டா பூமி உள்ளது
3. மேற்கு : புல எண்.140 பட்டா பூமி உள்ளது
4. கிழக்கு : புல எண்.152/1,2,3,4 பட்டா பூமி உள்ளது.

புல எண்.152/4 - இன் செக்குபந்தி விபரம்

1. வடக்கு : புல எண்.152/3 பட்டா பூமி உள்ளது.
2. தெற்கு : புல எண்.149 பட்டா பூமி உள்ளது
3. மேற்கு : புல எண்.151 பட்டா பூமி உள்ளது
4. கிழக்கு : புல எண்.154 பட்டா பூமி உள்ளது.

இந்நேர்வில் குவாரி உரிமம் கோரும் புலத்திற்கு அருகில் 60 மீட்டர் தொலைவில் காப்பு காடுகள் உள்ளதால் குரும்பாளையம் கிராமம், புல எண்.151 - இல் பு.ஹெக் 2.16.00 ஏர்ஸ் பாப்பு பூமியில் பு.ஹெக் 1.29.90 ஏர்ஸ் பாப்பு மற்றும் 152/4-இல் பு.ஹெக் 0.98.50 ஏர்ஸ் ஆக மொத்தம் பு.ஹெக்டேர் 2.28.40 ஏர்ஸ் பரப்பளவில் உள்ள புலத்தில் சாதாரண கற்கள் / கிராவல் மண் வெட்டி எடுக்க 10 வருடங்களுக்கு குவாரி குத்தகை உரிமம் கோரியது தொடர்பாக ஈரோடு புவியியல் மற்றும் சுரங்கத்துறையின் துணை இயக்குநரின் தணிக்கை மற்றும் அறிக்கையின் அடிப்படையிலும், சத்தியமங்கலம் மாவட்ட வன அலுவலரின் கருத்துரு பெற்றும் தமிழ்நாடு சிறு கனிம சலுகை விதிகள் 1959 - இன் படியும், கீழ்க்கண்ட நிபந்தனைகளுக்குட்பட்டும் நடவடிக்கை மேற்கொள்ளலாம் என்பதை பணிவுடன் தெரிவித்துக் கொள்கிறேன்.

நிபந்தனைகள்:

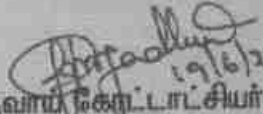
1. விண்ணப்ப புலத்தினைச் சுற்றியுள்ள பட்டா நிலங்களுக்கு அருகே 7.5 மீட்டர் பாதுகாப்பு இடைவெளி விட்டு மண் எடுக்க வேண்டும்.
2. வாரிக்கு அருகே உள்ள பகுதியில் 10 மீட்டர் பாதுகாப்பு இடைவெளி விட்டு மண் எடுக்க வேண்டும்.
3. கால்வாய் மற்றும் கிணறு உள்ள பகுதிகளுக்கு அருகில் 50 மீட்டர் பாதுகாப்பு இடைவெளி விட்டு மண் எடுத்தல் வேண்டும்.
4. அருகில் உள்ள பட்டா மற்றும் அரசு புறம்போக்கு நிலங்களில் எவ்வித ஆக்கிரமிப்பின்றியும், கிராம மக்களுக்கு எவ்வித இடையூறுமின்றியும் பணியினை மேற்கொள்ள வேண்டும்.
5. இந்த அனுமதியை பயன்படுத்தி வேறு இடத்திலிருந்து கனிமங்களையோ மற்றும் குறிப்பிட்ட கனிமத்திற்கு பதிலாக வேறு கனிமங்களையோ எடுத்துச் செல்லக் கூடாது.
6. மனுதாரர் இந்த அனுமதியினை வேறு எவருக்கும் உள் குத்தகைக்கு விடக் கூடாது.




7. குவாரிப்பணி ஆரம்பிப்பதற்கு முன்னதாக புலங்களின் எல்லையைக் கற்றிலும் முன் கம்பி வேலி அமைக்கப்பட வேண்டும்.

8. தமிழ்நாடு சிறுவகை கனிம சலுகை விதிகள் 1959 - இல் கண்டுள்ள விதிகள் மற்றும் அவ்வப்போது அறிவிக்கும் சட்டதிட்டங்களுக்கு உட்பட்டு குவாரிப்பணி புரிய வேண்டும்.

இணைப்பு: விசாரணை அறிக்கை

  
19/6/23  
வருவாய் கெட்டுடாட்சியர்,  
கோபிசெட்டிபாளையம்.

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19/6/23

கோபிசெட்டிபாளையம் வருவாய் கோட்டாட்சியரின் தணிக்கை குறிப்பு

வட்டம் : சத்தியமங்கலம்  
கிராமம் : குரும்பாளையம் கிராமம்  
புல எண் : 151 மற்றும் 152/4 ( 2.28.40 ஹெக்டேர் )  
நாள் : 07.06.2023

ஈரோடு மாவட்டம், சத்தியமங்கலம் வட்டம், குரும்பாளையம் கிராமம், புல எண்.151 - இல் பு.ஹெக் 2.16.00 ஏர்ஸ் பரப்பு பூமியில் பு.ஹெக் 1.29.90 ஏர்ஸ் பரப்பு மற்றும் 152/4-இல் பு.ஹெக் 0.98.50 ஏர்ஸ் ஆக மொத்தம் பு.ஹெக்டேர் 2.28.40 ஏர்ஸ் பரப்பளவில் உள்ள புலத்தில் சாதாரண கற்கள் / கிராவல் மண் வெட்டி எடுக்க 10 வருடங்களுக்கு குவாரி குத்தகை உரிமம் கோரி திரு.என்.டி.சாய்சதா, த.பெ.தியாகராஜன் என்பவர் மனு செய்தது தொடர்பாக 07.06.2023 அன்று என்னால் தணிக்கை செய்யப்பட்டது. தணிக்கையின் போது சார்நிலை அலுவலர்கள் உடனிருந்தனர்.

குவாரி குத்தகை உரிமம் அனுமதி வழங்க கோரும் புல எண்.151 பு.ஹெக்டேர் 2.16.00 ஏர்ஸ் பரப்பானது பு.புளியம்பட்டி சார்பதிவக கிரைய ஆவண எண்.2026/2017, நாள்: 14.07.2017 மற்றும் புல எண்.152/4- இல் பு.ஹெக்டேர் 0.98.50 ஏர்ஸ் பரப்பானது புஞ்சை புளியம்பட்டி சார்பதிவக கிரைய ஆவண எண்.2028/2017, நாள்: 14.07.2017 - இன் படி திரு.என்.டி.சாய்சதா, த.பெ.தியாகராஜன் என்பவருக்கு தனியாக பாத்தியப்பட்டுள்ளது.குவாரி குத்தகை உரிமம் அனுமதி வழங்க கோரும் புல எண்.151 மற்றும் புல எண்.152/4 ஆகிய காலைகளில் குவாரிகள் அமையப்பெறும் எல்லைகள் புஞ்சை புளியம்பட்டி உள்வட்ட அளவரால் அளவிட்டு செய்யப்பட்டு நான்கு புறமும் எல்லை கற்கள் நடப்பட்டுள்ளது. மேற்படி புலங்களிலிருந்து 50 மீட்டர் சுற்றளவிற்குள் இரயில் பாதைகள், ஆறுகள், குளங்கள், நீர்த்தேக்கங்கள் மற்றும் இதர நிரந்தர கட்டுமானங்கள் ஏதும் இல்லை. மேலும் இப்புலத்தில் புராதானச் சின்னங்கள், கோவில், மயானம், சர்ச்சுகள் ஆக்கிரமிப்புகள், உயர்மின்னழுத்த கம்பிகள், விலை மதிப்புள்ள மரங்கள் ஏதுமில்லை. இந்நேர்வில் குவாரி உரிமம் கோரும் புலத்திற்கு அருகில் 60 மீட்டர் தொலைவில் காப்பு காடுகள் உள்ளதால் ஈரோடு புவியியல் மற்றும் சுரங்கத்துறையின் துணை இயக்குநரின் தணிக்கை மற்றும் அறிக்கையின் அடிப்படையிலும், சத்தியமங்கலம் மாவட்ட வள அலுவலரின் கருத்துரு பெற்றும், தமிழ்நாடு சிறு கனிம சலுகை விதிகள் 1959 - இன் படியும் நடவடிக்கை மேற்கொள்ளலாம் என ஈரோடு மாவட்ட ஆட்சித்தலைவர் அவர்களுக்கு கடித வரைவு தயார் செய்து வைக்கவும்.

(07.06.23)  
7/6/23  
வருவாய் கோட்டாட்சியர்,  
கோபிசெட்டிபாளையம்.

அனுப்புதல்

திரு.நா.வெங்கடேஷ் பிரபு, இ.வ.ப.,  
துணை இயக்குநர்(மு.கூ.பொ),  
சத்தியமங்கலம் வனக்கோட்டம்,  
சத்தியமங்கலம் புலிகள் காப்பகம்,  
சத்தியமங்கலம் - 638 402.

பெறுதல்

உதவி இயக்குநர்,  
புவியியல் மற்றும் சுரங்கத்துறை,  
ஈரோடு.

ந.க.எண்.2053/2023/வ, நாள்: 30-06-2023

ஐயா,

பொருள் : வனம் - கனிமங்களும் சுரங்கங்களும் - ஈரோடு மாவட்டம் - சத்தியமங்கலம் வட்டம், குரும்பாளையம் கிராமம்- புல எண். 151 (பகுதி) மற்றும் 152/4 ஆகியவற்றில் 2.28.40 ஹெக்டேர் பட்டா நிலத்தில் 10 வருடங்களுக்கு குவாரி குத்தகை உரிமம் வழங்க சத்தியமங்கலம் புலிகள் காப்பகம் (Eco Sensitive Zone) எல்லையிலிருந்து எவ்வளவு தொலைவில் பிரஸ்தாப புலம் உள்ளது என்ற விபரம் - அறிக்கை சமர்ப்பித்தல் - தொடர்பாக.

பார்வை : துணை இயக்குநர், புவியியல் மற்றும் சுரங்கத்துறை, ஈரோடு  
ந.க.எண்.152/கனிமம்/2023 நாள்.23.03.2023

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மேற்காண் பொருள் தொடர்பாக, பார்வையில் கண்ட கடிதத்தில் ஈரோடு மாவட்டம் சத்தியமங்கலம் வட்டம், குரும்பாளையம் கிராமம்- புல எண். 151 (பகுதி) மற்றும் 152/4 ஆகியவற்றில் 2.28.40 ஹெக்டேர் பட்டா நிலத்தில் 10 வருடங்களுக்கு குவாரி குத்தகை உரிமம் வழங்க சத்தியமங்கலம் புலிகள் காப்பகத்தின் Eco Sensitive Zone எல்லையிலிருந்து எவ்வளவு தொலைவில் பிரஸ்தாப புலம் அமைந்துள்ள என்ற விபரம் கேட்கப்பட்டிருந்தது. மேற்படி இடத்தினை களத்தணிக்கை மேற்கொண்டு பின்வரும் விபரங்கள் தெரிவிக்கப்படுகிறது.

விபரங்கள்:

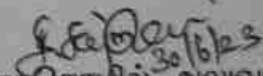
குவாரி அமைக்கப்பட உள்ள புல எண்.151 (பகுதி) இடமானது சத்தியமங்கலம் வனக்கோட்டம், விளாமுண்டி வனச்சரகம், விளாமுண்டி பிரிவு, விளாமுண்டி காப்புக்காடு, விளாமுண்டி கிழக்கு காவல் சுற்றுக்குட்பட்ட போலக்கரடு சராக வன எல்லைப்பகுதியிலிருந்து 60 மீட்டர் தொலைவிலும், சத்தியமங்கலம் புலிகள் காப்பகம், சத்தியமங்கலம் வனக்கோட்டம், விளாமுண்டி வனச்சரகம், நீலகிரி கிழக்கு சரிவு காப்புக்காடு, பட்ரமங்கலம் பிரிவு, பட்ரமங்கலம் காவல் சுற்றிலிருந்து 8.77 கி.மீ தொலைவிலும், சத்தியமங்கலம் புலிகள் காப்பகம் சூழல் உணர்திறன் மண்டலத்திலிருந்து (Eco Sensitive Zone) 7.77 கி.மீ தொலைவிலும் அமைந்துள்ளது.

மேலும் புல எண்.152/4 -ல் உள்ள இடமானது சத்தியமங்கலம் வனக்கோட்டம், விளாமுண்டி வனச்சரகம், விளாமுண்டி பிரிவு, விளாமுண்டி காப்புக்காடு, விளாமுண்டி கிழக்கு காவல் சுற்றுக்குட்பட்ட போலக்கரடு சராக வன எல்லைப்பகுதியிலிருந்து 200மீட்டர் தொலைவிலும், சத்தியமங்கலம் புலிகள் காப்பகம், சத்தியமங்கலம் வனக்கோட்டம், விளாமுண்டி வனச்சரகம், நீலகிரி கிழக்கு சரிவு காப்புக்காடு, பட்ரமங்கலம் பிரிவு, பட்ரமங்கலம் காவல் சுற்றிலிருந்து 8.93 கி.மீ தொலைவிலும், சத்தியமங்கலம் புலிகள் காப்பகம் சூழல் உணர்திறன் மண்டலத்திலிருந்து (Eco Sensitive Zone) 7.93 கி.மீ தொலைவிலும் அமைந்துள்ளது. மேலும் கல்குவாரி குத்தகை உரிமம் கோரும் இடங்களானது சத்தியமங்கலம் புலிகள் காப்பகம் சூழல் உணர்திறன் மண்டலத்திலிருந்து (ECO Sensitive Zone) வெளியில் உள்ளது என்பதை தெரிவித்துக்கொள்கிறேன்.

ஓம்/-நா.வெங்கடேஷ் பிரபு,  
துணை இயக்குநர்(மு.சு.பொ)  
சத்தியமங்கலம் வனக்கோட்டம்.

நகல்: வனச்சரக அலுவலர், விளாமுண்டி வனச்சரகம்.

// உண்மை நகல் // உத்திரவுப்படி //

  
வரைதொழில் அலுவலர்

ஈ.ஆர்.சி. லாபலிபு ஈ.ஆர்.சி. வல்லி கஞ்சி  
 லாபலிபு ஈ.ஆர்.சி. (கி.ஆர்.சி.) 3வது கட்டியில் உரித்தாகும்  
 P. S. சி.ஆர்.சி. லாபலிபு N.T. சி.ஆர்.சி. லாபலிபு

ஈ.ஆர்.சி. லாபலிபு சத்தியமங்கலம் வல்லி

சி.ஆர்.சி. லாபலிபு ஈ.ஆர்.சி. கண் 151 மற்றும்  
 152/4 கல் ஈ.ஆர்.சி. 2.28.40 உரித்தாகும் கண்  
 சி.ஆர்.சி. லாபலிபு 2026/2017, 2028/2017  
 கண் 14-08-2017ல் பி.ஆர்.சி. லாபலிபு சத்தியமங்கலம்  
 சி.ஆர்.சி. லாபலிபு. சி.ஆர்.சி. லாபலிபு சத்தியமங்கலம்  
 ஈ.ஆர்.சி. லாபலிபு சத்தியமங்கலம் சத்தியமங்கலம்  
 சி.ஆர்.சி. லாபலிபு சத்தியமங்கலம் சத்தியமங்கலம்  
 சி.ஆர்.சி. லாபலிபு சத்தியமங்கலம் சத்தியமங்கலம்  
 சி.ஆர்.சி. லாபலிபு சத்தியமங்கலம் சத்தியமங்கலம்  
 சி.ஆர்.சி. லாபலிபு சத்தியமங்கலம் சத்தியமங்கலம்  
 சி.ஆர்.சி. லாபலிபு சத்தியமங்கலம் சத்தியமங்கலம்  
 சி.ஆர்.சி. லாபலிபு சத்தியமங்கலம் சத்தியமங்கலம்  
 சி.ஆர்.சி. லாபலிபு சத்தியமங்கலம் சத்தியமங்கலம்  
 சி.ஆர்.சி. லாபலிபு சத்தியமங்கலம் சத்தியமங்கலம்  
 சி.ஆர்.சி. லாபலிபு சத்தியமங்கலம் சத்தியமங்கலம்  
 சி.ஆர்.சி. லாபலிபு சத்தியமங்கலம் சத்தியமங்கலம்



கிராம நிர்வாக அலுவலர்  
 44. விண்ணப்பள்ளி,  
 43. குருப்பாளையம்,  
 சத்தியமங்கலம் வட்டம்

**TOPOGRAPHICAL VIEW OF KURUMBAPALAYAM ROUGH STONE  
AND GRAVEL QUARRY LEASE APPLIED AREA**




Name of the Applicant : **Thiru. N.T. Saisada,**  
**S/o. Thyagaraj.**


Address : No. 12, Gandhiji 3rd Street,  
Karur Bypass, Erode District,  
Tamil Nadu State- 638 002.

**Location:**

S.F.Nos. : 151 (Part) and 152/4  
Extent : 2.28.40 Ha  
Village : Kurumbapalayam  
Taluk : Sathyamangalam  
District : Erode

Signature of the Applicant

  
(N.T. Saisada)

  
(Village Administrator, Kurumbapalayam)  
44. விண்ணப்பள்ளி,  
43. குரும்பாபாளையம்,  
சத்தியமங்கலம் வட்டம்.



Government of India  
Ministry of Environment, Forest and Climate Change  
(Issued by the State Environment Impact Assessment  
Authority(SEIAA), TAMIL NADU)

To,

The -1

CHINNASAMY NAIDU RAJA

No. 25/12,Jai Nager,Thanneer Panthal , Peelamedu, Coimbatore District. -  
641004

**Subject:** Grant of Environmental Clearance (EC) to the proposed Project Activity  
under the provision of EIA Notification 2006-regarding

Sir/Madam,

This is in reference to your application for Environmental Clearance (EC)  
in respect of project submitted to the SEIAA vide proposal number  
SIA/TN/MIN/422261/2023 dated 22 Jun 2023. The particulars of the environmental  
clearance granted to the project are as below.

- |   |   |
|---|---|
| 1. EC Identification No.                      | EC23B001TN129700  |
| 2. File No.                                   | 9916  |
| 3. Project Type                               | New   |
| 4. Category                                   | B   |
| 5. Project/Activity including<br>Schedule No. | 1(a) Mining of minerals   |
| 6. Name of Project                            | C.Raja Extent: 1.41.96Ha S.F.Nos.<br>138/2A (P), 138/3A (P) & 138/4 (P),<br>Kurumbapalayam Village,<br>Sathyamangalam Taluk,Erode District<br>,Tamil Nadu State |
| 7. Name of Company/Organization               | CHINNASAMY NAIDU RAJA   |
| 8. Location of Project                        | TAMIL NADU  |
| 9. TOR Date                                   | N/A   |

The project details along with terms and conditions are appended herewith from page  
no 2 onwards.

Date: 27/12/2023

(e-signed)  
Thiru.Deepak S.Bilgi  
Member Secretary  
SEIAA - (TAMIL NADU)

*Note: A valid environmental clearance shall be one that has EC identification  
number & E-Sign generated from PARIVESH.Please quote identification  
number in all future correspondence.*

*This is a computer generated cover page.*





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

STATE LEVEL ENVIRONMENT IMPACT  
ASSESSMENT AUTHORITY-TAMILNADU

3<sup>rd</sup> Floor, Panagal Maaligai,  
No.1, Jeenis Road, Saidapet,  
Chennai - 600 015.  
Phone No. 044-24359973  
Fax No. 044-24359975

**ENVIRONMENTAL CLEARANCE**

**Lr.No. SEIAA-TN/F.No.9916/1(a)/EC. No:6157/2023, dated: 07.11.2023**

Sir/Madam,

**Sub:** SEIAA-TN – Proposed Rough Stone and Gravel quarry over an extent of 1.41.96 Ha at S.F.Nos. 138/2A (P), 138/3A (P) & 138/4 (P) of Kurumbapalayam Village, Sathyamangalam Taluk, Erode District, Tamil Nadu by Thiru. C. Raja under project category - "B2" and Schedule S.No. 1(a) – Issue of Environmental Clearance – Regarding.

- Ref:** 1. Online Proposal No. SIA/TN/MIN/422261/2023, dated: 16.03.2023  
2. Application seeking Environmental Clearance dated: 20.03.2023  
3. Minutes of the 386<sup>th</sup> SEAC meeting held on 23.06.2023  
4. Minutes of the 636<sup>th</sup> SEIAA meeting held on 10.07.2023  
5. Proponent reply dated: 04.08.2023  
6. Minutes of the 645<sup>th</sup> SEIAA meeting held on 08.08.2023  
7. Minutes of the 417<sup>th</sup> SEAC meeting held on 18.10.2023  
8. Minutes of the 671<sup>st</sup> SEIAA meeting held on 07.11.2023

**Details of Minor Mineral Activity: -**

This has reference to your application 1<sup>st</sup> & 2<sup>nd</sup> cited. The proposal is for obtaining Environmental Clearance for mining / quarrying of minor minerals based on the particulars furnished in your application as shown below.

| Sl. No | Salient Features of the Proposal |   |
|--------|----------------------------------|---|
| 1.     | Name of the Owner/Firm           | Thiru. C. Raja,<br>No.25/12, Jai Nagar, |

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|     |   |   |
|-----|---|---|
|     |   | Thanneer Panthal, Peelamedu,<br>Coimbatore District - 641 004.              |
| 2.  | Type of quarrying   | Rough Stone and Gravel  |
| 3.  | S.F Nos. of the quarry site   | 138/2A (P), 138/3A (P) & 138/4 (P)  |
| 4.  | Village in which situated   | Kurumbapalayam  |
| 5.  | Taluk in which situated   | Sathyamangalam  |
| 6.  | District in which situated  | Erode   |
| 7.  | Extent of quarry (in ha.)   | 1.41.96 Ha  |
| 8.  | Latitude & Longitude of all corners of the quarry site  | 11°25'37.78"N to 11°25'41.55"N<br>77°10'01.38"E to 77°10'06.08"E            |
| 9.  | Topo Sheet No.  | 58-E/03   |
| 10. | Type of mining  | Opencast Mechanized Mining  |
| 11. | Period of Current Mine Plan   | 5 Years   |
| 12. | Production (Quantity in m <sup>3</sup> )  | 1,19,897 m <sup>3</sup> of Rough Stone and<br>7230 m <sup>3</sup> of Gravel |
| 13. | Depth of Quarrying  | 40m bgl   |
| 14. | Depth of water table  | 70m-65m bgl   |
| 15. | Man Power requirement per day:  | 18 Nos.   |
| 16. | Water requirement:  | 1.2 KLD   |
|     | i) Drinking Water & Domestic Purpose  | 0.3 KLD   |
|     | ii) Dust suppression  | 0.5 KLD   |
|     | iii) Green belt   | 0.4 KLD   |
| 17. | Power requirement   | TNEB<br>99,760 Liters of HSD  |
| 18. | Precise area communication approved by the Deputy Director, Dept. of Geology and Mining with date | Na.Ka.7837/Kanimam/2018, Dated:09.02.2023                                   |
| 19. | Mining Plan approved by the Deputy Director, Dept. of Geology and Mining with date                | R.c. No. 7387/Mines/2018, Dated: 21.02.2023                                 |
| 20. | 500m cluster letter issued by the Deputy Director, Dept. of Geology and Mining with date          | R.c. No. 7387/Mines/2018, Dated: 27.07.2023                                 |

  
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|     |   |  |
|-----|---|--|
| 21. | VAO certificate regarding structures within 300m radius | Letter dated 13.02.2023  |
| 22. | Project Cost (excluding EMP cost)                       | Rs. 37,90,000/-  |
| 23. | EMP cost (in Rs. Lakh)                                  | Capital Cost – Rs. 22,21,292/-<br>Recurring Cost – Rs. 13,99,896/- |
| 24. | CER cost (in Rs. Lakh)                                  | Rs. 5,00,000/-   |

**Validity:**

**This Environmental Clearance is accorded for the quantity of 1,19,897 m<sup>3</sup> of Rough Stone and 7230 m<sup>3</sup> of Gravel up to the ultimate depth of 40m below ground level and the annual peak production should not exceed 26,080 m<sup>3</sup> of Rough Stone and 4526 m<sup>3</sup> of Gravel.**


**The Environmental Clearance issued is valid as per the approved mine plan period and as per MoEF&CC's notification S.O.1533(E) dated 14.09.2006 and S.O. 1807(E) dated 12.04.2022.**

**AFFIDAVIT FURNISHED BY THE PROPONENT**

The Proponent has furnished affidavit in stamp paper attested by the Notary stating that I, C. Raja, No. 25/12, Jai Nagar, Thanneer Panthal, Peelamedu, Coimbatore District – 641 004, solemnly declare and sincerely affirm that:

I have apply for getting Environment Clearance to SEIAA, Tamil Nadu State for quarry lease for quarrying of Rough Stone and Gravel Quarry Project at over an Extent of 1.41.96ha of Patta lands in 138/2A (P), 138/3A (P) & 138/4 (P) of Kurumbapalayam Village, Sathiyamangalam Taluk, Erode District, Tamil Nadu State.

1. I swear to state and confirm that within 10km area of the quarry site, I have applied for environment clearance, none of the following is situated:
  - a. Protected areas notified under the wild life (Protection) Act, 1972,
  - b. Critically polluted areas as notified by the central pollution control board constituted under water (Prevention and Control of Pollution) Act, 1974,
  - c. Eco-Sensitive areas as notified.
  - d. Interstate Boundary
2. I will spend the amount of Rs.5 Lakhs towards Corporate Environment Responsibility (Revised CER) for the following activities to the Panchayat Union Primary School, Panayampalli, Bhavani Sagar Taluk, Erode District, before commencement of quarrying activities.

  
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| Sl. No.      | Description  | Cost break up        |
|--------------|--|----------------------|
| 1            | Renovation of Existing toilets and maintenance   | 5,00,000/-           |
| 2            | Providing drinking water facilities to the students by installing (R.O) water Purifier |                      |
| 3            | Repairing works on electricity lines and boards in the school                          |                      |
| 4            | Providing environmental related books to school library                                |                      |
| 5            | Carrying out plantation in around school 150 Nos                                       |                      |
| <b>TOTAL</b> |  | <b>Rs.5,00,000/-</b> |

3. The total area of following quarries located within 500m radius from the periphery of my quarry site details as shown below:

**1. Existing Quarries:**

| Sl. No | Name of the Applicant | S.F. Nos.     | Extent in Hect | Lease Period |
|--------|-----------------------|---------------|----------------|--------------|
| 1.     |                       | -----NIL----- |                |              |

**2. Expired Quarries**

| Sl. No | Name of the Applicant | S.F. Nos.                                  | Extent in Hect | Remarks     |
|--------|-----------------------|--|----------------|-------------|
| 1.     | C. Raja               | 138/2A (P),<br>138/3A (P) and<br>138/4 (P) | 1.41.96 hect   | Fresh lease |

**3. Abandoned quarries**

| Sl. No | Name of the Applicant | S.F. Nos.           | Extent in Hect | Lease Period                |
|--------|-----------------------|---------------------|----------------|-----------------------------|
| 1.     | M. Ramasamy           | 139/2, 139/3, 139/4 | 3.13.5         | 10.08.2016 to<br>09.08.2021 |

4. There will not be hindrance or disturbance to the people living during quarrying activities and transportation of the mineral.
5. There is no approved habitation within 300m radius from the periphery of my quarry.
6. I swear that afforestation will be carried out during the course of quarrying operation and maintained.
7. The required insurance will be taken in the name of the laborers working in my quarry site.

  
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8. The existing road from the main road to quarry is in good condition and the same is being maintained and utilized for Transportation of Rough stone.
9. I will not engage any child labor in my quarry site and I aware that engaging child labor is punishable under the law.
10. All types of safety / protective equipment will be provided to all the laborers working in my quarry.
11. No permanent structures, temples etc., are located within 500m radius from the periphery of my quarry.

**REVISED EMP BUDGET**

| <b>Activities</b>   | <b>Capital Cost</b> | <b>Recurring Cost</b> |
|---|---------------------|-----------------------|
| Air Environment   | 2221292             | 1399896               |
| Noise Environment   |                     |                       |
| Waste Management  |                     |                       |
| Mine Closure  |                     |                       |
| Implementation of EC, Mining Plan & DGMS Condition- Public hearing commitment |                     |                       |
| CER   |                     |                       |

**EMP BUDGET SUMMARY BREAKUP YEAR WISE UP TO LEASE PERIOD**

| <b>Year</b>          | <b>Total Cost</b> |
|----------------------|-------------------|
| 1 <sup>st</sup> Year | ₹ 36,21,188/-     |
| 2 <sup>nd</sup> Year | ₹ 14,69,891/-     |
| 3 <sup>rd</sup> Year | ₹ 15,43,386/-     |
| 4 <sup>th</sup> Year | ₹ 16,20,555/-     |
| 5 <sup>th</sup> Year | ₹ 17,97,883/-     |

I ensure to do all the social and Environment commitment as mentioned in the scheme of mining to the best of my knowledge.

**DETAILS OF QUARRIES LOCATED WITHIN 500M RADIUS FROM THE PROPOSED QUARRY:**

The Project Proponent has submitted a copy of the letter obtained from the Deputy Director, Department of Geology and Mining, Erode District in his letter R.c. No. 7387/Mines/2018, Dated: 27.07.2023 has stated that the details of other quarries within a radius 500m from the boundary of the proposed quarry site as follows:

  
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1. Existing quarries:

| Sl. No | Name of the Applicant | S.F. Nos.       | Extent (Hect) | Lease Details  |
|--------|-----------------------|-----------------|---------------|--|
| 1.     | N.T. Saisadha         | 152/2 and 152/3 | 1.64.5 Hect   | R.C. No. 22023/2017/X-1 dated 23.12.2021, (23.12.2021 to 22.12.2026) |

2. Proposed quarries:

| Sl. No | Name of the Applicant | S.F. Nos.                               | Extent (Hect) | Date of application               |
|--------|-----------------------|---|---------------|-----------------------------------|
| 1.     | C. Raja               | 138/2A(P), 138/3A(P) and 138/4(P)       | 1.41.96 Hect  | 24.03.2018 (Mining Plan approved) |
| 2.     | Thirunavukarasu       | 148/1, 148/11, 148/12, 148/13 and 157/1 | 2.18.0        | 02.05.2022                        |
| 3.     | N.T. Saisadha         | 151 (part) and 152/4                    | 2.28.40 Hect  | 16.03.2023                        |

3. Lease expired and abandoned quarries:

| Sl. No | Name of the Applicant | S.F. Nos.           | Extent (Hect) | Lease Period             |
|--------|-----------------------|---------------------|---------------|--------------------------|
| 1.     | M. Ramasamy           | 139/2, 139/3, 139/4 | 3.13.5        | 10.08.2016 to 09.08.2021 |

**DISCUSSION BY SEIAA AND THE REMARKS: -**

The subject was placed in the 671<sup>st</sup> authority meeting held on 07.11.2023. The authority noted that the subject was appraised in the 417<sup>th</sup> SEAC meeting held on 18.10.2023. SEAC has furnished its recommendations for granting Environmental Clearance subject to the conditions stated therein.

After detailed discussions, the Authority taking into account the recommendations of SEAC and also the safety aspects and to ensure sustainable, scientific and systematic mining, decided to grant Environmental Clearance for the quantity of 1,19,897 m<sup>3</sup> of Rough Stone & 7230 m<sup>3</sup> of Gravel up to the ultimate depth of 40m below ground level and the annual peak production should not exceed 26,080 m<sup>3</sup> of Rough Stone and 4526 m<sup>3</sup> of Gravel. This is also subject to the conditions imposed by SEAC, normal conditions stipulated by MOEF&CC in addition to the following conditions and the conditions in Annexure 'A' of this minutes.

1. Keeping in view of MoEF&CC's notification S.O.1533(E) dated.14.09.2006 and S.O. 1807(E) dated 12.04.2022, this Environmental Clearance is valid as per the approved mine plan period.

  
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2. The EC granted is subject to review by District Collector, Mines Dept. and TNPCB on completion of every 5 years and also during the mine plan period, till the project life so as to review the EC conditions and to ensure that they have all been adhered to and implemented.
3. The project proponent shall submit a Certified Compliance Report obtained from IRO of MoEF&CC to the monitoring, regulatory and other concerned authorities including SEIAA, while seeking a renewal of the mining plan to cover the project life.
4. There should be regular monitoring of air quality, water quality, ground water level and noise quality and reports regarding the same should be submitted to TNPCB, SEIAA & IRO of MoEF&CC once in every 6 months.
5. The proponent shall strictly adhere to the mining plan and half yearly and annual returns shall be submitted to the Director of Geology and Mining Department with copy marked to TNPCB, SEIAA & IRO of MoEF&CC.
6. Biodiversity in and around the project area should be monitored frequently and detailed biodiversity report should be submitted every year to SEIAA & IRO of MoEF&CC.
7. The progressive and final mine closure plan including the green belt implementation and environmental norms should be strictly followed as per the EMP and as per the amount committed and approved in EC for EMP. Status of progressive mine closure and green belt implementation should be included in the half yearly compliance report submitted to TNPCB, SEIAA & IRO of MoEF&CC.
8. As per the OM vide F. No. IA3-22/1/2022-IA-III [E- 172624] Dated: 14.06.2022, the Project Proponents are directed to submit the six-monthly compliance on the environmental conditions prescribed in the prior environmental clearance letter(s) through newly developed compliance module in the PARIVESH Portal from the respective login.
9. The amount allocated for EMP should be kept in a separate account and both the capital and recurring expenditures should be done year wise for the works identified, approved and as committed. The work & expenditure made under EMP should be elaborated in the bi-annual compliance report submitted and also should be brought to the notice of concerned authorities during inspections.

  
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**Annexure 'A'**

**a) EC Compliance**

1. The Environmental Clearance is accorded based on the assurance from the project proponent that there will be full and effective implementation of all the undertakings given in the Application Form, Pre-feasibility Report, mitigation measures as assured in the Environmental Impact Assessment/ Environment Management Plan and the mining features including Progressive Mine Closure Plan as submitted with the application.
2. All the conditions as presented by the proponent in the PPT during SEAC appraisal should be addressed in Full.
3. The proponent shall submit Compliance Reports on the status of compliance of the stipulated EC conditions including results of monitored data. It shall be sent to the respective Regional Office of Ministry of Environment, Forests and Climate Change, Govt. of India and also to the Office of State Environment Impact Assessment Authority (SEIAA).
4. Concealing the factual data or submission of false/fabricated data and failure to comply with any of the conditions mentioned above may result in withdrawal of this clearance and attract action under the provisions of Environment (Protection) Act, 1986.

**b) Applicable Regulatory Frameworks**

5. The project proponent shall strictly adhere to the provisions of Water (Prevention & Control of Pollution) Act, 1974, the Air (Prevention & Control of Pollution) Act, 1981, the Environment (Protection) Act, 1986, the Public Liability Insurance Act, 1991, along with their amendments, Minor Mineral Conservation & Development Rules, 2010 framed under MMDR Act 1957, National Commission for protection of Child Right Rules, 2006, Wildlife Protection Act, 1972, Forest Conservation Act, 1980, Biodiversity Conservation Act, 2016, the Biological Diversity Act, 2002, Biological diversity Rules, 2004 & TN Forest Act, 1882 and Rules made there under and also any other orders passed by the Hon'ble Supreme Court of India/Hon'ble High Court of Madras and any other Courts of Law relating to the subject matter

  
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**c) Safe mining Practices**

6. The AD/DD, Dept. of Geology & Mining shall ensure operation of the proposed quarry after the submission slope stability study conducted through the reputed research & Academic Institutions such as NIRM, IITs, NITS Anna University, and any CSIR Laboratories etc.
7. The AD/DD, Dept. of Geology & Mining & Director General of Mine safety shall ensure strict compliance and implementation of bench wise recommendations/action plans as recommended in the scientific slope stability study of the reputed research & Academic Institutions as a safety precautionary measure to avoid untoward accidents during mining operation.
8. A minimum buffer distance specified as per existing rules and statutory orders shall be maintained from the boundary of the quarry to the nearest dwelling unit or other structures, and from forest boundaries or any other ecologically sensitive and archeologically important areas or the specific distance specified by SEIAA in EC as per the recommendations of SEAC depending on specific local conditions.

**d) Water Environment – Protection and mitigation measures**

9. The proponent shall ensure that the activity does not disturb the water bodies and natural flow of surface and groundwater, nor cause any pollution, to water sources in the area.
10. The proponent shall ensure that the activities do not impact the water bodies/wells in the neighboring open wells and bore wells. The proponent shall ensure that the activities do not in any way affect the water quantity and quality in the open wells and bore wells in the vicinity or impact the water table and levels. The proponent shall ensure that the activities do not disturb the river flow, nor affect the Odai, Water bodies, Dams in the vicinity.
11. Water level in the nearest dug well in the downstream side of the quarry should be monitored regularly and included in the Compliance Report.
12. Quality of water discharged from the quarry should be monitored regularly as per the norms of State Pollution Control Board and included in the Compliance Report.
13. Rain Water Harvesting facility should be installed as per the prevailing provisions of TNMBR/TNCDBR, unless otherwise specified. Maximum possible solar energy generation and utilization shall be ensured as an essential part of the project.

  
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14. Regular monitoring of flow rates and water quality upstream and downstream of the springs and perennial nallahs flowing in and around the mine lease area shall be carried out and reported in the compliance reports to SEIAA.
15. Regular monitoring of ground water level and water quality shall be carried out around the mine area during mining operation. At any stage, if it is observed that ground water table is getting depleted due to the mining activity; necessary corrective measures shall be carried out.
16. Garland drains and silt traps are to be provided in the slopes around the core area to channelize storm water. De-silting of Garland canal and silt traps have to be attended on a daily basis. A labour has to be specifically assigned for the purpose. The proponent shall ensure the quality of the discharging storm water as per the General Effluent Discharge Standards of CPCB.

**e) Air Environment – Protection and mitigation measures**

17. The activity should not result in CO<sub>2</sub> release and temperature rise and add to micro climate alternations.
18. The proponent shall ensure that the activities undertaken do not result in carbon emission, and temperature rise, in the area.
19. The proponent shall ensure that Monitoring is carried out with reference to the quantum of particulate matter during excavation; blasting; material transport and also from cutting waste dumps and haul roads.

**f) Soil Environment – Protection and mitigation measures**

20. The proponent shall ensure that the operations do not result in loss of soil biological properties and nutrients.
21. The proponent shall ensure that activity does not deplete the indigenous soil seed bank and disturb the mycorrhizal fungi, soil organism, soil community nor result in eutrophication of soil and water.
22. The activities should not disturb the soil properties and seed and plant growth. Soil amendments as required to be carried out, to improve soil health.
23. Bio remediation using microorganisms should be carried out to restore the soil environment to enable carbon sequestration.
24. The proponent shall ensure that the mine restoration is done using mycorrhizal VAM, vermin-composting, Biofertilizers to ensure soil health and biodiversity conservation.

  
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25. The proponent shall ensure that the topsoil is protected and used in planting activities in the area.
26. The proponent shall ensure that topsoil to be utilized for site restoration and Green belt alone within the proposed area.
27. The top soil shall be temporarily stored at earmarked place (s) and used for land reclamation and plantation. The over burden (OB) generated during the mining operations shall be stacked at earmarked dump site(s) only. The OB dumps should be scientifically vegetated with suitable native species to prevent erosion and surface run off. At critical points, use of geotextile shall be undertaken for stabilization of the dump. Protective wall or gabions should be made around the dump to prevent erosion / flow of sediments during rains. The entire excavated area shall be backfilled.
28. Activities should not result in invasion of site by exotic and alien plant and animal species and disturb the native biodiversity and soil micro flora and fauna.

**g) Noise Environment – Protection and mitigation measures**

29. The peak particle velocity at 500m distance or within the nearest habitation, whichever is closer shall be monitored periodically as per applicable DGMS guidelines.
30. The sound at project sites disturb the villages in respect of both human and animal population. Consequent sleeping disorders and stress may affect the health in the villages located close to mining operations. Hence, the PP shall ensure that the biological clock of the villages are not disturbed because of the mining activity.

**h) Biodiversity - Protection and mitigation measures**

31. The proponent should ensure that there is no disturbance to the agriculture plantations, social forestry plantations, waste lands, forests, sanctuary or national parks. There should be no impact on the land, water, soil and biological environment and other natural resources due to the mining activities.
32. No trees in the area should be removed and all the trees numbered and protected. In case trees fall within the proposed quarry site the trees may be transplanted in the Greenbelt zone. The proponent shall ensure that the activities in no way result in disturbance to forest and trees in vicinity. The proponent shall ensure that the activity does not disturb the movement of grazing animals and free ranging wildlife. The proponent shall ensure that the activity does not disturb the biodiversity, the flora &

  
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fauna in the ecosystem. The proponent shall ensure that the activity does not result in invasion by invasive alien species. The proponent shall ensure that the activities do not disturb the resident and migratory birds. The proponent shall ensure that the activities do not disturb the vegetation and wildlife in the adjoining reserve forests and areas around.

33. The proponent shall ensure that the activities do not disturb the agro biodiversity and agro farms. Actions to be taken to promote agroforestry, mixed plants to support biodiversity conservation in the mine restoration effort.
34. The proponent shall ensure that all mitigation measures listed in the EIA/EMP are taken to protect the biodiversity and natural resources in the area.
35. The proponent shall ensure that the activities do not impact green lands/grazing fields of all types surrounding the mine lease area which are food source for the grazing cattle.

**i) Climate Change**

36. The project activity should not in any way impact the climate and lead to a rise in temperature.
37. There should be least disturbance to landscape resulting in land use change, contamination and alteration of soil profiles leading to Climate Change.
38. Intensive mining activity should not add to temperature rise and global warming.
39. Operations should not result in GHG releases and extra power consumption leading to Climate Change.
40. Mining through operational efficiency, better electrification, energy use, solar usage, use of renewable energy should try to decarbonize the operations.
41. Mining Operation should not result in droughts, floods and water stress, and shortages, affecting water security both on site and in the vicinity.
42. Mining should not result in water loss from evaporation, leaks and wastage and should support to improve the ground water.
43. Mining activity should be flood proof with designs and the drainage, pumping techniques shall ensure climate-proofing and socio-economic wellbeing in the area and vicinity.

  
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**j) Reserve Forests & Protected Areas**

44. The activities should provide nature based support and solutions for forest protection and wildlife conservation.
45. The project activities should not result in forest fires, encroachments or create forest fragmentation and disruption of forest corridors.
46. There should be no disturbance to the freshwater flow from the forest impacting the water table and wetlands.
47. The project proponent should support all activities of the forest department in creating awareness to local communities on forest conservation.
48. The project activities should not alter the geodiversity and geological heritage of the area.
49. The activities should not result in temperature rise due to increased fossil fuels usage disrupting the behaviour of wildlife and flora.
50. The activities should support and recognise the rights and roles of indigenous people and local communities and also support sustainable development.
51. The project activities should support the use of renewables for carbon capture and carbon storage in the project site and forest surrounds.
52. The project activities should not result in changes in forest structure, habitats and genetic diversity within forests.

**k) Green Belt Development**

53. The proponent shall ensure that in the green belt development more indigenous trees species (Appendix as per the SEAC Minutes) are planted.
54. The proponent shall ensure the area is restored and rehabilitated with native trees as recommended in SEAC Minutes (in Appendix).

**l) Workers and their protection**

55. The project proponent is responsible for implementing all the provisions of labour laws applicable from time to time to quarrying /Mining operations. The workers on the site should be provided with on-site accommodation or facilities at a suitable boarding place, protective equipment such as ear muffs, helmet, etc.
56. The proponent has to provide insurance protection to the workers in the case of existing mining or provide the affidavit in case of fresh lease before execution of mining lease.

  
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57. The workers shall be employed for working in the mines and the working hours and the wages shall be implemented/enforced as per the Mines Act, 1952.

**m) Transportation**

58. No Transportation of the minerals shall be allowed in case of roads passing through villages/ habitations. In such cases, PP shall construct a bypass road for the purpose of transportation of the minerals leaving an adequate gap (say at least 200 meters) so that the adverse impact of sound and dust along with chances of accidents could be mitigated. All costs resulting from widening and strengthening of existing public road network shall be borne by the PP in consultation with nodal State Govt. Department. Transportation of minerals through road movement in case of existing village/ rural roads shall be allowed in consultation with nodal State Govt. Department only after required strengthening such that the carrying capacity of roads is increased to handle the traffic load. The pollution due to transportation load on the environment will be effectively controlled and water sprinkling will also be done regularly. Vehicular emissions shall be kept under control and regularly monitored. Project should obtain Pollution Under Control (PUC) certificate for all the vehicles from authorized pollution testing centers.

59. The Main haulage road within the mine lease should be provided with a permanent water sprinkling arrangement for dust suppression. Other roads within the mine lease should be wetted regularly with tanker-mounted water sprinkling system. The other areas of dust generation like crushing zone, material transfer points, material yards etc. should invariably be provided with dust suppression arrangements. The air pollution control equipments like bag filters, vacuum suction hoods, dry fogging system etc. shall be installed at Crushers, belt-conveyors and other areas prone to air pollution. The belt conveyor should be fully covered to avoid generation of dust while transportation. PP shall take necessary measures to avoid generation of fugitive dust emissions.

**n) Storage of wastes**

60. The project proponent shall store/dump the waste generated within the earmarked area of the project site for mine closure as per the approved mining plan.

  
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**o) CER/EMP**

61. The CER should be fully Implemented and fact reflected in the Half-yearly compliance report.
62. The EMP shall also be implemented in consultation with local self-government institutions & Govt. departments.
63. The follow-up action on the implementation of CER Shall be included in the compliance report.

**p) Directions for Reclamation of mine sites**

64. The mining closure plan should strictly adhere to appropriate soil rehabilitation measures to ensure ecological stability of the area. Reclamation/Restoration of the mine site should ensure that the Geotechnical, physical, chemical properties are sustainable that the soil structure composition is buildup, during the process of restoration.
65. The proponent shall ensure that the mine closure plan is followed as per the mining plan and the mine restoration should be done with native species, and site restored to near original status. The proponent shall ensure that the area is ecologically restored to conserve the ecosystems and ensure flow of goods and services.
66. A crucial factor for success of reclamation site is to select sustainable species to enable develop a self-sustaining eco system. Species selected should easily establish, grow rapidly, and possess good crown and preferably be native species. Species to be planted in the boundary of project site should be un palatable for cattle's/ goats and should have proven capacity to add leaf-litter to soil and decompose. The species planted should be adaptable to the site conditions. Should be preferably pioneer species, deciduous in nature to allow maximum leaf-litter, have deep root system, fix atmospheric nitrogen and improve soil productivity. Species selected should have the ability to tolerate altered pit and toxicity of and site. They should be capable of meeting requirement of local people in regard to fuel fodder and should be able to attract bird, bees and butterflies. The species should be planted in mixed association.
67. For mining area reclamation plot culture experiments to be done to identify/ determine suitable species for the site.

  
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68. Top soil with a mix of beneficial microbes (Bacteria/Fungi) to be used for reclamation of mine spoils. AM Fungi (Arbuscular mycorrhizal fungi), plant growth promoting Rhizo Bacteria and nitrogen fixing bacteria to be utilized.
69. Soil and moisture conservation and water harvesting structures to be used where ever possible for early amelioration and restoration of site.
70. Top soil is most important for successful rehabilitation of mined sites. Topsoil contains majority of seeds and plant propagation, soil microorganism, Organic matter and plant nutrients. Wherever possible the topsoil should be immediately used in the area of the for land form reconstruction, to pre mining conditions.
71. Over burdens may be analyzed and tested for soil characteristics and used in the site for revegetation. Wherever possible seeds, rhizome, bulbs, etc of pioneering spices should be collected, preserved and used in restoring the site.
72. Native grasses seeds may be used as colonizers and soil binders, to prevent erosion and allow diverse self- sustaining plant communities to establish. Grasses may offer superior tolerance to drought, and climatic stresses.
73. Reclamation involves planned topographical reconstruction of site. Care to be taken to minimize erosion and runoff. Topsoils should have necessary physical, chemicals, ecological, properties and therefore should be stored with precautions and utilized for reclamation process. Stocked topsoil should be stabilized using grasses to protect from wind. Seeds of various indigenous and local species may be broad casted after topsoil and treated overburden are spread.
74. Alkaline soils, acidic soils, Saline soils should be suitably treated/amended using green manure, mulches, farmyard manure to increase organic carbon. The efforts should be taken to landscape and use the land post mining. The EMP and mine closure plan should provide adequate budget for re-establishing the site to pre-mining conditions. Effective steps should be taken for utilization of over burden. Mine waste to be used for backfilling, reclamation, restoration, and rehabilitation of the terrain without affecting the drainage and water regimes. The rate of rehabilitation should be similar to rate of mining. The land disturbed should be reshaped for long term use. Mining should be as far as possible be eco-friendly. Integration of rehabilitation strategies with mining plan will enable speedy restoration.

  
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75. Efforts should be taken to aesthetically improve the mine site. Generally, there are two approaches to restoration i.e Ecological approach which allows tolerant species to establish following the succession process allowing pioneer species to establish. The other approach i.e plantation approach is with selected native species are planted. A blend of both methods may be used to restore the site by adding soil humus and mycorrhiza.
76. Action taken for restoration of the site should be specifically mentioned in the EC compliances.


**CONDITIONS IMPOSED BY SEAC:**

1. The prior Environmental Clearance granted for this mining project shall be valid for the project life including production value as laid down in the mining plan approved and renewed by competent authority, from time to time, subject to a maximum of thirty years, whichever is earlier, vide MoEF&CC Notification S.O, 1807(E) dated 12.04.2022.
2. The PP shall inform send the 'Notice of Opening' of the quarry to the Director of Mines Safety, Chennai Region before obtaining the CTO from the TNPCB.
3. The Project Proponent shall abide by the annual production scheduled specified in the approved mining plan and if any deviation is observed, it will render the Project Proponent liable for legal action in accordance with Environment and Mining Laws.
4. The proponent shall appoint the statutory competent persons relevant to the proposed quarry size as per the provisions of Mines Act 1952 and Metalliferous Mines Regulations, 1961, as amended from time to time.
5. Within a period one month from the execution of lease deed, the PP shall ensure that the persons deployed in the quarry shall undergo initial/periodical training in the DGMS approved GVTC situated in Salem (or) Trichy.
6. The PP shall construct a garland drain of size, gradient and length around the proposed quarry incorporating garland canal, silt traps, siltation pond and outflow channel connecting to a natural drain should be provided prior to the commencement of mining. Garland drain, silt-traps, siltation ponds and outflow channel should be de-silted periodically and geo-tagged photographs of the process should be included in the HYCR.

  
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7. Monitoring of drainage water should be carried out at different seasons by an NABL accredited lab and clear water should only be discharged into the natural stream. Geo-tagged photographs of the drainage and sampling site should be submitted along with HYCR.
8. The proponent shall erect fencing all around the boundary of the proposed area with gates for entry/exit before the commencement of the operation and shall furnish the photographs/map showing the same before obtaining the CTO from TNPCB.
9. The PP shall meticulously carry out the mitigation measures as spelt out in the approved EMP.
10. Proper barriers to reduce noise level and dust pollution should be established by providing greenbelt along the boundary of the quarrying site and suitable working methodology should be adopted by considering the wind direction.
11. The Project Proponent shall ensure that the funds earmarked for environmental protection measures are kept in a separate bank account and should not be diverted for other purposes. Year-wise expenditure should be included in the HYCR.
12. The Project Proponent shall send a copy of the EC to the concerned Panchayat/local body.
13. Perennial maintenance of haulage road/village / Panchayat Road shall be done by the project proponent as required, in coordination with the concerned Govt. Authority.
14. Perennial sprinkling arrangements shall be in place on the haulage road for fugitive dust suppression. Fugitive emission measurements should be carried out during the mining operation at regular intervals and submit the consolidated report to TNPCB once in six months.
15. The Proponent shall ensure that the noise level is monitored during mining operation at the project site for all the machineries deployed and adequate noise level reduction measures are undertaken accordingly. The report on the periodic monitoring shall be included in the HYCR.
16. Proper barriers to reduce noise level and dust pollution should be established by providing greenbelt along the boundary of the quarrying site and suitable working methodology to be adopted by considering the wind direction.

  
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17. 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. 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.
18. Taller/one year old saplings raised in appropriate size of bags (preferably eco-friendly bags) should be planted in proper spacing 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.
19. **Noise and Vibration Related:** (i) Appropriate measures should be taken for control of noise levels below 85 dBA in the work environment. Workers engaged in operations of HEMM, etc. should be provided with ear plugs/muffs, (ii) Noise levels should be monitored regularly (on weekly basis) near the major sources of noise generation within the core zone.
20. The PP shall carry out maximum of only one round of controlled blast per day, restricted to the maximum of 30 to 40 number of holes per round with maintaining maximum charge per delay in such a manner that the blast-induced ground vibration level (Peak Particle Velocity) measured in the houses/structures located at a distance of 500 m shall not exceed 2.0 mm/s and no fly rock shall travel beyond 20 m from the site of blasting.
21. **Since few structures are located within 300 m from the lease boundary, within a period of six months from the commencement of quarrying operations,** the PP shall carry out the scientific studies to assess the blast-induced ground vibrations produced from the quarry blasting and to suggest the mitigation measures for the control of ground / air vibrations & fly rock caused due to blasting, by involving anyone of these reputed Research and Academic Institution such as CSIR-Central Institute of Mining & Fuel Research / Dhanbad, NIRM, IIT-Madras, NIT-Dept of Mining Engg, Surathkal and Dept of Mining Engg-Anna University, Chennai. A copy of such scientific study report shall be submitted to

  
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the SEIAA, MoEF, TNPCB, AD/Mines-DGM and DMS, Chennai as a part of Environmental Compliance without any deviation.

22. The PP shall also ensure that the blasting operations are not carried out on a 'day after day' basis and a minimum 24 hours break should be observed between blasting days to reduce the environmental impacts effectively.
23. No 'Deep-hole large diameter drilling and blasting' is permitted unless a special permission is obtained by the PP from DMS-DGMS, Chennai Region.
24. The PP shall ensure that the blasting operations shall be carried out during a prescribed time interval with a prior notice to the habitations situated around the proposed quarry after having posted the sentries/guards adequately to confirm the non-exposure of public within the danger zone of 500 m from the boundary of the quarry. The PP shall use the jack hammer drill machine fitted with the dust extractor for the drilling operations such that the fugitive dust is controlled effectively at the source.
25. The PP shall ensure that the blasting operations are carried out by the blaster/Mine Mate/Mine Foreman employed by him in accordance with the provisions of MMR 1961 and it shall not be carried out by the persons other than the above statutory personnel.
26. The PP shall carry out the scientific studies to assess the slope stability of the proposed quarry working and existing quarry wall before starting the operation of the quarry, since the depth of the quarry already above 30 m, by involving any of the reputed Research and Academic Institution such as CSIR-Central Institute of Mining & Fuel Research / Dhanbad, NIRM, IIT-Madras, NIT-Dept of Mining Engg, Surathkal, and Anna University Chennai-CEG Campus, etc. A copy of such scientific study report shall be submitted to the SEIAA, MoEF, TNPCB, AD/Mines-DGM and DMS, Chennai as a part of Environmental Compliance without any deviation.
27. The PP shall implement the following Special Mitigation Measures in order to protect the Reserve Forest located at a distance of 454 m from the lease boundary:
  - i. Since the R.F is located very close to the proposed quarry site, the PP shall develop Green Belt (Thick Tree plantation in two rows) along the boundary of the mine lease area before obtaining the CTO from the TNPCB.

  
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- ii. The proponent shall construct and maintain proper fencing all around the boundary of the proposed working quarry adjacent to the direction of the location of the Reserved Forest before the commencement of the operation and shall furnish the photographs showing the same before obtaining the CTO from TNPCB.
- iii. The PP shall take steps so that the overburden, waste rock, rejects and fines generated during the mining operations shall be stored in separate dumps positioned in opposite direction to the location of the reserved forest.
- iv. The PP shall ensure that such waste/reject dumps shall be properly secured to prevent escape of material there from in harmful quantities which may cause degradation of environment and to prevent causation of floods.
- v. The PP shall select the site for dumps on impervious ground to ensure minimum leaching effects due to precipitations.
- vi. The PP shall take necessary steps that wherever possible, the waste rock, overburden etc. shall be back-filled into the mine excavations with a view to restoring the land to its original use as far as possible.
- vii. Wherever back-filling of waste rock in the area excavated during mining operations is not feasible, the PP shall take adequate steps in discussion with the concerned DFO to suitably terrace the waste dumps ensuring the stability through vegetation to consolidate the green belt development in the areas adjacent to the reserved forest location.
- viii. The PP shall carry out the scientific investigations in order to keep the ground and noise vibrations caused by blasting operations and movement of HEMM such as Excavators, Trucks within safe limit.
- ix. The PP shall not perform secondary breakage involving the drilling & blasting in the quarrying operations and it can be replaced with non-conventional methods such as noise-controlled rock breakers, usage of non-explosive expansive materials/chemicals, Hydraulic Splitting based on the suitable scientific studies carried out by any reputed scientific and academic institutions.

  
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- x. The PP shall take adequate steps to control the air pollution due to fines, dust, smoke or gaseous emissions during the quarrying operations within 'Permissible Limits' specified under the environmental laws.
  - xi. The Quarrying and Mining activities shall be restricted in the Eco-sensitive Zone of 60 m from the boundary of the Reserved area and hence the PP shall not even indulge in constructing the haul roads in these areas.
  - xii. No development on existing steep hill slopes or slopes with a high degree of erosion shall be permitted. Hence, the PP shall not carry out the quarrying on steep hill slopes with a gradient of 20<sup>0</sup> or more or areas with a high degree of erosion on forestland.
  - xiii. The PP shall give an affidavit at the time of lease execution that there will be no felling of trees (or) any encroachment will not be made on these Reserved Forest lands and also within the Eco- sensitive Zone of 60 m without the prior permission of the State Government in case of reserve forest land as per the procedures laid down by the State Government.
  - xiv. The PP shall not use plastic carry bags within the quarry area.
  - xv. The PP shall ensure that all the haul roads within the quarry lease shall be provided with adequate number of road side drains and these drains shall be kept free from blockage for runoff disposals. This run off from the road side drainage shall relate to the natural drainage system in the area.
28. The PP shall adhere to the provisions of the MoEF had issued Notification No. S.O. 1545 dated 25th June 2009 regulating certain activities in the eco-sensitive zone to conserve and protect the reserved forest area from ecological and environmental point of view.
29. The proponent shall undertake in a phased manner restoration, reclamation and rehabilitation of lands affected by the quarrying operations and shall complete this work before the conclusion of such operations as per the Environmental Management Plan & the approved Mine Closure Plan.
30. Ground water quality monitoring should be conducted once in every six months and the report should be submitted to TNPCB.
31. The operation of the quarry should not affect the agricultural activities & water bodies near the project site and a 50 m safety distance from water body should be

  
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maintained without carrying any activity. The proponent shall take appropriate measures for "Silt Management" and prepare a SOP for periodical de-siltation indicating the possible silt content and size in case of any agricultural land exists around the quarry.

32. The proponent shall provide sedimentation tank / settling tank with adequate capacity for runoff management.
33. The proponent shall ensure that the transportation of the quarried granite stones shall not cause any hindrance to the Village people/Existing Village Road and shall take adequate safety precautionary measures while the vehicles are passing through the schools / hospital. The Project Proponent shall ensure that the road may not be damaged due to transportation of the quarried granite stones; and transport of granite stones will be as per IRC Guidelines with respect to complying with traffic congestion and density.
34. To ensure safety measures along the boundary of the quarry site, security guards are to be posted during the entire period of the mining operation.
35. The Project Proponent shall comply with the provisions of the Mines Act, 1952, MMR 1961 and Mines Rules 1955 for ensuring safety, health and welfare of the people working in the mines and the surrounding habitants.
36. The project proponent shall ensure that the provisions of the MMDR Act, 1957 & the MCDR 2017 and Tamilnadu Minor Mineral Concession Rules 1959 are complied by carrying out the quarrying operations in a skillful, scientific and systematic manner keeping in view proper safety of the labour, structure and the public and public works located in that vicinity of the quarrying area and in a manner to preserve the environment and ecology of the area.
37. The quarrying activity shall be stopped if the entire quantity indicated in the Mining plan is quarried even before the expiry of the quarry lease period and the same shall be informed to the District AD/DD (Geology and Mining) District Environmental Engineer (TNPCB) and the Director of Mines Safety (DMS), Chennai Region by the proponent without fail.

  
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38. The Project Proponent shall abide by the annual production scheduled specified in the approved mining plan and if any deviation is observed, it will render the Project Proponent liable for legal action in accordance with Environment and Mining Laws.
39. All the conditions imposed by the Assistant/Deputy Director, Geology & Mining, concerned District in the mining plan approval letter and the Precise area communication letter issued by concerned District Collector should be strictly followed.
40. That the grant of this E.C. is issued from the environmental angle only, and does not absolve the project proponent from the other statutory obligations prescribed under any other law or any other instrument in force. The sole and complete responsibility, to comply with the conditions laid down in all other laws for the time-being in force, rests with the project proponent.
41. As per the directions contained in the OM F.No.22-34/2018-IA.III dated 16th January 2020 issued by MoEFCC, the Project Proponent shall, undertake re-grassing the mining area and any other area which may have been disturbed due to his mining activities and restore the land to a condition which is fit for growth of fodder, flora, fauna etc. The compliance of this direction shall be included in the Half Yearly Compliance Report which will be monitored by SEAC at regular intervals.
42. The mining lease holders shall, after ceasing mining operations, undertake re-grassing the mining area and any other area which may have been disturbed due to their mining activities and restore the land to a condition which is fit for growth of fodder, flora, fauna etc.
43. 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 adhere to the EMP as committed.
44. As accepted by the Project Proponent the CER cost of Rs. **5 lakhs** and the amount shall be spent for the Panchayat Union Primary School, Panayampalli, Erode District within a period of six months before the execution of lease.

  
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Appendix -I

List of Native Trees Suggested for Planting

1. *Aeglemarmelos*–Vilvam
2. *Adenaantherapavonina*-Manjadi
3. *Albizialebbeck*–Vaagai
4. *Albiziaamara*-Usil
5. *Bauhinia purpurea* - Mantharai
6. *Bauhinia racemosa* - Aathi
7. *Bauhinia tomentosa*–Iruvathi
8. *Buchananiaaillaris*-Kattuma
9. *Borassusflabellifer*- Panai
10. *Buteamonosperma* - Murukkamaram
11. *Bobaxceiba*– Ilavu, Sevvilavu
12. *Calophylluminophyllum* - Punnai
13. *Cassia fistula*- Sarakondrai
14. *Cassia roxburghii*- Sengondrai
15. *Chloroxylonsweitenia* - Purasamaram
16. *Cochlospermumreligiosum*– Kongu, Manjalllavu
17. *Cordiadichotoma*– Mookuchalimaram
18. *Cretevaadansonii*–Mavalingum
19. *Dilleniaindica*– Uva, Uzha
20. *Dilleniapentagyna*– SiruUva, Sitruzha
21. *Diospyrosebenum*- Karungali
22. *Diospyroschloroxylon*– Vaganai
23. *Ficusamplissima*– Kalltchi
24. *Hibiscus tiliaceous*–Aatrupoovarasu
25. *Hardwickiabinata*– Aacha
26. *Holopteliaintegrifolia*-Aayili
27. *Lanneacoromandelica* - Odhiam
28. *Lagerstroemia speciosa* - Poo Marudhu
29. *Lepisanthustetraphylla*- Neikottaimaram
30. *Limoniaacidissima* - Vila maram

  
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31. *Litsea glutinosa*–Pisinpattai
32. *Madhuca longifolia* - Illuppai
33. *Manilkara hexandra*–UlakkaiPaalai
34. *Mimusops elengi* - Magizhamaram
35. *Mitragyna parvifolia* - Kadambu
36. *Morinda pubescens*–Nuna
37. *Morinda citrifolia*– VellaiNuna
38. *Phoenix sylvestre*-Eachai
39. *Pongamia pinnata*–Pungam
40. *Premna mollissima*– Munnai
41. *Premna serratifolia*– Narumunnai
42. *Premna tomentosa*-PurangaiNaari, PudangaNaari
43. *Prosopis cinerea* - Vannimaram
44. *Pterocarpus marsupium* - Vengai
45. *Pterospermum canescens*–Vennangu, Tada
46. *Pterospermum xylocarpum* - Polavu
47. *Puthranjiva roxburghii*–Puthranjivi
48. *Salvadora persica*– Ugaamaram
49. *Sapindus marginatus*- Manipungan, Soapukai
50. *Saraca asoca* - Asoca
51. *Strobilusa peruviana*- Pirayamaram
52. *Strychnos nuxvomica*–Yetti
53. *Strychnos potatorum* - Therthang Kottai
54. *Syzygium cumini* - Naval
55. *Terminalia bellerica*- Thandri
56. *Terminalia arjuna*- Venmarudhu
57. *Toona ciliata* – Sandhanavembu
58. *Thespesia populnea*- Puvarasu
59. *Walsura trifoliata*–valsura
60. *Wrightia tinctoria*- Veppalai
61. *Pithecellobium dulce* – Kodukkapuli

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5. A copy of the Environment Clearance letter shall be sent by the proponent to the concerned Panchayat, Town Panchayat / Panchayat union / Municipal Corporation, Urban Local Body and the Local NGO, if any, from whom suggestions / representations, if any, were received while processing the proposal. The clearance letter shall also be put on the website of the proponent and also kept at the site, for the general public to see.
6. Quarry lease area should be demarcated on the ground with wire fencing to show the boundary of the lease area on all sides with red flags on every pillar shall be erected before commencement of quarrying.
7. The proponent shall ensure that First Aid Box is available at site.
8. The excavation activity shall not alter the natural drainage pattern of the area.
9. The excavated pit shall be restored by the project proponent for useful purposes.
10. The proponent shall quarry and remove only in the permitted areas as per the approved Mining Plan details.
11. The quarrying operation shall be restricted between 7AM and 5 PM.
12. The proponent shall take necessary measures to ensure that there shall not be any adverse impacts due to quarrying operation on the nearby human habitations, by way of pollution to the environment.
13. A minimum distance of 50mts. from any civil structure shall be kept from the periphery of any excavation area.
14. Depth of quarrying should be as per approved mining plan.
15. The mined out pits should be backfilled where warranted and area should be suitably landscaped to prevent environmental degradation. The mine closure plan as furnished in the proposal shall be strictly followed with back filling and tree plantation.
16. Wet drilling method is to be adopted to control dust emissions. Delay detonators and shock tube initiation system for blasting shall be used so as to reduce vibration and dust.
17. Drilling and blasting shall be done only either by licensed explosive agent or by the proponent after obtaining required approvals from Competent Authorities.
18. Blasting shall be carried out after announcing to the public adequate through public address system to avoid any accident.

  
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19. A study has to be conducted to assess the optimum blast parameters and blast design to keep the vibration limits less than prescribed levels and only such design and parameters should be implemented while blasting is done. Periodical monitoring of the vibration at specified location to be conducted and records kept for inspection.
20. The Proponent shall take appropriate measures to ensure that the GLC shall comply with the revised NAAQ norms notified by MoEF& CC, GoI on 16.11.2009.
21. The following measures are to be implemented to reduce Air Pollution during transportation of mineral
  - i. Roads shall be graded to mitigate the dust emission.
  - ii. Water shall be sprinkled at regular interval on the main road and other service roads to suppress dust
22. The following measures are to be implemented to reduce Noise Pollution
  - i. Proper and regular maintenance of vehicles and other equipment
  - ii. Limiting time exposure of workers to excessive noise.
  - iii. The workers employed shall be provided with protection equipment and earmuffs etc.
  - iv. Speed of trucks entering or leaving the mine is to be limited to moderate speed of 25 kmph to prevent undue noise from empty trucks.
  - v. All noise generating machinery the compressor, generator to be enclosed in acoustic enclosure so as to reduce noise in working area.
23. Measures should be taken to comply with the provisions laid under Noise Pollution (Regulation and Control) (Amendment) Rules, 2010, dt: 11.01.2010 issued by the MoEF& CC, GoI to control noise to the prescribed levels.
24. Suitable conservation measures to augment groundwater resources in the area shall be planned and implemented in consultation with Regional Director, CGWB. Suitable measures should be taken for rainwater harvesting.
25. Permission from the competent authority should be obtained for drawl of ground water, if any, required for this project.
26. Topsoil, if any, shall be stacked properly with proper slope with adequate measures and should be used for plantation purpose.
27. The following measures are to be adopted to control erosion of dumps: -
  - i. Retention / toe walls shall be provided at the foot of the dumps.

  
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- ii. Worked out slopes are to be stabilized by planting appropriate shrub / grass species on the slopes.
28. Waste oils, used oils generated from the EM machines, mining operations, if any, shall be disposed as per the Hazardous & other wastes (Management, and Trans Boundary Movement) Rules, 2016 and its amendments thereof to the recyclers authorized by TNPCB.
29. Concealing the factual data or failure to comply with any of the conditions mentioned above may result in withdrawal of this clearance and attract action under the provisions of Environment (Protection) Act, 1986.
30. Rain water harvesting to collect and utilize the entire water falling in land area should be provided.
31. Rain water getting accumulated in the quarry floor shall not be discharged directly to the nearby stream or water body. If it is to be let into the nearby water body, it has to be discharged into a silt trap on the surface within the lease area and only the overflow after allowing settling of soil be let into the nearby waterways. The silt trap should be of sufficient dimensions to catch all the silt water being pumped out during one season. The silt trap should be cleaned of all the deposited silt at the end of the season and kept ready for taking care of the silt in the next season.
32. The lease holder shall undertake adequate safeguard measures during extraction of material and ensure that due to this activity, the hydro-geological regime of the surrounding area shall not be affected. Regular monitoring of ground water level and quality shall be carried out around the mine lease area during the mining operation. If at any stage, if it is observed that the groundwater table is getting depleted due to the mining activity; necessary corrective measures shall be carried out. District Collector / mining officer shall ensure this.
33. No tree-felling shall be done in the leased area, except only with the permission from competent Authority.
34. To take up environmental monitoring of the proposed quarry site before, during and after the mining activities including vibration study data, water, air & flora/fauna environment, slurry water generated/disposed and method of disposal, involving a reputed academic Institution.

  
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35. It shall be ensured that the total extent of nearby quarries (existing, abandoned and proposed) located within 500-meter radius from the periphery of this quarry is not exceeding 5 hectares within the mining lease period of this application.
36. It shall be ensured that there is no habitation is located within 300-meter radius from the periphery of the quarry site and also ensure that no hindrance will be caused to the people of the habitation located within 300m radius from the periphery of the quarry site.
37. Free Silica test should be conducted and reported to TNPCB, Department of Geology and Mining and Regional Director, MoEF & CC, GOI.
38. Air sampling at intersection point should be conducted and reported to TNPCB, Department of Geology and Mining and Regional Director, MoEF & CC, GOI.
39. Bunds to be provided at the boundary of the project site.
40. The project proponent shall undertake plantation / afforestation work by planting the native species on all side of the lease area at the rate of 400/Ha. Suitable tall tree saplings should be planted on the bunds and other suitable areas in and around the work place.
41. Floor of excavated pit to be levelled and sides to be sloped with gentle slope (Except for granite quarries) in the mine closure phase.
42. The Project Proponent shall ensure a minimum of 2.5% of the annual turnover will be utilized for the CSR Activity
43. The Project Proponent shall provide solar lighting system to the nearby villages.
44. Earthen bunds and barbed wire fencing around the pits with green belt all along the boundary shall be developed and maintained.
45. Safety equipments to be provided to all the employees.
46. Safety distance of 50m has to be provided in case of railway, reservoir, canal / odai
47. The Assistant/Deputy Director, Department of Geology & mining shall ensure that the proponent has engaged the blaster with valid Blasting license/certificate obtained from the competent authority before execution of mining lease.
48. The proponent shall furnish the Baseline data covering the Air, Water, Noise and land environment quality for the proposed quarry site before execution of mining lease.

  
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49. The proponent shall erect the pillars in accordance with the Rules for depicting GPS details in the earmarked boundary of the quarry site to monitor electronically before execution of mining.
50. The proponent has to provide insurance protection to the workers in the case of existing mining or provide the affidavit in case of fresh lease before execution of mining lease.
51. The proponent has to display the name board at the quarry site showing the details of Proponent, lease period, extent, etc., with respect to the existing activity before execution of mining.
52. Heavy earth machinery equipments if utilized, after getting approval from the competent authority.
53. The Proponent shall ensure that the project activity including blasting, mining transportation etc should in no way have adverse impact to the other forests, such as reserve forests and social forests, tree plantation and bio diversity, surrounding water bodies etc.
54. The proponent shall provide Green Belt development at the rate of not less than 400 trees/Hectare. The tree saplings shall be not less than 3m height.
55. The fugitive emissions should be monitored during the mining activity and should be reported to TNPCB once in a month and the operation of the quarry should no way impact the agriculture activity & water bodies near the project site.
56. All the commitment made by the project proponent in the proposal shall be strictly followed.
57. The mining lease holders shall, after ceasing mining operations, undertake re-grassing the mining area and any other area which may have been disturbed due to their mining activities and restore the land to a condition which is fit for growth of fodder, flora, fauna etc.

**Part B: General Conditions:**

1. EC is given only on the factual records, documents and the commitment furnished in non judicial stamp paper by the proponent.
2. The Proponent shall obtain the Consent from the TNPC Board before commencing the activity.

  
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3. No change in mining technology and scope of working should be made without prior approval of the SEIAA, Tamil Nadu.
4. No change in the calendar plan including excavation, quantum of mineral (minor mineral) should be made.
5. Effective safeguard measures, such as regular water sprinkling shall be carried out in critical areas prone to air pollution and having high levels of particulate matter such as loading and unloading point and all transfer points. Extensive water sprinkling shall be carried out on haul roads. It should be ensured that the Ambient Air Quality parameters conform to the norms prescribed by the Central Pollution Control Board in this regard.
6. Effective safeguards shall be adopted against health risks on account of breeding of vectors in the water bodies created due to excavation of earth.
7. A berm shall be left from the boundary of adjoining field having a width equal to at least half the depth of proposed excavation.
8. Loading and unloading areas including all the transfer points should also have efficient dust control arrangements. These should be properly maintained and operated.
9. Vehicular emissions shall be kept under control and be regularly monitored. The mineral transportation shall be carried out through the covered trucks only and the vehicles carrying the mineral shall not be overloaded.
10. Access and haul roads to the quarrying area should be restored in a mutually agreeable manner where these are considered unnecessary after extraction has been completed.
11. All Personnel shall be provided with protective respiratory devices including safety shoes, masks, gloves etc. Supervisory people should be provided with adequate training and information on safety and health aspects. Occupational health surveillance program of the workers should be undertaken periodically to observe any contractions due to exposure to dust and take corrective measures, if needed.
12. Periodical medical examination of the workers engaged in the project shall be carried out and records maintained. For the purpose, schedule of health examination of the workers should be drawn and followed accordingly. The workers shall be provided with personnel protective measures such as masks, gloves, boots etc.

  
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13. Workers / labourers shall be provided with facilities for drinking water and sanitation facility for Female and Male separately.
14. The project proponent shall ensure that child labour is not employed in the project as per the sworn affidavit furnished.
15. The funds earmarked for environmental protection measures should be kept in separate account and should not be diverted for other purpose. Year wise expenditure should be reported to the Ministry of Environment and Forests and its Regional Office located at Chennai.
16. The Environmental Clearance does not absolve the applicant/proponent of his obligation/requirement to obtain other statutory and administrative clearances from other statutory and administrative authorities.
17. This Environmental Clearance does not imply that the other statutory / administrative clearances shall be granted to the project by the concerned authorities. Such authorities would be considering the project on merits and be taking decisions independently of the Environmental Clearance
18. The SEIAA, Tamil Nadu may alter / modify the above conditions or stipulate any further conditions in the interest of environment protection.
19. The SEIAA, Tamil Nadu may cancel the Environmental Clearance granted to this project under the provisions of EIA Notification, 2006, at any stage of the validity of this Environmental Clearance, if it is found or if it comes to the knowledge of this SEIAA, TN that the project proponent has deliberately concealed and/or submitted false or misleading information or inadequate data for obtaining the Environmental Clearance.
20. Failure to comply with any of the conditions mentioned above may result in withdrawal of this clearance and attract action under the provisions of the Environment (Protection) Act, 1986.
21. The above conditions will be enforced inter-alia, under the provisions of the Water (Prevention & Control of Pollution) Act, 1974, the Air (Prevention & Control of Pollution) Act, 1981, the Environment (Protection) Act, 1986, the Public Liability Insurance Act, 1991, along with their amendments, Minor Mineral Conservation & Development Rules, 2010 framed under MMDR Act 1957, National Commission for protection of Child Right Rules, 2006, Wildlife Protection Act, 1972, Forest

  
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Conservation Act, 1980, Biodiversity Conservation Act, 2016, the Biological Diversity Act, 2002 and Biological diversity Rules, 2004 and Rules made there under and also any other orders passed by the Hon'ble Supreme Court of India / Hon'ble High Court of Madras and any other Courts of Law relating to the subject matter.

22. Any other conditions stipulated by other Statutory / Government authorities shall be complied.
23. Any appeal against this Environmental Clearance shall lie with the Hon'ble National Green Tribunal, if preferred, within a period of 30 days as prescribed under Section 16 of the National Green Tribunal Act, 2010.
24. The Environmental Clearance is issued based on the documents furnished by the project proponent. In case any documents found to be incorrect / not in order at a later date the Environmental Clearance issued to the project will be deemed to be revoked / cancelled.

  
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**Copy to:**

1. The Secretary, Ministry of Mines, Government of India, Shastri Bhawan, New Delhi.
2. The Additional Chief Secretary to Government, Environment, Climate Change and Forests Department, Tamil Nadu.
3. The Additional Chief Secretary to Government, Industries, Investment Promotion & Commerce Department, Tamil Nadu.
4. The Additional Principal Chief Conservator of Forests, Regional Office (SZ), 34, HEPC Building, 1<sup>st</sup> & 2<sup>nd</sup> 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 Chairman, TNPC Board, 76, Mount Salai, Guindy, Chennai - 32.
7. The District Collector, Erode District.
8. The Commissioner of Geology and Mines, Guindy, Chennai - 32.
9. Deputy Director, Department of Geology & Mining, Erode District.
10. EI Division, Ministry of Environment & Forests, Paryavaran Bhawan, New Delhi.
11. File Copy.

**Signature Not Verified**

Digitally signed by: Thiru. Deepak S. Bilgi  
Designation: Member Secretary  
Date and Time: 27/12/2023 3:30:53 PM



TMT. P. RAJESWARI, I.F.S.,  
MEMBER SECRETARY

STATE LEVEL ENVIRONMENT IMPACT  
ASSESSMENT AUTHORITY – TAMIL NADU

3<sup>rd</sup> Floor, Panagal Maaligai,  
No.1, Jeenis Road, Saidapet,  
Chennai-15.

Phone No. 044-24359973

Fax No. 044-24359975

**ENVIRONMENTAL CLEARANCE**

**Lr. No.SEIAA-TN/F.No.8357/1(a)/EC.No:4807/2021 dated:18.10.2021**

To

Thiru.N.T.Saisada  
S/o.Thyagaraj  
No.12,Gandhiji 3rd Street  
Karur Bypass Road  
Erode District-638002

Sir/Madam,

**Sub:** SEIAA-TN – Proposed Rough Stone & Gravel quarry lease area over an extent of 1.64.5Ha at S.F.Nos. 152/2 & 152/3 Kurumbapalayam Village, Sathiyamangalam Taluk, Erode District , Tamil Nadu by Thiru.N.T.Saisada - issue of Environmental Clearance– Reg.

**Ref:** 1. Online Proposal No. SIA/TN/MIN/198529/2020, Dated: 16.02.2021.  
2. Application for Environmental Clearance dated: 17.02.2021.  
3. Minutes of the 227<sup>th</sup> meeting of SEAC held on 21.08.2021  
4. Minutes of the 465<sup>th</sup> Authority meeting held on 01.10.2021

**Details of Minor Mineral Activity:-**

This has reference to your application second cited. The proposal is for obtaining Environmental Clearance for mining/quarrying of minor minerals based on the particulars furnished in your application as shown below.

|   |  |                                    |
|---|--|------------------------------------|
| 1 | <b>Name of Project Proponent and address</b> | Thiru.N.T.Saisada<br>S/o.Thyagaraj |
|---|--|------------------------------------|



*Rajeswari P*  
MEMBER SECRETARY  
SEIAA-TN

|          |  |  |
|----------|--|--|
|          |  | No.12,Gandhiji 3rd Street<br>Karur Bypass Road<br>Erode District-638002            |
| <b>2</b> | <b>Location of the Proposed Activity</b>   |  |
|          | Survey Number  | 152/2 & 152/3  |
|          | Latitude and Longitude   | 11°25'52.86" N to 11°25'55.86"N<br>77°10'11.98"E to 77°10'19.13"E                  |
|          | Village  | Kurumbapalayam   |
|          | Taluk  | Sathiyamangalam  |
|          | District   | Erode  |
| <b>3</b> | <b>Proposed Activity</b>   |  |
|          | i. Minor mineral   | Rough Stone and Gravel   |
|          | ii. Mining Lease Area  | 1.64.5Ha   |
|          | iii. Approved quantity   | 112720 cu.m of Rough stone, 19344 cu.m<br>of weathered rock & 35685 cu.m of Gravel |
|          | iv. Depth of Mining  | 25m  |
|          | v. Type of mining  | Opencast Mechanized Mining Method  |
|          | vi. Category(B1/B2)  | B2   |
|          | vii. Precise area communication approved by<br>the Assistant Director, with date   | Na.Ka.No.22023/2017/x-1, Dated:<br>06.01.2021                                      |
|          | viii. Mining plan approval by Deputy Director<br>Department of Geology and Mining, with<br>date                          | Re.No.22023/2017/x-1, Dated: 01.02.2021  |
|          | ix. Mining period  | 5 year   |
| <b>4</b> | <b>Whether Project area attracts any General<br/>conditions specified in the EIA notification,<br/>2006 as amended:-</b> | Not attracted. Affidavit furnished.  |
| <b>5</b> | <b>Man Power requirement per day:</b>  | 21 Employees   |
| <b>6</b> | <b>Utilities</b>   |  |



*Bejema*  
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|   |  |  |
|---|--|--|
|   | i. Source of Water :   | Water Vendors & Existing Bore well           |
|   | ii. Quantity of Water Requirement in KLD:  | 3.0 KLD                                      |
|   | a. Domestic & Drinking purpose   | 0.7KLD                                       |
|   | b. Green Belt & Dust Suppression   | 1.5KLD<br>0.8 KLD                            |
|   | iii. Power Requirement:  |  |
|   | a. Domestic Purpose  | TNEB   |
|   | b. Industrial Purpose  | 103890 Liters of HSD for entire life of mine |
| 7 | <b>Cost</b>  |  |
|   | i. Project Cost  | Rs. 35.88 Lakhs                              |
|   | ii. EMP Cost   | Rs. 3.80 Lakhs                               |
|   | iii. CER Cost  | Rs. 0.80 Lakhs                               |
| 8 | <b>Validity:</b>   |  |
|   | This Environmental Clearance is granted for the production of 112720 cu.m of Rough stone, 19344 cu.m of weathered rock & 35685 cu.m of Gravel for period of five years from the date of execution of the mining lease. |  |

**Affidavit**

The Proponent has furnished affidavit in One Hundred Rupees stamp paper attested by the Notary stating that

I, Thiru.N.T.Saisada, S/o.Thyagaraj, No.12,Gandhiji 3rd Street, Karur Bypass Road, Erode District-638002, solemnly declare and sincerely affirm that:

I have applied for getting Environmental Clearance to SEIAA, Tamil Nadu for mining lease for the Proposed Rough Stone & Gravel quarry lease area over an extent of 1.64.5Ha at S.F.Nos. 152/2 & 152/3 Kurumbapalayam Village, Sathiyamangalam Taluk, Erode District , Tamil Nadu.

1. I swear to state and confirm that within 10km area of the mine site, I have applied for Environmental Clearance, none of the following is situated.
  - a. Protected areas notified under the Wild Life (Protection) Act, 1972.
  - b. Critically polluted areas as notified by the central pollution control board constituted under water (Prevention and control of pollution) Act, 1974.
  - c. Eco – sensitive areas as notified



*Rajendra P*  
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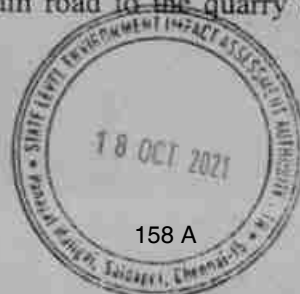
- d. Interstate boundaries and international boundaries within 10km radius from the boundary of the proposed side.
2. I will complete the following corporate environment responsibility (CER) activities before commencement of the quarrying activities.

| CER Activity   | Project Cost (Rs.Lakhs) | CER Cost 2.0% of project cost (Rs.Lakhs) |
|--|-------------------------|--|
| The applicant indents to involve CER responsibility activity like Water Purifier, cot and Bed facility and medicine storage rack to the Dispensary and Water purifier and Table facilities to the Govt school at 2.0% of the total project cost. | 39.68                   | 0.80                                     |
| <b>Total cost Allocation</b>   | <b>39.68</b>            | <b>0.80</b>                              |

3. The following quarries are located within the radius of 500m from the periphery of my quarry.

| S.No  | Name and Address of the applicant   | S.F. No , Village & Taluk  | Extent (in Hects) | Remarks |
|---|---|--|-------------------|---------|
| <b>Details of Existing Quarry:</b>          |   |  |                   |         |
| Nil   |   |  |                   |         |
| <b>Details of Expired/Abandoned Quarry:</b> |   |  |                   |         |
| Nil   |   |  |                   |         |
| <b>Details of Proposed Quarry:</b>          |   |  |                   |         |
| 1.  | Thiru.N.T.Saisada<br>S/o.Thyagaraj<br>No.12,Gandhiji 3rd Street<br>Karur Bypass Road<br>Erode District-638002 | 152/2 & 152/3<br>Kurumbapalayam Village,<br>Sathiyamangalam Taluk,<br>Erode District | 1.64.5Ha          | -       |

4. There will not be hindrance or disturbance to the people living during quarrying and transportation.
5. There is No approved habitation within 500m radius from the periphery of my quarry.
6. I swear that afforestation will be carried out during the course of quarrying operation and maintained.
7. The required insurance will be taken in the name of the labourers working in my quarry site.
8. The existing road from the main road to the quarry is in good condition and the same will be



*Rajendra P*  
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maintained and utilized for transportation of Rough Stone.

9. I will not engage any child labour in my quarry site and I aware that engaging child labour is punishable under the law.
10. All types of safety / protective equipments will be provided to all the labourers working in my quarry.
11. No permanent structures, temples, etc., are located within 300m radius from the periphery of my quarry.

I ensure to do all the social and Environment commitment as mentioned in the Mining Plan to the best of my knowledge.

**Details of Quarries located within 500M radius from the proposed quarry:**

The Project Proponent has submitted a copy of the letter obtained from the Joint Director/Assistant Director (i/c), Department of Geology & Mining, Erode District in his Rc.No.22023/2017/x-1, Dated: 01.02.2021 has stated that the details of other quarries within a radius 500m from the boundary of the proposed quarry site as follows:

| S.No  | Name and Address of the applicant   | S.F. No , Village & Taluk  | Extent (in Hects) | Remarks |
|---|---|--|-------------------|---------|
| <b>Details of Existing Quarry:</b>          |   |  |                   |         |
| Nil   |   |  |                   |         |
| <b>Details of Expired/Abandoned Quarry:</b> |   |  |                   |         |
| Nil   |   |  |                   |         |
| <b>Details of Proposed Quarry:</b>          |   |  |                   |         |
| 2.  | Thiru.N.T.Saisada<br>S/o.Thyagaraj<br>No.12,Gandhiji 3rd Street<br>Karur Bypass Road<br>Erode District-638002 | 152/2 & 152/3<br>Kurumbapalayam Village,<br>Sathiyamangalam Taluk,<br>Erode District | 1.64.5Ha          | -       |

**Appraisal by SEAC:**

The proposal was placed in the 227<sup>th</sup> meeting of SEAC held on 21.08.2021. Based on the presentation made and the documents furnished by the Project proponent, SEAC decided to recommend the project proposal to SEIAA for grant of Environmental Clearance subject to the following specific conditions, in addition to normal conditions:

1. Restricting the maximum depth of mining upto 25m for Rough Stone, Weathered Rock &



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- Gravel considering the environmental impacts due to the mining, safety of the working personnel and following the principle of the sustainable mining are permitted for mining over five years.
2. The proponent shall form proper benches as per the approved mining plan during the operation of the quarry considering the hydro-geological regime of the surrounding area as well as for safe mining.
  3. The Proponent should install cautionary board at the entry and important locations of the mining site displaying caution notice to the public about the danger of entering the mining lease.
  4. The proponent shall conduct annual physical fitness test and eye test for all the employees to ensure health & safety during occupation.
  5. Fugitive emission measurements should be carried out during the mining operation and the report on the same may be submitted to SEIAA once in six months.
  6. The Proponent shall ensure that the Noise level is monitored during mining operation at the project site and adequate noise level reduction measures be undertaken.
  7. The proponent shall erect fencing all around the boundary of the proposed area with gates for entry/exit as per the conditions and shall furnish the photographs/map showing the same before obtaining the CTO from TNPCB.
  8. Greenbelt needs to be developed in the periphery of the mines area preferably adopting Miyawaki scheme of atleast 3m width so that at the closure time the trees would have grown well.
  9. Groundwater quality monitoring should be conducted once every six months and the report should be submitted to TNPCB.
  10. After mining is completed, proper leveling should be done by the Project proponent & Environmental Management Plan furnished by the Proponent should be strictly followed.
  11. The Project proponent shall strictly adhere to mine closure plan after ceasing mining operations as committed. Also the proponent shall undertake re-grassing of the mining area and any other area which have been disturbed due to their mining activities and restore the land to a condition that is fit for the growth of fodder, flora, fauna etc.
  12. Proper barrier to reduce noise level, dust pollution and to hold down any possible fly material (debris) should be established by providing greenbelt and/or metal sheets along the boundary of the quarrying site and suitable working methodology to be adopted by considering the wind



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direction.

13. The operation of the quarry should not affect the agriculture activities & water bodies near the project site and a safety distance of 50m from the water body should be left vacant without any mining activity.
14. Transportation of the quarried materials shall not cause any hindrance to the Village people or damage to the existing Village road.
15. The Project Proponent shall comply with the mining and other relevant rules and regulations wherever applicable.
16. The proponent shall develop an adequate greenbelt with native species on the periphery of the mine lease area before the commencement of the mining activity, in consultation with DFO of the concerned district/agriculture.
17. The quarrying activity shall be stopped if the entire quantity indicated in the Mining plan is quarried even before the expiry of the quarry lease period and the same shall be monitored by the District Authorities.
18. Prior clearance from Forestry & Wild Life including clearance from committee of the National Board for Wildlife as applicable shall be obtained before starting the quarrying operation, if the project site attracts the NBWL clearance.
19. To ensure safety measures along the boundary of the quarry site, security guards are to be posted during the entire period of the mining operation.
20. As per the MoEF & CC Office Memorandum F.No. 22-65/2017-IA.III dated: 30.09.2020 and 20.10.2020 the proponent shall furnish the detailed EMP mentioning all the activities as proposed in the CER and furnish the same before placing the subject to SEIAA.
21. All the conditions imposed by the Deputy Director, Geology & Mining, Erode District in the mining plan approval and the precise area communication issued by District Collector, Erode District should be strictly followed.

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

The subject was placed before the Authority in its 465<sup>th</sup> meeting held on 01.10.2021. After detailed discussions, the Authority accepted the recommendation of SEAC and decided to grant Environmental Clearance to the proposed Project subject to the conditions as recommended by SEAC & normal conditions in addition to the following conditions:



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1. As per the recommendation of SEAC and as accepted by the proponent, the maximum depth of mining is restricted to 25m for the Rough Stone, Weathered Rock & Gravel considering the environmental impacts due to the mining, safety of the working personnel and following the principle of the sustainable mining are permitted for mining over five years.
2. As per the MoEF& CC office memorandum F.No.22-65/2017-IA.III dated: 30.09.2020 and 20.10.2020 the proponent has furnished the detailed EMP mentioning all the activities for Rs. 0.80 lakhs of CER as committed. All the activities proposed shall be carried out before obtaining CTO from TNPCB.

**Part-A: Conditions to be Complied before commencing mining operations:-**

1. The project proponent shall advertise in at least two local newspapers widely circulated in the region, one of which shall be in the vernacular language informing the public that

- |  |
|--|
| <ol style="list-style-type: none"> <li>I. The project has been accorded Environmental Clearance.</li> <li>II. Copies of clearance letters are available with the Tamil Nadu Pollution Control Board.</li> <li>III. Environmental Clearance may also be seen on the website of the SEIAA.</li> <li>IV. The advertisement should be made within 7 days from the date of receipt of the clearance letter and a copy of the same shall be forwarded to the SEIAA.</li> </ol> |
|--|

2. Mining activity should be reviewed by the District Collector after three years and decide for further extension.
3. The mine closure plan submitted by the project proponent shall be strictly followed after the lapse of the mine.
4. NOC from the Standing committee of the NBWL shall be obtained, if protected areas are located within 10 Km from the proposed project site.
5. The project proponent shall comply the conditions laid down in the Section V, Rule 36 of Tamil Nadu Minor Minerals Concession Rules 1959.
6. A copy of the Environment Clearance letter shall be sent by the proponent to the concerned Panchayat, Town Panchayat / Panchayat union/ Municipal Corporation,



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Urban Local Body and the Local NGO, if any, from whom suggestions/ representations, if any, were received while processing the proposal. The clearance letter shall also be put on the website of the proponent and also kept at the site, for the general public to see.


7. Quarry lease area should be demarcated on the ground with wire fencing to show the boundary of the lease area on all sides with red flags on every pillar shall be erected before commencement of quarrying.
8. The proponent shall ensure that First Aid Box is available at site.
9. The excavation activity shall not alter the natural drainage pattern of the area.
10. The excavated pit shall be restored by the project proponent for useful purposes.
11. The proponent shall quarry and remove only in the permitted areas as per the approved Mining Plan details.
12. The quarrying operation shall be restricted between 7AM and 5 PM.
13. The proponent shall take necessary measures to ensure that there shall not be any adverse impacts due to quarrying operation on the nearby human habitations, by way of pollution to the environment.
14. A minimum distance of 50mts. from any civil structure shall be kept from the periphery of any excavation area.
15. The mined out pits should be backfilled where warranted and area should be suitably landscaped to prevent environmental degradation. The mine closure plan as furnished in the proposal shall be strictly followed with back filling and tree plantation.
16. Wet drilling method is to be adopted to control dust emissions. Delay detonators and shock tube initiation system for blasting shall be used so as to reduce vibration and dust.
17. Drilling and blasting shall be done only either by licensed explosive agent or by the proponent after obtaining required approvals from Competent Authorities.
18. Blasting shall be carried out after announcing to the public adequate through public address system to avoid any accident.
19. A study has to be conducted to assess the optimum blast parameters and blast design to keep the vibration limits less than prescribed levels and only such design and parameters should be implemented while blasting is done. Periodical monitoring of the vibration at specified location to be conducted and records kept for inspection.
20. The Proponent shall take appropriate measures to ensure that the GLC shall comply with the revised NAAQ norms notified by MoEF, Govt of India, CC, Gol on 16.11.2009.



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SEIAA-TN

21. The following measures are to be implemented to reduce Air Pollution during transportation of mineral
- Roads shall be graded to mitigate the dust emission.
  - Water shall be sprinkled at regular interval on the main road and other service roads to suppress dust
22. The following measures are to be implemented to reduce Noise Pollution
- Proper and regular maintenance of vehicles and other equipment
  - Limiting time exposure of workers to excessive noise.
  - The workers employed shall be provided with protection equipment and earmuffs etc.
  - Speed of trucks entering or leaving the mine is to be limited to moderate speed of 25 kmph to prevent undue noise from empty trucks.
  - All noise generating machinery the compressor, generator to be enclosed in acoustic enclosure so as to reduce noise in working area.
23. Measures should be taken to comply with the provisions laid under Noise Pollution (Regulation and Control) (Amendment) Rules, 2010, dt: 11.01.2010 issued by the MoEF& CC, GoI to control noise to the prescribed levels.
24. Suitable conservation measures to augment groundwater resources in the area shall be planned and implemented in consultation with Regional Director, CGWB. Suitable measures should be taken for rainwater harvesting.
25. Permission from the competent authority should be obtained for drawl of ground water, if any, required for this project.
26. Topsoil, if any, shall be stacked properly with proper slope with adequate measures and should be used for plantation purpose.
27. The following measures are to be adopted to control erosion of dumps:-
- Retention/ toe walls shall be provided at the foot of the dumps.
  - Worked out slopes are to be stabilized by planting appropriate shrub/ grass species on the slopes.
28. Waste oils, used oils generated from the EM machines, mining operations, if any, shall be disposed as per the Hazardous& other wastes (Management, and Trans Boundary Movement) Rules, 2016 and its amendments thereof to the recyclers authorized by TNPCB.



  
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29. Concealing the factual data or failure to comply with any of the conditions mentioned above may result in withdrawal of this clearance and attract action under the provisions of Environment (Protection) Act, 1986.
30. Rain water harvesting to collect and utilize the entire water falling in land area should be provided.
31. Rain water getting accumulated in the quarry floor shall not be discharged directly to the nearby stream or water body. If it is to be let into the nearby water body, it has to be discharged into a silt trap on the surface within the lease area and only the overflow after allowing settling of soil be let into the nearby waterways. The silt trap should be of sufficient dimensions to catch all the silt water being pumped out during one season. The silt trap should be cleaned of all the deposited silt at the end of the season and kept ready for taking care of the silt in the next season.
32. The lease holder shall undertake adequate safeguard measures during extraction of material and ensure that due to this activity, the hydro-geological regime of the surrounding area shall not be affected. Regular monitoring of ground water level and quality shall be carried out around the mine lease area during the mining operation. If at any stage, if it is observed that the groundwater table is getting depleted due to the mining activity; necessary corrective measures shall be carried out. District Collector/mining officer shall ensure this.
33. No tree-felling shall be done in the leased area, except only with the permission from competent Authority.
34. To take up environmental monitoring of the proposed quarry site before, during and after the mining activities including vibration study data, water, air & flora/fauna environment, slurry water generated/disposed and method of disposal, involving a reputed academic Institution.
35. It shall be ensured that the total extent of nearby quarries(existing, abandoned and proposed) located within 500 meter radius from the periphery of this quarry is not exceeding 5 hectares within the mining lease period of this application.
36. It shall be ensured that there is no habitation is located within 300 meter radius from the periphery of the quarry site and also ensure that no hindrance will be caused to the people of the habitation located within 300m radius from the periphery of the quarry site.
37. Free Silica test should be conducted and reported to TNPCB, Department of Geology and Mining and Regional Director, MoEF& CC, GOI.



*P. Jeyaraj*  
MEMBER SECRETARY  
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38. Air sampling at intersection point should be conducted and reported to TNPCB, Department of Geology and Mining and Regional Director, MoEF& CC, GOI.
39. Bunds to be provided at the boundary of the project site.
40. The project proponent shall undertake plantation/afforestation work by planting the native species on all side of the lease-area at the rate of 400/Ha. Suitable tall tree saplings should be planted on the bunds and other suitable areas in and around the work place.
41. Floor of excavated pit to be levelled and sides to be sloped with gentle slope (Except for granite quarries) in the mine closure phase.
42. The Project Proponent shall ensure a minimum of 2.5% of the annual turnover will be utilized for the CSR Activity
43. The Project Proponent shall provide solar lighting system to the nearby villages.
44. Earthen bunds and barbed wire fencing around the pits with green belt all along the boundary shall be developed and maintained.
45. Safety equipments to be provided to all the employees.
46. Safety distance of 50m has to be provided in case of railway, reservoir, canal/odai
47. The Assistant/Deputy Director, Department of Geology & mining shall ensure that the proponent has engaged the blaster with valid Blasting license/certificate obtained from the competent authority before execution of mining lease.
48. The proponent shall furnish the Baseline data covering the Air, Water, Noise and land environment quality for the proposed quarry site before execution of mining lease.
49. The proponent shall erect the pillars in accordance with the Rules for depicting GPS details in the earmarked boundary of the quarry site to monitor electronically before execution of mining.
50. The proponent has to provide insurance protection to the workers in the case of existing mining or provide the affidavit in case of fresh lease before execution of mining lease.
51. The proponent has to display the name board at the quarry site showing the details of Proponent, lease period, extent, etc., with respect to the existing activity before execution of mining.
52. Heavy earth machinery equipments if utilized, after getting approval from the competent authority.



*Rajendra P.*  
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53. The Proponent shall ensure that the project activity including blasting, mining transportation etc should in no way have adverse impact to the other forests, such as reserve forests and social forests, tree plantation and bio diversity, surrounding water bodies etc.
54. The proponent shall provide Green Belt development at the rate of not less than 400 trees/Hectare. The tree saplings shall be not less than 3m height.
55. The fugitive emissions should be monitored during the mining activity and should be reported to TNPCB once in a month and the operation of the quarry should no way impact the agriculture activity & water bodies near the project site.
56. All the commitment made by the project proponent in the proposal shall be strictly followed.
57. The mining lease holders shall, after ceasing mining operations, undertake re-grassing the mining area and any other area which may have been disturbed due to their mining activities and restore the land to a condition which is fit for growth of fodder, flora, fauna etc.
58. The Project proponent has to strictly comply the outcome/direction of the Hon'ble NGT, Principle Bench, New Delhi in the O.A No.186 of 2016 (M.A.No.350/2016), O.A. No.200/2016, O.A.No.580/2016 (M.A.No.1182/2016), O.A.No.102/2017, 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), 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).

**Part B: General Conditions:**

1. EC is given only on the factual records, documents and the commitment furnished in non judicial stamp paper by the proponent.
2. The Proponent shall obtain the Consent from the TNPC Board before commencing the activity.
3. No change in mining technology and scope of working should be made without prior approval of the SEIAA, Tamil Nadu.
4. No change in the calendar plan including excavation, quantum of mineral (minor mineral) should be made.
5. Effective safeguard measures, such as regular water sprinkling shall be carried out in critical areas prone to air pollution and having high levels of particulate matter such as loading and unloading point and all transfer points. Extensive water sprinkling shall be carried out on haul roads. It should be ensured that the Ambient Air Quality parameters conform to the norms prescribed by the Central Pollution Control Board in this regard.



  
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6. Effective safeguards shall be adopted against health risks on account of breeding of vectors in the water bodies created due to excavation of earth.
7. A berm shall be left from the boundary of adjoining field having a width equal to at least half the depth of proposed excavation.
8. Loading and unloading areas including all the transfer points should also have efficient dust control arrangements. These should be properly maintained and operated.
9. Vehicular emissions shall be kept under control and be regularly monitored. The mineral transportation shall be carried out through the covered trucks only and the vehicles carrying the mineral shall not be overloaded.
10. Access and haul roads to the quarrying area should be restored in a mutually agreeable manner where these are considered unnecessary after extraction has been completed.
11. All Personnel shall be provided with protective respiratory devices including safety shoes, masks, gloves etc. Supervisory people should be provided with adequate training and information on safety and health aspects. Occupational health surveillance program of the workers should be undertaken periodically to observe any contractions due to exposure to dust and take corrective measures, if needed.
12. Periodical medical examination of the workers engaged in the project shall be carried out and records maintained. For the purpose, schedule of health examination of the workers should be drawn and followed accordingly. The workers shall be provided with personnel protective measures such as masks, gloves, boots etc.
13. Workers/labourers shall be provided with facilities for drinking water and sanitation facility for Female and Male separately.
14. The project proponent shall ensure that child labour is not employed in the project as per the sworn affidavit furnished.
15. The funds earmarked for environmental protection measures should be kept in separate account and should not be diverted for other purpose. Year wise expenditure should be reported to the Ministry of Environment and Forests and its Regional Office located at Chennai.
16. The Environmental Clearance does not absolve the applicant/proponent of his obligation/requirement to obtain other statutory and administrative clearances from other statutory and administrative authorities.
17. This Environmental Clearance does not imply that the other statutory / administrative clearances shall be granted to the project by the concerned authorities. Such authorities would



*[Signature]*  
MEMBER SECRETARY  
SEIAA-TN



- be considering the project on merits and be taking decisions independently of the Environmental Clearance
18. The SEIAA, Tamil Nadu may alter/modify the above conditions or stipulate any further conditions in the interest of environment protection.
  19. The SEIAA, Tamil Nadu may cancel the Environmental Clearance granted to this project under the provisions of EIA Notification, 2006, at any stage of the validity of this Environmental Clearance, if it is found or if it comes to the knowledge of this SEIAA, TN that the project proponent has deliberately concealed and/or submitted false or misleading information or inadequate data for obtaining the Environmental Clearance.
  20. Failure to comply with any of the conditions mentioned above may result in withdrawal of this clearance and attract action under the provisions of the Environment (Protection) Act, 1986.
  21. The above conditions will be enforced inter-alia, under the provisions of the Water (Prevention & Control of Pollution) Act, 1974, the Air (Prevention & Control of Pollution) Act, 1981, the Environment (Protection) Act, 1986, the Public Liability Insurance Act, 1991, along with their amendments, Minor Mineral Conservation & Development Rules, 2010 framed under MMDR Act 1957, National Commission for protection of Child Right Rules, 2006, Wildlife Protection Act, 1972, Forest Conservation Act, 1980, Biodiversity Conservation Act, 2016, the Biological Diversity Act, 2002 and Biological diversity Rules, 2004 and Rules made there under and also any other orders passed by the Hon'ble Supreme Court of India/Hon'ble High Court of Madras and any other Courts of Law relating to the subject matter.
  22. Any other conditions stipulated by other Statutory/Government authorities shall be complied.
  23. Any appeal against this Environmental Clearance shall lie with the Hon'ble National Green Tribunal, if preferred, within a period of 30 days as prescribed under Section 16 of the National Green Tribunal Act, 2010.
  24. The Environmental Clearance is issued based on the documents furnished by the project proponent. In case any documents found to be incorrect/not in order at a later date the Environmental Clearance issued to the project will be deemed to be revoked/ cancelled.



*Rajendra P*  
MEMBER SECRETARY  
SEIAA-TN

**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 Principal Secretary to Government, Industries Department, Tamil Nadu.
4. The Additional Principal Chief Conservator of Forests, Regional Office (SZ), 34, HEPC Building, 1<sup>st</sup>& 2<sup>nd</sup> 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 Chairman, TNPC Board, 76, Mount Salai, Guindy, Chennai-32
7. The District Collector, Erode District.
8. The Commissioner of Geology and Mines, Guindy, Chennai-32
9. EIA Division, Ministry of Environment & Forests, Paryavaran Bhawan, New Delhi.
10. Spare.

SEIAA  
TN

**TEST REPORT**

|                           |   |                         |            |
|---------------------------|---|-------------------------|------------|
| <b>Report No</b>          | EHS360/TR/2022-23/001   | <b>Report Date</b>      | 06.06.2024 |
| <b>Site Location</b>      | <b>THIRU. N.T. SAISADA ROUGH STONE AND GRAVEL QUARRY</b><br>S.F.No.: 151(P) & 152/4, Extent: 2.28.40Ha, Kurumbapalayam Village,<br>Sathiyamangalam Taluk, Erode District. |                         |            |
| <b>Sampling Method</b>    | IS 5182   | <b>Sample Drawn by</b>  | Laboratory |
| <b>Sample Name</b>        | Air   | <b>Sample Code</b>      | EHS360/001 |
| <b>Sample Description</b> | Ambient Air Quality Monitoring  | <b>Sample Condition</b> | Good       |
| <b>Sampling Location</b>  | <b>AAQ1 Core zone - Project Area - 11°25'51.28"N 77°10'12.14"E</b>  |                         |            |

| Date           | Period. hrs | PM10(µg/m3) | PM2.5(µg/m3) | SO2 (µg/m3) | NO2 (µg/m3) | O3 (µg/m3)  | NH3 (µg/m3) | CO (mg/ m3)  |
|----------------|-------------|-------------|--------------|-------------|-------------|-------------|-------------|--------------|
| 04.03.2024     | 7:00-7:00   | 43.4        | 21.3         | 7.2         | 23.5        | BDL(DL:5.0) | BDL(DL:1.0) | BDL(DL:1.14) |
| 05.03.2024     | 7:15-7:15   | 42.9        | 21.9         | 7.9         | 24.6        | BDL(DL:5.0) | BDL(DL:1.0) | BDL(DL:1.14) |
| 11.03.2024     | 7:00-7:00   | 42.5        | 21.6         | 8.3         | 22.7        | BDL(DL:5.0) | BDL(DL:1.0) | BDL(DL:1.14) |
| 12.03.2024     | 7:15-7:15   | 43.6        | 22.1         | 7.6         | 24.3        | BDL(DL:5.0) | BDL(DL:1.0) | BDL(DL:1.14) |
| 18.03.2024     | 7:00-7:00   | 42.6        | 22.4         | 7.4         | 24.4        | BDL(DL:5.0) | BDL(DL:1.0) | BDL(DL:1.14) |
| 19.03.2024     | 7:15-7:15   | 42.1        | 23.1         | 8.1         | 24.9        | BDL(DL:5.0) | BDL(DL:1.0) | BDL(DL:1.14) |
| 25.03.2024     | 7:00-7:00   | 43.2        | 22.7         | 7.2         | 23.8        | BDL(DL:5.0) | BDL(DL:1.0) | BDL(DL:1.14) |
| 26.03.2024     | 7:15-7:15   | 43.9        | 21.8         | 7.6         | 23.5        | BDL(DL:5.0) | BDL(DL:1.0) | BDL(DL:1.14) |
| 01.04.2024     | 7:00-7:00   | 44.1        | 21.9         | 7.3         | 24.6        | BDL(DL:5.0) | BDL(DL:1.0) | BDL(DL:1.14) |
| 02.04.2024     | 7:15-7:15   | 43.1        | 21.0         | 7.9         | 24.7        | BDL(DL:5.0) | BDL(DL:1.0) | BDL(DL:1.14) |
| 08.04.2024     | 7:00-7:00   | 42.6        | 21.7         | 6.8         | 22.3        | BDL(DL:5.0) | BDL(DL:1.0) | BDL(DL:1.14) |
| 09.04.2024     | 7:15-7:15   | 42.5        | 22.7         | 6.9         | 22.5        | BDL(DL:5.0) | BDL(DL:1.0) | BDL(DL:1.14) |
| 15.04.2024     | 7:00-7:00   | 43.5        | 22.4         | 6.7         | 23.7        | BDL(DL:5.0) | BDL(DL:1.0) | BDL(DL:1.14) |
| 16.04.2024     | 7:15-7:15   | 42.8        | 21.4         | 7.5         | 25.3        | BDL(DL:5.0) | BDL(DL:1.0) | BDL(DL:1.14) |
| 22.04.2024     | 7:00-7:00   | 42.5        | 22.4         | 7.5         | 21.2        | BDL(DL:5.0) | BDL(DL:1.0) | BDL(DL:1.14) |
| 23.04.2024     | 7:15-7:15   | 43.7        | 21.0         | 7.5         | 22.6        | BDL(DL:5.0) | BDL(DL:1.0) | BDL(DL:1.14) |
| 29.04.2024     | 7:00-7:00   | 42.4        | 21.1         | 7.5         | 23.2        | BDL(DL:5.0) | BDL(DL:1.0) | BDL(DL:1.14) |
| 30.04.2024     | 7:15-7:15   | 43.5        | 21.6         | 7.8         | 21.8        | BDL(DL:5.0) | BDL(DL:1.0) | BDL(DL:1.14) |
| 06.05.2024     | 7:00-7:00   | 42.6        | 21.9         | 8.2         | 22.9        | BDL(DL:5.0) | BDL(DL:1.0) | BDL(DL:1.14) |
| 07.05.2024     | 7:15-7:15   | 42.9        | 21.0         | 8.7         | 23.7        | BDL(DL:5.0) | BDL(DL:1.0) | BDL(DL:1.14) |
| 13.05.2024     | 7:00-7:00   | 43.4        | 23.6         | 7.3         | 21.8        | BDL(DL:5.0) | BDL(DL:1.0) | BDL(DL:1.14) |
| 14.05.2024     | 7:15-7:15   | 44.8        | 22.8         | 6.5         | 23.7        | BDL(DL:5.0) | BDL(DL:1.0) | BDL(DL:1.14) |
| 20.05.2024     | 7:00-7:00   | 42.4        | 22.1         | 6.8         | 22.7        | BDL(DL:5.0) | BDL(DL:1.0) | BDL(DL:1.14) |
| 21.05.2024     | 7:15-7:15   | 43.1        | 21.5         | 6.4         | 21.9        | BDL(DL:5.0) | BDL(DL:1.0) | BDL(DL:1.14) |
| 27.05.2024     | 7:00-7:00   | 44.6        | 22.3         | 6.8         | 24.4        | BDL(DL:5.0) | BDL(DL:1.0) | BDL(DL:1.14) |
| 29.05.2024     | 7:15-7:15   | 45.8        | 22.7         | 7.1         | 23.8        | BDL(DL:5.0) | BDL(DL:1.0) | BDL(DL:1.14) |
| NAAQ* Standard |             | <100        | <100         | <80         | <80         | <100        | <400        | <4           |

**Note:** BDL: Below Detection Limit ;DL: Detection Limit

**Remarks:** The values observed for the pollutants given above are within the CPCB standards.

\*\*\*\*\*End of Report\*\*\*\*\*

Page 1 of 1

Verified by



Authorised Signatory

Name: Santhosh Kumar A  
Designation: Quality Manager

- Note: 1. The test results are only to the sample submitted for test. 2. Any correction of the test report in full or part shall invalidate the report. 3. Sample will be retained for 15 days from the date of reporting except in case of regulatory samples or specifically instructed by client. 4. Perishable samples will be discarded immediately after reporting. 5. Under no circumstance's lab accepts any liability or loss/damage caused by use or misuse of test report after invoicing or issued of test report.

**TEST REPORT**

|                           |   |                         |            |
|---------------------------|---|-------------------------|------------|
| <b>Report No</b>          | EHS360/TR/2022-23/001   | <b>Report Date</b>      | 06.06.2024 |
| <b>Site Location</b>      | <b>THIRU. N.T. SAISADA ROUGH STONE AND GRAVEL QUARRY</b><br>S.F.No.: 151(P) & 152/4, Extent: 2.28.40Ha, Kurumbapalayam Village,<br>Sathiyamangalam Taluk, Erode District. |                         |            |
| <b>Sampling Method</b>    | IS 5182   | <b>Sample Drawn by</b>  | Laboratory |
| <b>Sample Name</b>        | Air   | <b>Sample Code</b>      | EHS360/001 |
| <b>Sample Description</b> | Ambient Air Quality Monitoring  | <b>Sample Condition</b> | Good       |
| <b>Sampling Location</b>  | <b>AAQ1 Core zone - Project Area - 11°25'51.28"N 77°10'12.14"E</b>  |                         |            |

| Date           | Period. hrs | SPM ( $\mu\text{g}/\text{m}^3$ ) | As ( $\text{ng}/\text{m}^3$ ) | C6H6 ( $\mu\text{g}/\text{m}^3$ ) | BaP ( $\text{ng}/\text{m}^3$ ) | Pb ( $\mu\text{g}/\text{m}^3$ ) | Ni ( $\text{ng}/\text{m}^3$ ) |
|----------------|-------------|----------------------------------|-------------------------------|-----------------------------------|--------------------------------|---------------------------------|-------------------------------|
| 04.03.2024     | 7:00-7:00   | 66.9                             | BDL (DL:0.1)                  | BDL (DL:1.0)                      | BDL (DL:1.0)                   | BDL (DL:0.1)                    | BDL (DL:0.1)                  |
| 05.03.2024     | 7:15-7:15   | 67.5                             | BDL (DL:0.1)                  | BDL (DL:1.0)                      | BDL (DL:1.0)                   | BDL (DL:0.1)                    | BDL (DL:0.1)                  |
| 11.03.2024     | 7:00-7:00   | 67.2                             | BDL (DL:0.1)                  | BDL (DL:1.0)                      | BDL (DL:1.0)                   | BDL (DL:0.1)                    | BDL (DL:0.1)                  |
| 12.03.2024     | 7:15-7:15   | 67.8                             | BDL (DL:0.1)                  | BDL (DL:1.0)                      | BDL (DL:1.0)                   | BDL (DL:0.1)                    | BDL (DL:0.1)                  |
| 18.03.2024     | 7:00-7:00   | 67.4                             | BDL (DL:0.1)                  | BDL (DL:1.0)                      | BDL (DL:1.0)                   | BDL (DL:0.1)                    | BDL (DL:0.1)                  |
| 19.03.2024     | 7:15-7:15   | 67.8                             | BDL (DL:0.1)                  | BDL (DL:1.0)                      | BDL (DL:1.0)                   | BDL (DL:0.1)                    | BDL (DL:0.1)                  |
| 25.03.2024     | 7:00-7:00   | 69.2                             | BDL (DL:0.1)                  | BDL (DL:1.0)                      | BDL (DL:1.0)                   | BDL (DL:0.1)                    | BDL (DL:0.1)                  |
| 26.03.2024     | 7:15-7:15   | 68.4                             | BDL (DL:0.1)                  | BDL (DL:1.0)                      | BDL (DL:1.0)                   | BDL (DL:0.1)                    | BDL (DL:0.1)                  |
| 01.04.2024     | 7:00-7:00   | 68.8                             | BDL (DL:0.1)                  | BDL (DL:1.0)                      | BDL (DL:1.0)                   | BDL (DL:0.1)                    | BDL (DL:0.1)                  |
| 02.04.2024     | 7:15-7:15   | 68.1                             | BDL (DL:0.1)                  | BDL (DL:1.0)                      | BDL (DL:1.0)                   | BDL (DL:0.1)                    | BDL (DL:0.1)                  |
| 08.04.2024     | 7:00-7:00   | 67.2                             | BDL (DL:0.1)                  | BDL (DL:1.0)                      | BDL (DL:1.0)                   | BDL (DL:0.1)                    | BDL (DL:0.1)                  |
| 09.04.2024     | 7:15-7:15   | 67.5                             | BDL (DL:0.1)                  | BDL (DL:1.0)                      | BDL (DL:1.0)                   | BDL (DL:0.1)                    | BDL (DL:0.1)                  |
| 15.04.2024     | 7:00-7:00   | 68.2                             | BDL (DL:0.1)                  | BDL (DL:1.0)                      | BDL (DL:1.0)                   | BDL (DL:0.1)                    | BDL (DL:0.1)                  |
| 16.04.2024     | 7:15-7:15   | 68.9                             | BDL (DL:0.1)                  | BDL (DL:1.0)                      | BDL (DL:1.0)                   | BDL (DL:0.1)                    | BDL (DL:0.1)                  |
| 22.04.2024     | 7:00-7:00   | 68.1                             | BDL (DL:0.1)                  | BDL (DL:1.0)                      | BDL (DL:1.0)                   | BDL (DL:0.1)                    | BDL (DL:0.1)                  |
| 23.04.2024     | 7:15-7:15   | 67.4                             | BDL (DL:0.1)                  | BDL (DL:1.0)                      | BDL (DL:1.0)                   | BDL (DL:0.1)                    | BDL (DL:0.1)                  |
| 29.04.2024     | 7:00-7:00   | 67.6                             | BDL (DL:0.1)                  | BDL (DL:1.0)                      | BDL (DL:1.0)                   | BDL (DL:0.1)                    | BDL (DL:0.1)                  |
| 30.04.2024     | 7:15-7:15   | 66.4                             | BDL (DL:0.1)                  | BDL (DL:1.0)                      | BDL (DL:1.0)                   | BDL (DL:0.1)                    | BDL (DL:0.1)                  |
| 06.05.2024     | 7:00-7:00   | 66.8                             | BDL (DL:0.1)                  | BDL (DL:1.0)                      | BDL (DL:1.0)                   | BDL (DL:0.1)                    | BDL (DL:0.1)                  |
| 07.05.2024     | 7:15-7:15   | 66.5                             | BDL (DL:0.1)                  | BDL (DL:1.0)                      | BDL (DL:1.0)                   | BDL (DL:0.1)                    | BDL (DL:0.1)                  |
| 13.05.2024     | 7:00-7:00   | 64.2                             | BDL (DL:0.1)                  | BDL (DL:1.0)                      | BDL (DL:1.0)                   | BDL (DL:0.1)                    | BDL (DL:0.1)                  |
| 14.05.2024     | 7:15-7:15   | 67.8                             | BDL (DL:0.1)                  | BDL (DL:1.0)                      | BDL (DL:1.0)                   | BDL (DL:0.1)                    | BDL (DL:0.1)                  |
| 20.05.2024     | 7:00-7:00   | 67.9                             | BDL (DL:0.1)                  | BDL (DL:1.0)                      | BDL (DL:1.0)                   | BDL (DL:0.1)                    | BDL (DL:0.1)                  |
| 21.05.2024     | 7:15-7:15   | 68.2                             | BDL (DL:0.1)                  | BDL (DL:1.0)                      | BDL (DL:1.0)                   | BDL (DL:0.1)                    | BDL (DL:0.1)                  |
| 27.05.2024     | 7:00-7:00   | 68.9                             | BDL (DL:0.1)                  | BDL (DL:1.0)                      | BDL (DL:1.0)                   | BDL (DL:0.1)                    | BDL (DL:0.1)                  |
| 29.05.2024     | 7:15-7:15   | 68.6                             | BDL (DL:0.1)                  | BDL (DL:1.0)                      | BDL (DL:1.0)                   | BDL (DL:0.1)                    | BDL (DL:0.1)                  |
| NAAQ* Standard |             | <200                             | <200                          | <100                              | <60                            | <80                             | <80                           |

**Note:** BDL: Below Detection Limit ;DL: Detection Limit

**Remarks:** The values observed for the pollutants given above are within the CPCB standards.

\*\*\*\*\*End of Report\*\*\*\*\*



Verified by

*[Signature]*

Authorised Signatory

Name: Santhosh Kumar A  
Designation: Quality Manager

- Note: 1. The test results are only to the sample submitted for test. 2. Any correction of the test report in full or part shall invalidate the report. 3. Sample will be retained for 15 days from the date of reporting except in case of regulatory samples or specifically instructed by client. 4. Perishable samples will be discarded immediately after reporting. 5. Under no circumstance's lab accepts any liability or loss/damage caused by use or misuse of test report after invoicing or issued of test report.

**TEST REPORT**

|                           |   |                         |            |
|---------------------------|---|-------------------------|------------|
| <b>Report No</b>          | EHS360/TR/2022-23/002   | <b>Report Date</b>      | 06.06.2024 |
| <b>Site Location</b>      | <b>THIRU. N.T. SAISADA ROUGH STONE AND GRAVEL QUARRY</b><br>S.F.No.: 151(P) & 152/4, Extent: 2.28.40Ha, Kurumbapalayam Village,<br>Sathiyamangalam Taluk, Erode District. |                         |            |
| <b>Sampling Method</b>    | IS 5182   | <b>Sample Drawn by</b>  | Laboratory |
| <b>Sample Name</b>        | Air   | <b>Sample Code</b>      | EHS360/002 |
| <b>Sample Description</b> | Ambient Air Quality Monitoring  | <b>Sample Condition</b> | Good       |
| <b>Sampling Location</b>  | <b>AAQ 2 – Core Zone - Near Existing Quarry - 11°25'58.06"N 77°10'26.56"E</b>   |                         |            |

| Date           | Period. hrs | PM10(µg/m3) | PM2.5(µg/m3) | SO2 (µg/m3) | NO2 (µg/m3) | O3 (µg/m3)  | NH3 (µg/m3) | CO (mg/ m3)  |
|----------------|-------------|-------------|--------------|-------------|-------------|-------------|-------------|--------------|
| 04.03.2024     | 7:00-7:00   | 42.5        | 19.2         | 6.5         | 21.5        | BDL(DL:5.0) | BDL(DL:1.0) | BDL(DL:1.14) |
| 05.03.2024     | 7:15-7:15   | 42.9        | 21.9         | 6.3         | 21.1        | BDL(DL:5.0) | BDL(DL:1.0) | BDL(DL:1.14) |
| 11.03.2024     | 7:00-7:00   | 43.6        | 19.5         | 6.7         | 22.3        | BDL(DL:5.0) | BDL(DL:1.0) | BDL(DL:1.14) |
| 12.03.2024     | 7:15-7:15   | 43.2        | 20.2         | 6.4         | 22.1        | BDL(DL:5.0) | BDL(DL:1.0) | BDL(DL:1.14) |
| 18.03.2024     | 7:00-7:00   | 44.6        | 21.2         | 6.1         | 23.2        | BDL(DL:5.0) | BDL(DL:1.0) | BDL(DL:1.14) |
| 19.03.2024     | 7:15-7:15   | 43.1        | 19.9         | 6.3         | 22.8        | BDL(DL:5.0) | BDL(DL:1.0) | BDL(DL:1.14) |
| 25.03.2024     | 7:00-7:00   | 42.9        | 20.3         | 6.8         | 21.6        | BDL(DL:5.0) | BDL(DL:1.0) | BDL(DL:1.14) |
| 26.03.2024     | 7:15-7:15   | 42.1        | 20.4         | 6.9         | 21.3        | BDL(DL:5.0) | BDL(DL:1.0) | BDL(DL:1.14) |
| 01.04.2024     | 7:00-7:00   | 44.6        | 18.7         | 6.4         | 23.4        | BDL(DL:5.0) | BDL(DL:1.0) | BDL(DL:1.14) |
| 02.04.2024     | 7:15-7:15   | 44.6        | 18.2         | 6.2         | 23.9        | BDL(DL:5.0) | BDL(DL:1.0) | BDL(DL:1.14) |
| 08.04.2024     | 7:00-7:00   | 42.8        | 20.3         | 7.3         | 21.9        | BDL(DL:5.0) | BDL(DL:1.0) | BDL(DL:1.14) |
| 09.04.2024     | 7:15-7:15   | 42.5        | 21.9         | 7.4         | 21.1        | BDL(DL:5.0) | BDL(DL:1.0) | BDL(DL:1.14) |
| 15.04.2024     | 7:00-7:00   | 41.3        | 21.6         | 7.1         | 23.4        | BDL(DL:5.0) | BDL(DL:1.0) | BDL(DL:1.14) |
| 16.04.2024     | 7:15-7:15   | 42.6        | 22.9         | 7.5         | 22.7        | BDL(DL:5.0) | BDL(DL:1.0) | BDL(DL:1.14) |
| 22.04.2024     | 7:00-7:00   | 42.5        | 20.1         | 7.2         | 23.1        | BDL(DL:5.0) | BDL(DL:1.0) | BDL(DL:1.14) |
| 23.04.2024     | 7:15-7:15   | 43.6        | 19.5         | 7.8         | 24.3        | BDL(DL:5.0) | BDL(DL:1.0) | BDL(DL:1.14) |
| 29.04.2024     | 7:00-7:00   | 43.4        | 19.3         | 7.3         | 22.7        | BDL(DL:5.0) | BDL(DL:1.0) | BDL(DL:1.14) |
| 30.04.2024     | 7:15-7:15   | 42.8        | 20.1         | 7.4         | 21.5        | BDL(DL:5.0) | BDL(DL:1.0) | BDL(DL:1.14) |
| 06.05.2024     | 7:00-7:00   | 42.3        | 21.2         | 7.9         | 21.9        | BDL(DL:5.0) | BDL(DL:1.0) | BDL(DL:1.14) |
| 07.05.2024     | 7:15-7:15   | 43.9        | 20.8         | 6.1         | 22.3        | BDL(DL:5.0) | BDL(DL:1.0) | BDL(DL:1.14) |
| 13.05.2024     | 7:00-7:00   | 43.5        | 19.3         | 6.2         | 22.7        | BDL(DL:5.0) | BDL(DL:1.0) | BDL(DL:1.14) |
| 14.05.2024     | 7:15-7:15   | 43.9        | 18.9         | 6.8         | 22.1        | BDL(DL:5.0) | BDL(DL:1.0) | BDL(DL:1.14) |
| 20.05.2024     | 7:00-7:00   | 41.6        | 20.5         | 6.1         | 22.8        | BDL(DL:5.0) | BDL(DL:1.0) | BDL(DL:1.14) |
| 21.05.2024     | 7:15-7:15   | 42.1        | 21.1         | 7.3         | 22.7        | BDL(DL:5.0) | BDL(DL:1.0) | BDL(DL:1.14) |
| 27.05.2024     | 7:00-7:00   | 42.7        | 21.4         | 7.9         | 24.1        | BDL(DL:5.0) | BDL(DL:1.0) | BDL(DL:1.14) |
| 29.05.2024     | 7:15-7:15   | 42.8        | 20.2         | 7.7         | 23.4        | BDL(DL:5.0) | BDL(DL:1.0) | BDL(DL:1.14) |
| NAAQ* Standard |             | <100        | <100         | <60         | <80         | <80         | <100        | <400         |

**Note:** BDL: Below Detection Limit ;DL: Detection Limit

**Remarks:** The values observed for the pollutants given above are within the CPCB standards.

\*\*\*\*\*End of Report\*\*\*\*\*

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Verified by



Authorised Signatory

Name: Santhosh Kumar A  
Designation : Quality Manager

- Note: 1. The test results are only to the sample submitted for test. 2. Any correction of the test report in full or part shall invalidate the report. 3. Sample will be retained for 15 days from the date of reporting except in case of regulatory samples or specifically instructed by client. 4. Perishable samples will be discarded immediately after reporting. 5. Under no circumstance's lab accepts any liability or loss/damage caused by use or misuse of test report after invoicing or issued of test report.

## TEST REPORT

|                           |  |                         |            |
|---------------------------|--|-------------------------|------------|
| <b>Report No</b>          | EHS360/TR/2022-23/002  | <b>Report Date</b>      | 06.06.2024 |
| <b>Site Location</b>      | THIRU. N.T. SAISADA ROUGH STONE AND GRAVEL QUARRY<br>S.F.No.: 151(P) & 152/4, Extent: 2.28.40Ha, Kurumbapalayam Village,<br>Sathiyamangalam Taluk, Erode District. |                         |            |
| <b>Sampling Method</b>    | IS 5182  | <b>Sample Drawn by</b>  | Laboratory |
| <b>Sample Name</b>        | Air  | <b>Sample Code</b>      | EHS360/002 |
| <b>Sample Description</b> | Ambient Air Quality Monitoring   | <b>Sample Condition</b> | Good       |
| <b>Sampling Location</b>  | AAQ 2 – Core Zone - Near Existing Quarry - 11°25'58.06"N 77°10'26.56"E   |                         |            |

| Date           | Period. hrs | SPM (µg/m <sup>3</sup> ) | As (ng/m <sup>3</sup> ) | C6H6 (µg/m <sup>3</sup> ) | BaP (ng/m <sup>3</sup> ) | Pb (µg/m <sup>3</sup> ) | Ni (ng/m <sup>3</sup> ) |
|----------------|-------------|--------------------------|-------------------------|---------------------------|--------------------------|-------------------------|-------------------------|
| 04.03.2024     | 7:00-7:00   | 63.8                     | BDL (DL:0.1)            | BDL (DL:1.0)              | BDL (DL:1.0)             | BDL (DL:0.1)            | BDL (DL:0.1)            |
| 05.03.2024     | 7:15-7:15   | 62.2                     | BDL (DL:0.1)            | BDL (DL:1.0)              | BDL (DL:1.0)             | BDL (DL:0.1)            | BDL (DL:0.1)            |
| 11.03.2024     | 7:00-7:00   | 64.2                     | BDL (DL:0.1)            | BDL (DL:1.0)              | BDL (DL:1.0)             | BDL (DL:0.1)            | BDL (DL:0.1)            |
| 12.03.2024     | 7:15-7:15   | 63.8                     | BDL (DL:0.1)            | BDL (DL:1.0)              | BDL (DL:1.0)             | BDL (DL:0.1)            | BDL (DL:0.1)            |
| 18.03.2024     | 7:00-7:00   | 64.5                     | BDL (DL:0.1)            | BDL (DL:1.0)              | BDL (DL:1.0)             | BDL (DL:0.1)            | BDL (DL:0.1)            |
| 19.03.2024     | 7:15-7:15   | 63.7                     | BDL (DL:0.1)            | BDL (DL:1.0)              | BDL (DL:1.0)             | BDL (DL:0.1)            | BDL (DL:0.1)            |
| 25.03.2024     | 7:00-7:00   | 62.5                     | BDL (DL:0.1)            | BDL (DL:1.0)              | BDL (DL:1.0)             | BDL (DL:0.1)            | BDL (DL:0.1)            |
| 26.03.2024     | 7:15-7:15   | 62.9                     | BDL (DL:0.1)            | BDL (DL:1.0)              | BDL (DL:1.0)             | BDL (DL:0.1)            | BDL (DL:0.1)            |
| 01.04.2024     | 7:00-7:00   | 64.5                     | BDL (DL:0.1)            | BDL (DL:1.0)              | BDL (DL:1.0)             | BDL (DL:0.1)            | BDL (DL:0.1)            |
| 02.04.2024     | 7:15-7:15   | 63.7                     | BDL (DL:0.1)            | BDL (DL:1.0)              | BDL (DL:1.0)             | BDL (DL:0.1)            | BDL (DL:0.1)            |
| 08.04.2024     | 7:00-7:00   | 63.9                     | BDL (DL:0.1)            | BDL (DL:1.0)              | BDL (DL:1.0)             | BDL (DL:0.1)            | BDL (DL:0.1)            |
| 09.04.2024     | 7:15-7:15   | 63.5                     | BDL (DL:0.1)            | BDL (DL:1.0)              | BDL (DL:1.0)             | BDL (DL:0.1)            | BDL (DL:0.1)            |
| 15.04.2024     | 7:00-7:00   | 64.4                     | BDL (DL:0.1)            | BDL (DL:1.0)              | BDL (DL:1.0)             | BDL (DL:0.1)            | BDL (DL:0.1)            |
| 16.04.2024     | 7:15-7:15   | 64.8                     | BDL (DL:0.1)            | BDL (DL:1.0)              | BDL (DL:1.0)             | BDL (DL:0.1)            | BDL (DL:0.1)            |
| 22.04.2024     | 7:00-7:00   | 63.8                     | BDL (DL:0.1)            | BDL (DL:1.0)              | BDL (DL:1.0)             | BDL (DL:0.1)            | BDL (DL:0.1)            |
| 23.04.2024     | 7:15-7:15   | 63.5                     | BDL (DL:0.1)            | BDL (DL:1.0)              | BDL (DL:1.0)             | BDL (DL:0.1)            | BDL (DL:0.1)            |
| 29.04.2024     | 7:00-7:00   | 62.2                     | BDL (DL:0.1)            | BDL (DL:1.0)              | BDL (DL:1.0)             | BDL (DL:0.1)            | BDL (DL:0.1)            |
| 30.04.2024     | 7:15-7:15   | 63.2                     | BDL (DL:0.1)            | BDL (DL:1.0)              | BDL (DL:1.0)             | BDL (DL:0.1)            | BDL (DL:0.1)            |
| 06.05.2024     | 7:00-7:00   | 64.5                     | BDL (DL:0.1)            | BDL (DL:1.0)              | BDL (DL:1.0)             | BDL (DL:0.1)            | BDL (DL:0.1)            |
| 07.05.2024     | 7:15-7:15   | 63.9                     | BDL (DL:0.1)            | BDL (DL:1.0)              | BDL (DL:1.0)             | BDL (DL:0.1)            | BDL (DL:0.1)            |
| 13.05.2024     | 7:00-7:00   | 63.7                     | BDL (DL:0.1)            | BDL (DL:1.0)              | BDL (DL:1.0)             | BDL (DL:0.1)            | BDL (DL:0.1)            |
| 14.05.2024     | 7:15-7:15   | 64.8                     | BDL (DL:0.1)            | BDL (DL:1.0)              | BDL (DL:1.0)             | BDL (DL:0.1)            | BDL (DL:0.1)            |
| 20.05.2024     | 7:00-7:00   | 63.9                     | BDL (DL:0.1)            | BDL (DL:1.0)              | BDL (DL:1.0)             | BDL (DL:0.1)            | BDL (DL:0.1)            |
| 21.05.2024     | 7:15-7:15   | 64.8                     | BDL (DL:0.1)            | BDL (DL:1.0)              | BDL (DL:1.0)             | BDL (DL:0.1)            | BDL (DL:0.1)            |
| 27.05.2024     | 7:00-7:00   | 64.9                     | BDL (DL:0.1)            | BDL (DL:1.0)              | BDL (DL:1.0)             | BDL (DL:0.1)            | BDL (DL:0.1)            |
| 29.05.2024     | 7:15-7:15   | 63.1                     | BDL (DL:0.1)            | BDL (DL:1.0)              | BDL (DL:1.0)             | BDL (DL:0.1)            | BDL (DL:0.1)            |
| NAAQ* Standard |             | <200                     | <200                    | <100                      | <60                      | <80                     | <80                     |

**Note:** BDL: Below Detection Limit ;DL: Detection Limit  
**Remarks:** The values observed for the pollutants given above are within the CPCB standards.

\*\*\*\*\*End of Report\*\*\*\*\*



Verified by

Authorised Signatory

Name: Santhosh Kumar A  
 Designation: Quality Manager

- Note: 1. The test results are only to the sample submitted for test. 2. Any correction of the test report in full or part shall invalidate the report. 3. Sample will be retained for 15 days from the date of reporting except in case of regulatory samples or specifically instructed by client. 4. Perishable samples will be discarded immediately after reporting. 5. Under no circumstance's lab accepts any liability or loss/damage caused by use or misuse of test report after invoicing or issued of test report.

**TEST REPORT**

|                           |   |                         |            |
|---------------------------|---|-------------------------|------------|
| <b>Report No</b>          | EHS360/TR/2022-23/003   | <b>Report Date</b>      | 06.06.2024 |
| <b>Site Location</b>      | <b>THIRU. N.T. SAISADA ROUGH STONE AND GRAVEL QUARRY</b><br>S.F.No.: 151(P) & 152/4, Extent: 2.28.40Ha, Kurumbapalayam Village,<br>Sathiyamangalam Taluk, Erode District. |                         |            |
| <b>Sampling Method</b>    | IS 5182   | <b>Sample Drawn by</b>  | Laboratory |
| <b>Sample Name</b>        | Air   | <b>Sample Code</b>      | EHS360/003 |
| <b>Sample Description</b> | Ambient Air Quality Monitoring  | <b>Sample Condition</b> | Good       |
| <b>Sampling Location</b>  | <b>AAQ3 – Kurumbapalayam - 11°25'21.81"N 77°10'30.46"E</b>  |                         |            |

| Date           | Period. hrs | PM10(µg/m3) | PM2.5(µg/m3) | SO2 (µg/m3) | NO2 (µg/m3) | O3 (µg/m3)  | NH3 (µg/m3) | CO (mg/ m3)  |
|----------------|-------------|-------------|--------------|-------------|-------------|-------------|-------------|--------------|
| 04.03.2024     | 7:00-7:00   | 42.9        | 22.7         | 7.9         | 24.9        | BDL(DL:5.0) | BDL(DL:1.0) | BDL(DL:1.14) |
| 05.03.2024     | 7:15-7:15   | 40.7        | 23.4         | 6.3         | 26.2        | BDL(DL:5.0) | BDL(DL:1.0) | BDL(DL:1.14) |
| 11.03.2024     | 7:00-7:00   | 41.5        | 22.9         | 7.7         | 25.8        | BDL(DL:5.0) | BDL(DL:1.0) | BDL(DL:1.14) |
| 12.03.2024     | 7:15-7:15   | 42.6        | 22.6         | 8.3         | 27.3        | BDL(DL:5.0) | BDL(DL:1.0) | BDL(DL:1.14) |
| 18.03.2024     | 7:00-7:00   | 40.7        | 21.5         | 7.4         | 26.5        | BDL(DL:5.0) | BDL(DL:1.0) | BDL(DL:1.14) |
| 19.03.2024     | 7:15-7:15   | 42.7        | 22.9         | 5.7         | 24.9        | BDL(DL:5.0) | BDL(DL:1.0) | BDL(DL:1.14) |
| 25.03.2024     | 7:00-7:00   | 41.9        | 21.6         | 6.3         | 25.3        | BDL(DL:5.0) | BDL(DL:1.0) | BDL(DL:1.14) |
| 26.03.2024     | 7:15-7:15   | 42.8        | 22.5         | 8.3         | 25.8        | BDL(DL:5.0) | BDL(DL:1.0) | BDL(DL:1.14) |
| 01.04.2024     | 7:00-7:00   | 41.5        | 21.7         | 8.2         | 26.1        | BDL(DL:5.0) | BDL(DL:1.0) | BDL(DL:1.14) |
| 02.04.2024     | 7:15-7:15   | 42.9        | 21.8         | 6.6         | 25.8        | BDL(DL:5.0) | BDL(DL:1.0) | BDL(DL:1.14) |
| 08.04.2024     | 7:00-7:00   | 42.6        | 22.1         | 6.4         | 25.1        | BDL(DL:5.0) | BDL(DL:1.0) | BDL(DL:1.14) |
| 09.04.2024     | 7:15-7:15   | 42.7        | 22.9         | 7.2         | 26.3        | BDL(DL:5.0) | BDL(DL:1.0) | BDL(DL:1.14) |
| 15.04.2024     | 7:00-7:00   | 41.2        | 21.8         | 6.9         | 26.9        | BDL(DL:5.0) | BDL(DL:1.0) | BDL(DL:1.14) |
| 16.04.2024     | 7:15-7:15   | 41.3        | 22.3         | 9.5         | 29.7        | BDL(DL:5.0) | BDL(DL:1.0) | BDL(DL:1.14) |
| 22.04.2024     | 7:00-7:00   | 42.7        | 21.1         | 8.3         | 25.3        | BDL(DL:5.0) | BDL(DL:1.0) | BDL(DL:1.14) |
| 23.04.2024     | 7:15-7:15   | 41.8        | 22.9         | 8.4         | 25.7        | BDL(DL:5.0) | BDL(DL:1.0) | BDL(DL:1.14) |
| 29.04.2024     | 7:00-7:00   | 40.7        | 21.1         | 6.9         | 26.4        | BDL(DL:5.0) | BDL(DL:1.0) | BDL(DL:1.14) |
| 30.04.2024     | 7:15-7:15   | 41.5        | 22.9         | 7.2         | 26.9        | BDL(DL:5.0) | BDL(DL:1.0) | BDL(DL:1.14) |
| 06.05.2024     | 7:00-7:00   | 42.9        | 22.6         | 8.6         | 25.8        | BDL(DL:5.0) | BDL(DL:1.0) | BDL(DL:1.14) |
| 07.05.2024     | 7:15-7:15   | 41.6        | 21.7         | 8.5         | 26.1        | BDL(DL:5.0) | BDL(DL:1.0) | BDL(DL:1.14) |
| 13.05.2024     | 7:00-7:00   | 40.7        | 21.8         | 7.4         | 25.3        | BDL(DL:5.0) | BDL(DL:1.0) | BDL(DL:1.14) |
| 14.05.2024     | 7:15-7:15   | 41.5        | 22.9         | 8.3         | 26.9        | BDL(DL:5.0) | BDL(DL:1.0) | BDL(DL:1.14) |
| 20.05.2024     | 7:00-7:00   | 42.4        | 21.5         | 8.3         | 27.7        | BDL(DL:5.0) | BDL(DL:1.0) | BDL(DL:1.14) |
| 21.05.2024     | 7:15-7:15   | 42.5        | 22.1         | 7.5         | 28.4        | BDL(DL:5.0) | BDL(DL:1.0) | BDL(DL:1.14) |
| 27.05.2024     | 7:00-7:00   | 41.3        | 21.7         | 7.6         | 26.4        | BDL(DL:5.0) | BDL(DL:1.0) | BDL(DL:1.14) |
| 29.05.2024     | 7:15-7:15   | 41.5        | 21.9         | 7.1         | 26.7        | BDL(DL:5.0) | BDL(DL:1.0) | BDL(DL:1.14) |
| NAAQ* Standard |             | <100        | <100         | <60         | <80         | <80         | <100        | <400         |

Note: BDL: Below Detection Limit ;DL: Detection Limit

Remarks: The values observed for the pollutants given above are within the CPCB standards.

\*\*\*\*\*End of Report\*\*\*\*\*

Page 1 of 1

Verified by



Authorised Signatory

Name: Santhosh Kumar A  
Designation : Quality Manager

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**TEST REPORT**

|                           |   |                         |            |
|---------------------------|---|-------------------------|------------|
| <b>Report No</b>          | EHS360/TR/2022-23/003   | <b>Report Date</b>      | 06.06.2024 |
| <b>Site Location</b>      | <b>THIRU. N.T. SAISADA ROUGH STONE AND GRAVEL QUARRY</b><br>S.F.No.: 151(P) & 152/4, Extent: 2.28.40Ha, Kurumbapalayam Village,<br>Sathiyamangalam Taluk, Erode District. |                         |            |
| <b>Sampling Method</b>    | IS 5182   | <b>Sample Drawn by</b>  | Laboratory |
| <b>Sample Name</b>        | Air   | <b>Sample Code</b>      | EHS360/003 |
| <b>Sample Description</b> | Ambient Air Quality Monitoring  | <b>Sample Condition</b> | Good       |
| <b>Sampling Location</b>  | <b>AAQ3 – Kurumbapalayam - 11°25'21.81"N 77°10'30.46"E</b>  |                         |            |

| Date                  | Period. hrs | SPM (µg/m <sup>3</sup> ) | As (ng/m <sup>3</sup> ) | C6H6 (µg/m <sup>3</sup> ) | BaP (ng/m <sup>3</sup> ) | Pb (µg/m <sup>3</sup> ) | Ni (ng/m <sup>3</sup> ) |
|-----------------------|-------------|--------------------------|-------------------------|---------------------------|--------------------------|-------------------------|-------------------------|
| 04.03.2024            | 7:00-7:00   | 61.9                     | BDL (DL:0.1)            | BDL (DL:1.0)              | BDL (DL:1.0)             | BDL (DL:0.1)            | BDL (DL:0.1)            |
| 05.03.2024            | 7:15-7:15   | 62.9                     | BDL (DL:0.1)            | BDL (DL:1.0)              | BDL (DL:1.0)             | BDL (DL:0.1)            | BDL (DL:0.1)            |
| 11.03.2024            | 7:00-7:00   | 62.5                     | BDL (DL:0.1)            | BDL (DL:1.0)              | BDL (DL:1.0)             | BDL (DL:0.1)            | BDL (DL:0.1)            |
| 12.03.2024            | 7:15-7:15   | 61.8                     | BDL (DL:0.1)            | BDL (DL:1.0)              | BDL (DL:1.0)             | BDL (DL:0.1)            | BDL (DL:0.1)            |
| 18.03.2024            | 7:00-7:00   | 63.3                     | BDL (DL:0.1)            | BDL (DL:1.0)              | BDL (DL:1.0)             | BDL (DL:0.1)            | BDL (DL:0.1)            |
| 19.03.2024            | 7:15-7:15   | 62.7                     | BDL (DL:0.1)            | BDL (DL:1.0)              | BDL (DL:1.0)             | BDL (DL:0.1)            | BDL (DL:0.1)            |
| 25.03.2024            | 7:00-7:00   | 61.9                     | BDL (DL:0.1)            | BDL (DL:1.0)              | BDL (DL:1.0)             | BDL (DL:0.1)            | BDL (DL:0.1)            |
| 26.03.2024            | 7:15-7:15   | 61.5                     | BDL (DL:0.1)            | BDL (DL:1.0)              | BDL (DL:1.0)             | BDL (DL:0.1)            | BDL (DL:0.1)            |
| 01.04.2024            | 7:00-7:00   | 61.6                     | BDL (DL:0.1)            | BDL (DL:1.0)              | BDL (DL:1.0)             | BDL (DL:0.1)            | BDL (DL:0.1)            |
| 02.04.2024            | 7:15-7:15   | 62.9                     | BDL (DL:0.1)            | BDL (DL:1.0)              | BDL (DL:1.0)             | BDL (DL:0.1)            | BDL (DL:0.1)            |
| 08.04.2024            | 7:00-7:00   | 62.3                     | BDL (DL:0.1)            | BDL (DL:1.0)              | BDL (DL:1.0)             | BDL (DL:0.1)            | BDL (DL:0.1)            |
| 09.04.2024            | 7:15-7:15   | 62.9                     | BDL (DL:0.1)            | BDL (DL:1.0)              | BDL (DL:1.0)             | BDL (DL:0.1)            | BDL (DL:0.1)            |
| 15.04.2024            | 7:00-7:00   | 62.7                     | BDL (DL:0.1)            | BDL (DL:1.0)              | BDL (DL:1.0)             | BDL (DL:0.1)            | BDL (DL:0.1)            |
| 16.04.2024            | 7:15-7:15   | 61.9                     | BDL (DL:0.1)            | BDL (DL:1.0)              | BDL (DL:1.0)             | BDL (DL:0.1)            | BDL (DL:0.1)            |
| 22.04.2024            | 7:00-7:00   | 61.5                     | BDL (DL:0.1)            | BDL (DL:1.0)              | BDL (DL:1.0)             | BDL (DL:0.1)            | BDL (DL:0.1)            |
| 23.04.2024            | 7:15-7:15   | 61.8                     | BDL (DL:0.1)            | BDL (DL:1.0)              | BDL (DL:1.0)             | BDL (DL:0.1)            | BDL (DL:0.1)            |
| 29.04.2024            | 7:00-7:00   | 61.3                     | BDL (DL:0.1)            | BDL (DL:1.0)              | BDL (DL:1.0)             | BDL (DL:0.1)            | BDL (DL:0.1)            |
| 30.04.2024            | 7:15-7:15   | 62.9                     | BDL (DL:0.1)            | BDL (DL:1.0)              | BDL (DL:1.0)             | BDL (DL:0.1)            | BDL (DL:0.1)            |
| 06.05.2024            | 7:00-7:00   | 61.9                     | BDL (DL:0.1)            | BDL (DL:1.0)              | BDL (DL:1.0)             | BDL (DL:0.1)            | BDL (DL:0.1)            |
| 07.05.2024            | 7:15-7:15   | 61.5                     | BDL (DL:0.1)            | BDL (DL:1.0)              | BDL (DL:1.0)             | BDL (DL:0.1)            | BDL (DL:0.1)            |
| 13.05.2024            | 7:00-7:00   | 62.7                     | BDL (DL:0.1)            | BDL (DL:1.0)              | BDL (DL:1.0)             | BDL (DL:0.1)            | BDL (DL:0.1)            |
| 14.05.2024            | 7:15-7:15   | 62.9                     | BDL (DL:0.1)            | BDL (DL:1.0)              | BDL (DL:1.0)             | BDL (DL:0.1)            | BDL (DL:0.1)            |
| 20.05.2024            | 7:00-7:00   | 62.5                     | BDL (DL:0.1)            | BDL (DL:1.0)              | BDL (DL:1.0)             | BDL (DL:0.1)            | BDL (DL:0.1)            |
| 21.05.2024            | 7:15-7:15   | 62.4                     | BDL (DL:0.1)            | BDL (DL:1.0)              | BDL (DL:1.0)             | BDL (DL:0.1)            | BDL (DL:0.1)            |
| 27.05.2024            | 7:00-7:00   | 62.7                     | BDL (DL:0.1)            | BDL (DL:1.0)              | BDL (DL:1.0)             | BDL (DL:0.1)            | BDL (DL:0.1)            |
| 29.05.2024            | 7:15-7:15   | 62.3                     | BDL (DL:0.1)            | BDL (DL:1.0)              | BDL (DL:1.0)             | BDL (DL:0.1)            | BDL (DL:0.1)            |
| <b>NAAQ* Standard</b> |             | <200                     | <200                    | <100                      | <60                      | <80                     | <80                     |

**Note:** BDL: Below Detection Limit ;DL: Detection Limit

**Remarks:** The values observed for the pollutants given above are within the CPCB standards.

\*\*\*\*\*End of Report\*\*\*\*\*



Verified by

*[Signature]*

Authorised Signatory

Name: Santhosh Kumar A  
Designation: Quality Manager

- Note: 1. The test results are only to the sample submitted for test. 2. Any correction of the test report in full or part shall invalidate the report. 3. Sample will be retained for 15 days from the date of reporting except in case of regulatory samples or specifically instructed by client. 4. Perishable samples will be discarded immediately after reporting. 5. Under no circumstance's lab accepts any liability or loss/damage caused by use or misuse of test report after invoicing or issued of test report.



**TEST REPORT**

|                           |   |                         |            |
|---------------------------|---|-------------------------|------------|
| <b>Report No</b>          | EHS360/TR/2022-23/004   | <b>Report Date</b>      | 06.06.2024 |
| <b>Site Location</b>      | <b>THIRU. N.T. SAISADA ROUGH STONE AND GRAVEL QUARRY</b><br>S.F.No.: 151(P) & 152/4, Extent: 2.28.40Ha, Kurumbapalayam Village,<br>Sathiyamangalam Taluk, Erode District. |                         |            |
| <b>Sampling Method</b>    | IS 5182   | <b>Sample Drawn by</b>  | Laboratory |
| <b>Sample Name</b>        | Air   | <b>Sample Code</b>      | EHS360/004 |
| <b>Sample Description</b> | Ambient Air Quality Monitoring  | <b>Sample Condition</b> | Good       |
| <b>Sampling Location</b>  | <b>AAQ4 – Thoppampalayam - 11°27'41.22"N 77° 8'46.69"E</b>  |                         |            |

| Date           | Period. hrs | PM10(µg/m3) | PM2.5(µg/m3) | SO2 (µg/m3) | NO2 (µg/m3) | O3 (µg/m3)  | NH3 (µg/m3) | CO (mg/ m3)  |
|----------------|-------------|-------------|--------------|-------------|-------------|-------------|-------------|--------------|
| 04.03.2024     | 7:00-7:00   | 43.5        | 19.2         | 6.2         | 20.6        | BDL(DL:5.0) | BDL(DL:1.0) | BDL(DL:1.14) |
| 05.03.2024     | 7:15-7:15   | 42.1        | 18.5         | 6.0         | 21.2        | BDL(DL:5.0) | BDL(DL:1.0) | BDL(DL:1.14) |
| 11.03.2024     | 7:00-7:00   | 42.9        | 17.2         | 6.9         | 22.5        | BDL(DL:5.0) | BDL(DL:1.0) | BDL(DL:1.14) |
| 12.03.2024     | 7:15-7:15   | 42.5        | 17.9         | 7.5         | 21.5        | BDL(DL:5.0) | BDL(DL:1.0) | BDL(DL:1.14) |
| 18.03.2024     | 7:00-7:00   | 42.1        | 18.3         | 6.1         | 22.8        | BDL(DL:5.0) | BDL(DL:1.0) | BDL(DL:1.14) |
| 19.03.2024     | 7:15-7:15   | 41.6        | 19.1         | 6.9         | 22.1        | BDL(DL:5.0) | BDL(DL:1.0) | BDL(DL:1.14) |
| 25.03.2024     | 7:00-7:00   | 42.1        | 18.6         | 7.3         | 23.1        | BDL(DL:5.0) | BDL(DL:1.0) | BDL(DL:1.14) |
| 26.03.2024     | 7:15-7:15   | 42.8        | 18.1         | 7.1         | 22.5        | BDL(DL:5.0) | BDL(DL:1.0) | BDL(DL:1.14) |
| 01.04.2024     | 7:00-7:00   | 43.6        | 17.9         | 5.6         | 22.0        | BDL(DL:5.0) | BDL(DL:1.0) | BDL(DL:1.14) |
| 02.04.2024     | 7:15-7:15   | 42.5        | 18.3         | 5.8         | 22.5        | BDL(DL:5.0) | BDL(DL:1.0) | BDL(DL:1.14) |
| 08.04.2024     | 7:00-7:00   | 41.1        | 18.6         | 7.2         | 21.8        | BDL(DL:5.0) | BDL(DL:1.0) | BDL(DL:1.14) |
| 09.04.2024     | 7:15-7:15   | 42.5        | 19.2         | 7.9         | 22.1        | BDL(DL:5.0) | BDL(DL:1.0) | BDL(DL:1.14) |
| 15.04.2024     | 7:00-7:00   | 44.2        | 18.9         | 7.5         | 22.8        | BDL(DL:5.0) | BDL(DL:1.0) | BDL(DL:1.14) |
| 16.04.2024     | 7:15-7:15   | 43.6        | 18.2         | 7.1         | 23.7        | BDL(DL:5.0) | BDL(DL:1.0) | BDL(DL:1.14) |
| 22.04.2024     | 7:00-7:00   | 43.1        | 19.5         | 6.9         | 22.4        | BDL(DL:5.0) | BDL(DL:1.0) | BDL(DL:1.14) |
| 23.04.2024     | 7:15-7:15   | 43.5        | 18.7         | 6.5         | 21.4        | BDL(DL:5.0) | BDL(DL:1.0) | BDL(DL:1.14) |
| 29.04.2024     | 7:00-7:00   | 42.1        | 17.9         | 7.2         | 22.8        | BDL(DL:5.0) | BDL(DL:1.0) | BDL(DL:1.14) |
| 30.04.2024     | 7:15-7:15   | 41.9        | 18.3         | 6.8         | 22.4        | BDL(DL:5.0) | BDL(DL:1.0) | BDL(DL:1.14) |
| 06.05.2024     | 7:00-7:00   | 42.5        | 18.9         | 7.3         | 23.1        | BDL(DL:5.0) | BDL(DL:1.0) | BDL(DL:1.14) |
| 07.05.2024     | 7:15-7:15   | 43.9        | 18.2         | 7.1         | 22.8        | BDL(DL:5.0) | BDL(DL:1.0) | BDL(DL:1.14) |
| 13.05.2024     | 7:00-7:00   | 41.8        | 19.6         | 7.5         | 22.4        | BDL(DL:5.0) | BDL(DL:1.0) | BDL(DL:1.14) |
| 14.05.2024     | 7:15-7:15   | 42.5        | 19.1         | 7.2         | 21.9        | BDL(DL:5.0) | BDL(DL:1.0) | BDL(DL:1.14) |
| 20.05.2024     | 7:00-7:00   | 42.2        | 18.9         | 6.9         | 21.1        | BDL(DL:5.0) | BDL(DL:1.0) | BDL(DL:1.14) |
| 21.05.2024     | 7:15-7:15   | 43.9        | 18.5         | 7.2         | 22.5        | BDL(DL:5.0) | BDL(DL:1.0) | BDL(DL:1.14) |
| 27.05.2024     | 7:00-7:00   | 42.3        | 18.9         | 7.4         | 21.9        | BDL(DL:5.0) | BDL(DL:1.0) | BDL(DL:1.14) |
| 29.05.2024     | 7:15-7:15   | 42.1        | 18.1         | 7.6         | 21.4        | BDL(DL:5.0) | BDL(DL:1.0) | BDL(DL:1.14) |
| NAAQ* Standard |             | <100        | <100         | <60         | <80         | <80         | <100        | <400         |

**Note:** BDL: Below Detection Limit ;DL: Detection Limit

**Remarks:** The values observed for the pollutants given above are within the CPCB standards.

\*\*\*\*\*End of Report\*\*\*\*\*



Verified by

Authorised Signatory

Name: Santhosh Kumar A  
Designation: Quality Manager

- Note: 1. The test results are only to the sample submitted for test. 2. Any correction of the test report in full or part shall invalidate the report. 3. Sample will be retained for 15 days from the date of reporting except in case of regulatory samples or specifically instructed by client. 4. Perishable samples will be discarded immediately after reporting. 5. Under no circumstance's lab accepts any liability or loss/damage caused by use or misuse of test report after invoicing or issued of test report.

**TEST REPORT**

|                           |   |                         |            |
|---------------------------|---|-------------------------|------------|
| <b>Report No</b>          | EHS360/TR/2022-23/004   | <b>Report Date</b>      | 06.06.2024 |
| <b>Site Location</b>      | <b>THIRU. N.T. SAISADA ROUGH STONE AND GRAVEL QUARRY</b><br>S.F.No.: 151(P) & 152/4, Extent: 2.28.40Ha, Kurumbapalayam Village,<br>Sathiyamangalam Taluk, Erode District. |                         |            |
| <b>Sampling Method</b>    | IS 5182   | <b>Sample Drawn by</b>  | Laboratory |
| <b>Sample Name</b>        | Air   | <b>Sample Code</b>      | EHS360/004 |
| <b>Sample Description</b> | Ambient Air Quality Monitoring  | <b>Sample Condition</b> | Good       |
| <b>Sampling Location</b>  | <b>AAQ4 – Thoppampalayam - 11°27'41.22"N 77° 8'46.69"E</b>  |                         |            |

| Date                  | Period. hrs | SPM (µg/m³) | As (ng/m³)   | C6H6 (µg/m³) | BaP (ng/m³)  | Pb (µg/m³)   | Ni (ng/m³)   |
|-----------------------|-------------|-------------|--------------|--------------|--------------|--------------|--------------|
| 04.03.2024            | 7:00-7:00   | 60.2        | BDL (DL:0.1) | BDL (DL:1.0) | BDL (DL:1.0) | BDL (DL:0.1) | BDL (DL:0.1) |
| 05.03.2024            | 7:15-7:15   | 60.8        | BDL (DL:0.1) | BDL (DL:1.0) | BDL (DL:1.0) | BDL (DL:0.1) | BDL (DL:0.1) |
| 11.03.2024            | 7:00-7:00   | 61.5        | BDL (DL:0.1) | BDL (DL:1.0) | BDL (DL:1.0) | BDL (DL:0.1) | BDL (DL:0.1) |
| 12.03.2024            | 7:15-7:15   | 61.9        | BDL (DL:0.1) | BDL (DL:1.0) | BDL (DL:1.0) | BDL (DL:0.1) | BDL (DL:0.1) |
| 18.03.2024            | 7:00-7:00   | 61.7        | BDL (DL:0.1) | BDL (DL:1.0) | BDL (DL:1.0) | BDL (DL:0.1) | BDL (DL:0.1) |
| 19.03.2024            | 7:15-7:15   | 62.9        | BDL (DL:0.1) | BDL (DL:1.0) | BDL (DL:1.0) | BDL (DL:0.1) | BDL (DL:0.1) |
| 25.03.2024            | 7:00-7:00   | 62.5        | BDL (DL:0.1) | BDL (DL:1.0) | BDL (DL:1.0) | BDL (DL:0.1) | BDL (DL:0.1) |
| 26.03.2024            | 7:15-7:15   | 61.3        | BDL (DL:0.1) | BDL (DL:1.0) | BDL (DL:1.0) | BDL (DL:0.1) | BDL (DL:0.1) |
| 01.04.2024            | 7:00-7:00   | 61.7        | BDL (DL:0.1) | BDL (DL:1.0) | BDL (DL:1.0) | BDL (DL:0.1) | BDL (DL:0.1) |
| 02.04.2024            | 7:15-7:15   | 64.2        | BDL (DL:0.1) | BDL (DL:1.0) | BDL (DL:1.0) | BDL (DL:0.1) | BDL (DL:0.1) |
| 08.04.2024            | 7:00-7:00   | 60.6        | BDL (DL:0.1) | BDL (DL:1.0) | BDL (DL:1.0) | BDL (DL:0.1) | BDL (DL:0.1) |
| 09.04.2024            | 7:15-7:15   | 60.9        | BDL (DL:0.1) | BDL (DL:1.0) | BDL (DL:1.0) | BDL (DL:0.1) | BDL (DL:0.1) |
| 15.04.2024            | 7:00-7:00   | 61.4        | BDL (DL:0.1) | BDL (DL:1.0) | BDL (DL:1.0) | BDL (DL:0.1) | BDL (DL:0.1) |
| 16.04.2024            | 7:15-7:15   | 61.8        | BDL (DL:0.1) | BDL (DL:1.0) | BDL (DL:1.0) | BDL (DL:0.1) | BDL (DL:0.1) |
| 22.04.2024            | 7:00-7:00   | 61.3        | BDL (DL:0.1) | BDL (DL:1.0) | BDL (DL:1.0) | BDL (DL:0.1) | BDL (DL:0.1) |
| 23.04.2024            | 7:15-7:15   | 62.5        | BDL (DL:0.1) | BDL (DL:1.0) | BDL (DL:1.0) | BDL (DL:0.1) | BDL (DL:0.1) |
| 29.04.2024            | 7:00-7:00   | 63.5        | BDL (DL:0.1) | BDL (DL:1.0) | BDL (DL:1.0) | BDL (DL:0.1) | BDL (DL:0.1) |
| 30.04.2024            | 7:15-7:15   | 63.7        | BDL (DL:0.1) | BDL (DL:1.0) | BDL (DL:1.0) | BDL (DL:0.1) | BDL (DL:0.1) |
| 06.05.2024            | 7:00-7:00   | 64.5        | BDL (DL:0.1) | BDL (DL:1.0) | BDL (DL:1.0) | BDL (DL:0.1) | BDL (DL:0.1) |
| 07.05.2024            | 7:15-7:15   | 62.2        | BDL (DL:0.1) | BDL (DL:1.0) | BDL (DL:1.0) | BDL (DL:0.1) | BDL (DL:0.1) |
| 13.05.2024            | 7:00-7:00   | 62.8        | BDL (DL:0.1) | BDL (DL:1.0) | BDL (DL:1.0) | BDL (DL:0.1) | BDL (DL:0.1) |
| 14.05.2024            | 7:15-7:15   | 64.5        | BDL (DL:0.1) | BDL (DL:1.0) | BDL (DL:1.0) | BDL (DL:0.1) | BDL (DL:0.1) |
| 20.05.2024            | 7:00-7:00   | 65.3        | BDL (DL:0.1) | BDL (DL:1.0) | BDL (DL:1.0) | BDL (DL:0.1) | BDL (DL:0.1) |
| 21.05.2024            | 7:15-7:15   | 63.5        | BDL (DL:0.1) | BDL (DL:1.0) | BDL (DL:1.0) | BDL (DL:0.1) | BDL (DL:0.1) |
| 27.05.2024            | 7:00-7:00   | 65.5        | BDL (DL:0.1) | BDL (DL:1.0) | BDL (DL:1.0) | BDL (DL:0.1) | BDL (DL:0.1) |
| 29.05.2024            | 7:15-7:15   | 65.9        | BDL (DL:0.1) | BDL (DL:1.0) | BDL (DL:1.0) | BDL (DL:0.1) | BDL (DL:0.1) |
| <b>NAAQ* Standard</b> |             | <200        | <200         | <100         | <60          | <80          | <80          |

**Note:** BDL: Below Detection Limit ;DL: Detection Limit

**Remarks:** The values observed for the pollutants given above are within the CPCB standards.

\*\*\*\*\*End of Report\*\*\*\*\*



Verified by

*[Signature]*

Authorised Signatory

*[Signature]*  
Name: Santhosh Kumar A  
Designation: Quality Manager

- Note: 1. The test results are only to the sample submitted for test. 2. Any correction of the test report in full or part shall invalidate the report. 3. Sample will be retained for 15 days from the date of reporting except in case of regulatory samples or specifically instructed by client. 4. Perishable samples will be discarded immediately after reporting. 5. Under no circumstance's lab accepts any liability or loss/damage caused by use or misuse of test report after invoicing or issued of test report.

**TEST REPORT**

|                           |   |                         |            |
|---------------------------|---|-------------------------|------------|
| <b>Report No</b>          | EHS360/TR/2022-23/005   | <b>Report Date</b>      | 06.06.2024 |
| <b>Site Location</b>      | <b>THIRU. N.T. SAISADA ROUGH STONE AND GRAVEL QUARRY</b><br>S.F.No.: 151(P) & 152/4, Extent: 2.28.40Ha, Kurumbapalayam Village,<br>Sathiyamangalam Taluk, Erode District. |                         |            |
| <b>Sampling Method</b>    | IS 5182   | <b>Sample Drawn by</b>  | Laboratory |
| <b>Sample Name</b>        | Air   | <b>Sample Code</b>      | EHS360/005 |
| <b>Sample Description</b> | Ambient Air Quality Monitoring  | <b>Sample Condition</b> | Good       |
| <b>Sampling Location</b>  | <b>AAQ5 – Mayilampatti - 11°23'39.42"N 77° 8'9.34"E</b>   |                         |            |

| Date                  | Period. hrs | PM10(µg/m3) | PM2.5(µg/m3) | SO2 (µg/m3) | NO2 (µg/m3) | O3 (µg/m3)  | NH3 (µg/m3) | CO (mg/ m3)  |
|-----------------------|-------------|-------------|--------------|-------------|-------------|-------------|-------------|--------------|
| 04.03.2024            | 7:00-7:00   | 43.2        | 21.2         | 6.3         | 21.9        | BDL(DL:5.0) | BDL(DL:1.0) | BDL(DL:1.14) |
| 05.03.2024            | 7:15-7:15   | 42.5        | 21.9         | 5.9         | 22.7        | BDL(DL:5.0) | BDL(DL:1.0) | BDL(DL:1.14) |
| 11.03.2024            | 7:00-7:00   | 43.9        | 21.5         | 5.4         | 23.4        | BDL(DL:5.0) | BDL(DL:1.0) | BDL(DL:1.14) |
| 12.03.2024            | 7:15-7:15   | 41.5        | 21.7         | 7.8         | 22.9        | BDL(DL:5.0) | BDL(DL:1.0) | BDL(DL:1.14) |
| 18.03.2024            | 7:00-7:00   | 42.7        | 22.4         | 5.9         | 23.6        | BDL(DL:5.0) | BDL(DL:1.0) | BDL(DL:1.14) |
| 19.03.2024            | 7:15-7:15   | 43.3        | 22.6         | 5.8         | 22.3        | BDL(DL:5.0) | BDL(DL:1.0) | BDL(DL:1.14) |
| 25.03.2024            | 7:00-7:00   | 44.5        | 22.9         | 5.1         | 25.9        | BDL(DL:5.0) | BDL(DL:1.0) | BDL(DL:1.14) |
| 26.03.2024            | 7:15-7:15   | 42.7        | 21.4         | 7.3         | 24.4        | BDL(DL:5.0) | BDL(DL:1.0) | BDL(DL:1.14) |
| 01.04.2024            | 7:00-7:00   | 43.4        | 22.1         | 6.3         | 23.9        | BDL(DL:5.0) | BDL(DL:1.0) | BDL(DL:1.14) |
| 02.04.2024            | 7:15-7:15   | 42.9        | 21.7         | 5.8         | 25.7        | BDL(DL:5.0) | BDL(DL:1.0) | BDL(DL:1.14) |
| 08.04.2024            | 7:00-7:00   | 44.6        | 22.9         | 7.9         | 24.3        | BDL(DL:5.0) | BDL(DL:1.0) | BDL(DL:1.14) |
| 09.04.2024            | 7:15-7:15   | 42.5        | 21.4         | 6.3         | 23.9        | BDL(DL:5.0) | BDL(DL:1.0) | BDL(DL:1.14) |
| 15.04.2024            | 7:00-7:00   | 44.7        | 21.7         | 8.5         | 25.7        | BDL(DL:5.0) | BDL(DL:1.0) | BDL(DL:1.14) |
| 16.04.2024            | 7:15-7:15   | 43.3        | 22.8         | 5.9         | 24.4        | BDL(DL:5.0) | BDL(DL:1.0) | BDL(DL:1.14) |
| 22.04.2024            | 7:00-7:00   | 42.5        | 22.6         | 6.9         | 23.3        | BDL(DL:5.0) | BDL(DL:1.0) | BDL(DL:1.14) |
| 23.04.2024            | 7:15-7:15   | 41.8        | 22.3         | 8.7         | 25.7        | BDL(DL:5.0) | BDL(DL:1.0) | BDL(DL:1.14) |
| 29.04.2024            | 7:00-7:00   | 42.7        | 22.9         | 5.3         | 26.6        | BDL(DL:5.0) | BDL(DL:1.0) | BDL(DL:1.14) |
| 30.04.2024            | 7:15-7:15   | 42.5        | 21.7         | 6.9         | 25.8        | BDL(DL:5.0) | BDL(DL:1.0) | BDL(DL:1.14) |
| 06.05.2024            | 7:00-7:00   | 43.6        | 22.2         | 5.8         | 24.3        | BDL(DL:5.0) | BDL(DL:1.0) | BDL(DL:1.14) |
| 07.05.2024            | 7:15-7:15   | 42.5        | 21.3         | 6.3         | 25.7        | BDL(DL:5.0) | BDL(DL:1.0) | BDL(DL:1.14) |
| 13.05.2024            | 7:00-7:00   | 44.9        | 23.4         | 5.9         | 24.4        | BDL(DL:5.0) | BDL(DL:1.0) | BDL(DL:1.14) |
| 14.05.2024            | 7:15-7:15   | 44.1        | 22.9         | 7.4         | 23.9        | BDL(DL:5.0) | BDL(DL:1.0) | BDL(DL:1.14) |
| 20.05.2024            | 7:00-7:00   | 43.7        | 22.2         | 6.2         | 22.3        | BDL(DL:5.0) | BDL(DL:1.0) | BDL(DL:1.14) |
| 21.05.2024            | 7:15-7:15   | 43.5        | 21.5         | 5.6         | 22.7        | BDL(DL:5.0) | BDL(DL:1.0) | BDL(DL:1.14) |
| 27.05.2024            | 7:00-7:00   | 42.2        | 21.8         | 7.2         | 22.3        | BDL(DL:5.0) | BDL(DL:1.0) | BDL(DL:1.14) |
| 29.05.2024            | 7:15-7:15   | 42.9        | 21.7         | 6.9         | 23.5        | BDL(DL:5.0) | BDL(DL:1.0) | BDL(DL:1.14) |
| <b>NAAQ* Standard</b> |             | <100        | <100         | <60         | <805        | <80         | <100        | <400         |

**Note:** BDL: Below Detection Limit ;DL: Detection Limit

**Remarks:** The values observed for the pollutants given above are within the CPCB standards.

\*\*\*\*\*End of Report\*\*\*\*\*



Verified by

Authorised Signatory

Name: Santhosh Kumar A  
Designation: Quality Manager

- Note: 1. The test results are only to the sample submitted for test. 2. Any correction of the test report in full or part shall invalidate the report. 3. Sample will be retained for 15 days from the date of reporting except in case of regulatory samples or specifically instructed by client. 4. Perishable samples will be discarded immediately after reporting. 5. Under no circumstance's lab accepts any liability or loss/damage caused by use or misuse of test report after invoicing or issued of test report.

**TEST REPORT**

|                           |   |                         |            |
|---------------------------|---|-------------------------|------------|
| <b>Report No</b>          | EHS360/TR/2022-23/005   | <b>Report Date</b>      | 06.06.2024 |
| <b>Site Location</b>      | <b>THIRU. N.T. SAISADA ROUGH STONE AND GRAVEL QUARRY</b><br>S.F.No.: 151(P) & 152/4, Extent: 2.28.40Ha, Kurumbapalayam Village,<br>Sathiyamangalam Taluk, Erode District. |                         |            |
| <b>Sampling Method</b>    | IS 5182   | <b>Sample Drawn by</b>  | Laboratory |
| <b>Sample Name</b>        | Air   | <b>Sample Code</b>      | EHS360/005 |
| <b>Sample Description</b> | Ambient Air Quality Monitoring  | <b>Sample Condition</b> | Good       |
| <b>Sampling Location</b>  | <b>AAQ5 – Mayilampatti - 11°23'39.42"N 77° 8'9.34"E</b>   |                         |            |

| Date                  | Period. hrs | SPM (µg/m <sup>3</sup> ) | As (ng/m <sup>3</sup> ) | C6H6 (µg/m <sup>3</sup> ) | BaP (ng/m <sup>3</sup> ) | Pb (µg/m <sup>3</sup> ) | Ni (ng/m <sup>3</sup> ) |
|-----------------------|-------------|--------------------------|-------------------------|---------------------------|--------------------------|-------------------------|-------------------------|
| 04.03.2024            | 7:00-7:00   | 63.7                     | BDL (DL:0.1)            | BDL (DL:1.0)              | BDL (DL:1.0)             | BDL (DL:0.1)            | BDL (DL:0.1)            |
| 05.03.2024            | 7:15-7:15   | 61.8                     | BDL (DL:0.1)            | BDL (DL:1.0)              | BDL (DL:1.0)             | BDL (DL:0.1)            | BDL (DL:0.1)            |
| 11.03.2024            | 7:00-7:00   | 62.6                     | BDL (DL:0.1)            | BDL (DL:1.0)              | BDL (DL:1.0)             | BDL (DL:0.1)            | BDL (DL:0.1)            |
| 12.03.2024            | 7:15-7:15   | 63.4                     | BDL (DL:0.1)            | BDL (DL:1.0)              | BDL (DL:1.0)             | BDL (DL:0.1)            | BDL (DL:0.1)            |
| 18.03.2024            | 7:00-7:00   | 62.5                     | BDL (DL:0.1)            | BDL (DL:1.0)              | BDL (DL:1.0)             | BDL (DL:0.1)            | BDL (DL:0.1)            |
| 19.03.2024            | 7:15-7:15   | 63.9                     | BDL (DL:0.1)            | BDL (DL:1.0)              | BDL (DL:1.0)             | BDL (DL:0.1)            | BDL (DL:0.1)            |
| 25.03.2024            | 7:00-7:00   | 62.5                     | BDL (DL:0.1)            | BDL (DL:1.0)              | BDL (DL:1.0)             | BDL (DL:0.1)            | BDL (DL:0.1)            |
| 26.03.2024            | 7:15-7:15   | 63.3                     | BDL (DL:0.1)            | BDL (DL:1.0)              | BDL (DL:1.0)             | BDL (DL:0.1)            | BDL (DL:0.1)            |
| 01.04.2024            | 7:00-7:00   | 65.4                     | BDL (DL:0.1)            | BDL (DL:1.0)              | BDL (DL:1.0)             | BDL (DL:0.1)            | BDL (DL:0.1)            |
| 02.04.2024            | 7:15-7:15   | 61.8                     | BDL (DL:0.1)            | BDL (DL:1.0)              | BDL (DL:1.0)             | BDL (DL:0.1)            | BDL (DL:0.1)            |
| 08.04.2024            | 7:00-7:00   | 62.2                     | BDL (DL:0.1)            | BDL (DL:1.0)              | BDL (DL:1.0)             | BDL (DL:0.1)            | BDL (DL:0.1)            |
| 09.04.2024            | 7:15-7:15   | 63.9                     | BDL (DL:0.1)            | BDL (DL:1.0)              | BDL (DL:1.0)             | BDL (DL:0.1)            | BDL (DL:0.1)            |
| 15.04.2024            | 7:00-7:00   | 62.7                     | BDL (DL:0.1)            | BDL (DL:1.0)              | BDL (DL:1.0)             | BDL (DL:0.1)            | BDL (DL:0.1)            |
| 16.04.2024            | 7:15-7:15   | 62.5                     | BDL (DL:0.1)            | BDL (DL:1.0)              | BDL (DL:1.0)             | BDL (DL:0.1)            | BDL (DL:0.1)            |
| 22.04.2024            | 7:00-7:00   | 63.4                     | BDL (DL:0.1)            | BDL (DL:1.0)              | BDL (DL:1.0)             | BDL (DL:0.1)            | BDL (DL:0.1)            |
| 23.04.2024            | 7:15-7:15   | 62.8                     | BDL (DL:0.1)            | BDL (DL:1.0)              | BDL (DL:1.0)             | BDL (DL:0.1)            | BDL (DL:0.1)            |
| 29.04.2024            | 7:00-7:00   | 64.3                     | BDL (DL:0.1)            | BDL (DL:1.0)              | BDL (DL:1.0)             | BDL (DL:0.1)            | BDL (DL:0.1)            |
| 30.04.2024            | 7:15-7:15   | 64.1                     | BDL (DL:0.1)            | BDL (DL:1.0)              | BDL (DL:1.0)             | BDL (DL:0.1)            | BDL (DL:0.1)            |
| 06.05.2024            | 7:00-7:00   | 62.9                     | BDL (DL:0.1)            | BDL (DL:1.0)              | BDL (DL:1.0)             | BDL (DL:0.1)            | BDL (DL:0.1)            |
| 07.05.2024            | 7:15-7:15   | 63.7                     | BDL (DL:0.1)            | BDL (DL:1.0)              | BDL (DL:1.0)             | BDL (DL:0.1)            | BDL (DL:0.1)            |
| 13.05.2024            | 7:00-7:00   | 65.3                     | BDL (DL:0.1)            | BDL (DL:1.0)              | BDL (DL:1.0)             | BDL (DL:0.1)            | BDL (DL:0.1)            |
| 14.05.2024            | 7:15-7:15   | 64.8                     | BDL (DL:0.1)            | BDL (DL:1.0)              | BDL (DL:1.0)             | BDL (DL:0.1)            | BDL (DL:0.1)            |
| 20.05.2024            | 7:00-7:00   | 63.5                     | BDL (DL:0.1)            | BDL (DL:1.0)              | BDL (DL:1.0)             | BDL (DL:0.1)            | BDL (DL:0.1)            |
| 21.05.2024            | 7:15-7:15   | 62.5                     | BDL (DL:0.1)            | BDL (DL:1.0)              | BDL (DL:1.0)             | BDL (DL:0.1)            | BDL (DL:0.1)            |
| 27.05.2024            | 7:00-7:00   | 64.4                     | BDL (DL:0.1)            | BDL (DL:1.0)              | BDL (DL:1.0)             | BDL (DL:0.1)            | BDL (DL:0.1)            |
| 29.05.2024            | 7:15-7:15   | 63.8                     | BDL (DL:0.1)            | BDL (DL:1.0)              | BDL (DL:1.0)             | BDL (DL:0.1)            | BDL (DL:0.1)            |
| <b>NAAQ* Standard</b> |             | <200                     | <200                    | <100                      | <60                      | <80                     | <80                     |

**Note:** BDL: Below Detection Limit ;DL: Detection Limit  
**Remarks:** The values observed for the pollutants given above are within the CPCB standards.

\*\*\*\*\*End of Report\*\*\*\*\*



Verified by

*[Signature]*

Authorised Signatory

*[Signature]*  
Name: Santhosh Kumar A  
Designation : Quality Manager

- Note: 1. The test results are only to the sample submitted for test. 2. Any correction of the test report in full or part shall invalidate the report. 3. Sample will be retained for 15 days from the date of reporting except in case of regulatory samples or specifically instructed by client. 4. Perishable samples will be discarded immediately after reporting. 5. Under no circumstance's lab accepts any liability or loss/damage caused by use or misuse of test report after invoicing or issued of test report.

**TEST REPORT**

|                           |   |                         |            |
|---------------------------|---|-------------------------|------------|
| <b>Report No</b>          | EHS360/TR/2022-23/006   | <b>Report Date</b>      | 06.06.2024 |
| <b>Site Location</b>      | <b>THIRU. N.T. SAISADA ROUGH STONE AND GRAVEL QUARRY</b><br>S.F.No.: 151(P) & 152/4, Extent: 2.28.40Ha, Kurumbapalayam Village,<br>Sathiyamangalam Taluk, Erode District. |                         |            |
| <b>Sampling Method</b>    | IS 5182   | <b>Sample Drawn by</b>  | Laboratory |
| <b>Sample Name</b>        | Air   | <b>Sample Code</b>      | EHS360/006 |
| <b>Sample Description</b> | Ambient Air Quality Monitoring  | <b>Sample Condition</b> | Good       |
| <b>Sampling Location</b>  | <b>AAQ 6 – Shenbagapudur 11°27'47.99"N 77°12'54.44"E</b>  |                         |            |

| Date           | Period. hrs | PM10(µg/m3) | PM2.5(µg/m3) | SO2 (µg/m3) | NO2 (µg/m3) | O3 (µg/m3)  | NH3 (µg/m3) | CO (mg/ m3)  |
|----------------|-------------|-------------|--------------|-------------|-------------|-------------|-------------|--------------|
| 04.03.2024     | 7:00-7:00   | 43.4        | 21.2         | 7.5         | 23.6        | BDL(DL:5.0) | BDL(DL:1.0) | BDL(DL:1.14) |
| 05.03.2024     | 7:15-7:15   | 42.6        | 20.3         | 6.4         | 24.1        | BDL(DL:5.0) | BDL(DL:1.0) | BDL(DL:1.14) |
| 11.03.2024     | 7:00-7:00   | 41.8        | 21.7         | 6.6         | 23.5        | BDL(DL:5.0) | BDL(DL:1.0) | BDL(DL:1.14) |
| 12.03.2024     | 7:15-7:15   | 42.5        | 22.4         | 5.5         | 22.6        | BDL(DL:5.0) | BDL(DL:1.0) | BDL(DL:1.14) |
| 18.03.2024     | 7:00-7:00   | 43.9        | 21.9         | 7.6         | 23.7        | BDL(DL:5.0) | BDL(DL:1.0) | BDL(DL:1.14) |
| 19.03.2024     | 7:15-7:15   | 43.7        | 23.6         | 8.2         | 24.4        | BDL(DL:5.0) | BDL(DL:1.0) | BDL(DL:1.14) |
| 25.03.2024     | 7:00-7:00   | 41.4        | 20.5         | 6.1         | 23.6        | BDL(DL:5.0) | BDL(DL:1.0) | BDL(DL:1.14) |
| 26.03.2024     | 7:15-7:15   | 42.5        | 21.2         | 7.6         | 21.9        | BDL(DL:5.0) | BDL(DL:1.0) | BDL(DL:1.14) |
| 01.04.2024     | 7:00-7:00   | 43.4        | 21.7         | 7.4         | 24.4        | BDL(DL:5.0) | BDL(DL:1.0) | BDL(DL:1.14) |
| 02.04.2024     | 7:15-7:15   | 42.7        | 22.4         | 7.9         | 22.8        | BDL(DL:5.0) | BDL(DL:1.0) | BDL(DL:1.14) |
| 08.04.2024     | 7:00-7:00   | 41.8        | 21.9         | 6.2         | 23.6        | BDL(DL:5.0) | BDL(DL:1.0) | BDL(DL:1.14) |
| 09.04.2024     | 7:15-7:15   | 42.9        | 21.8         | 8.3         | 23.5        | BDL(DL:5.0) | BDL(DL:1.0) | BDL(DL:1.14) |
| 15.04.2024     | 7:00-7:00   | 41.6        | 21.5         | 6.6         | 25.4        | BDL(DL:5.0) | BDL(DL:1.0) | BDL(DL:1.14) |
| 16.04.2024     | 7:15-7:15   | 43.4        | 21.6         | 7.1         | 23.7        | BDL(DL:5.0) | BDL(DL:1.0) | BDL(DL:1.14) |
| 22.04.2024     | 7:00-7:00   | 42.8        | 21.2         | 7.8         | 22.8        | BDL(DL:5.0) | BDL(DL:1.0) | BDL(DL:1.14) |
| 23.04.2024     | 7:15-7:15   | 42.6        | 20.8         | 7.6         | 23.6        | BDL(DL:5.0) | BDL(DL:1.0) | BDL(DL:1.14) |
| 29.04.2024     | 7:00-7:00   | 43.5        | 21.8         | 7.6         | 24.4        | BDL(DL:5.0) | BDL(DL:1.0) | BDL(DL:1.14) |
| 30.04.2024     | 7:15-7:15   | 41.7        | 22.1         | 6.8         | 23.5        | BDL(DL:5.0) | BDL(DL:1.0) | BDL(DL:1.14) |
| 06.05.2024     | 7:00-7:00   | 42.9        | 23.6         | 6.4         | 22.9        | BDL(DL:5.0) | BDL(DL:1.0) | BDL(DL:1.14) |
| 07.05.2024     | 7:15-7:15   | 43.2        | 22.7         | 7.2         | 24.4        | BDL(DL:5.0) | BDL(DL:1.0) | BDL(DL:1.14) |
| 13.05.2024     | 7:00-7:00   | 41.6        | 21.5         | 6.5         | 23.6        | BDL(DL:5.0) | BDL(DL:1.0) | BDL(DL:1.14) |
| 14.05.2024     | 7:15-7:15   | 42.7        | 22.8         | 5.3         | 22.7        | BDL(DL:5.0) | BDL(DL:1.0) | BDL(DL:1.14) |
| 20.05.2024     | 7:00-7:00   | 41.3        | 21.4         | 7.2         | 24.4        | BDL(DL:5.0) | BDL(DL:1.0) | BDL(DL:1.14) |
| 21.05.2024     | 7:15-7:15   | 42.8        | 23.6         | 7.9         | 23.8        | BDL(DL:5.0) | BDL(DL:1.0) | BDL(DL:1.14) |
| 27.05.2024     | 7:00-7:00   | 42.5        | 21.1         | 7.7         | 22.8        | BDL(DL:5.0) | BDL(DL:1.0) | BDL(DL:1.14) |
| 29.05.2024     | 7:15-7:15   | 41.9        | 22.5         | 7.4         | 22.6        | BDL(DL:5.0) | BDL(DL:1.0) | BDL(DL:1.14) |
| NAAQ* Standard |             | <100        | <100         | <60         | <80         | <80         | <100        | <400         |

**Note:** BDL: Below Detection Limit ; DL: Detection Limit

**Remarks:** The values observed for the pollutants given above are within the CPCB standards.

\*\*\*\*\*End of Report\*\*\*\*\*

Page 1 of 1

Verified by



Authorised Signatory

Name: Santhosh Kumar A  
Designation: Quality Manager

- Note: 1. The test results are only to the sample submitted for test. 2. Any correction of the test report in full or part shall invalidate the report. 3. Sample will be retained for 15 days from the date of reporting except in case of regulatory samples or specifically instructed by client. 4. Perishable samples will be discarded immediately after reporting. 5. Under no circumstance's lab accepts any liability or loss/damage caused by use or misuse of test report after invoicing or issued of test report.

## TEST REPORT

|                           |   |                         |            |
|---------------------------|---|-------------------------|------------|
| <b>Report No</b>          | EHS360/TR/2022-23/006   | <b>Report Date</b>      | 06.06.2024 |
| <b>Site Location</b>      | <b>THIRU. N.T. SAISADA ROUGH STONE AND GRAVEL QUARRY</b><br>S.F.No.: 151(P) & 152/4, Extent: 2.28.40Ha, Kurumbapalayam Village,<br>Sathiyamangalam Taluk, Erode District. |                         |            |
| <b>Sampling Method</b>    | IS 5182   | <b>Sample Drawn by</b>  | Laboratory |
| <b>Sample Name</b>        | Air   | <b>Sample Code</b>      | EHS360/006 |
| <b>Sample Description</b> | Ambient Air Quality Monitoring  | <b>Sample Condition</b> | Good       |
| <b>Sampling Location</b>  | <b>AAQ 6 – Shenbagapudur 11°27'47.99"N 77°12'54.44"E</b>  |                         |            |

| Date                  | Period. hrs | SPM (µg/m <sup>3</sup> ) | As (ng/m <sup>3</sup> ) | C6H6 (µg/m <sup>3</sup> ) | BaP (ng/m <sup>3</sup> ) | Pb (µg/m <sup>3</sup> ) | Ni (ng/m <sup>3</sup> ) |
|-----------------------|-------------|--------------------------|-------------------------|---------------------------|--------------------------|-------------------------|-------------------------|
| 04.03.2024            | 7:00-7:00   | 63.2                     | BDL (DL:0.1)            | BDL (DL:1.0)              | BDL (DL:1.0)             | BDL (DL:0.1)            | BDL (DL:0.1)            |
| 05.03.2024            | 7:15-7:15   | 61.9                     | BDL (DL:0.1)            | BDL (DL:1.0)              | BDL (DL:1.0)             | BDL (DL:0.1)            | BDL (DL:0.1)            |
| 11.03.2024            | 7:00-7:00   | 62.4                     | BDL (DL:0.1)            | BDL (DL:1.0)              | BDL (DL:1.0)             | BDL (DL:0.1)            | BDL (DL:0.1)            |
| 12.03.2024            | 7:15-7:15   | 63.6                     | BDL (DL:0.1)            | BDL (DL:1.0)              | BDL (DL:1.0)             | BDL (DL:0.1)            | BDL (DL:0.1)            |
| 18.03.2024            | 7:00-7:00   | 62.7                     | BDL (DL:0.1)            | BDL (DL:1.0)              | BDL (DL:1.0)             | BDL (DL:0.1)            | BDL (DL:0.1)            |
| 19.03.2024            | 7:15-7:15   | 61.6                     | BDL (DL:0.1)            | BDL (DL:1.0)              | BDL (DL:1.0)             | BDL (DL:0.1)            | BDL (DL:0.1)            |
| 25.03.2024            | 7:00-7:00   | 62.5                     | BDL (DL:0.1)            | BDL (DL:1.0)              | BDL (DL:1.0)             | BDL (DL:0.1)            | BDL (DL:0.1)            |
| 26.03.2024            | 7:15-7:15   | 61.9                     | BDL (DL:0.1)            | BDL (DL:1.0)              | BDL (DL:1.0)             | BDL (DL:0.1)            | BDL (DL:0.1)            |
| 01.04.2024            | 7:00-7:00   | 64.4                     | BDL (DL:0.1)            | BDL (DL:1.0)              | BDL (DL:1.0)             | BDL (DL:0.1)            | BDL (DL:0.1)            |
| 02.04.2024            | 7:15-7:15   | 62.3                     | BDL (DL:0.1)            | BDL (DL:1.0)              | BDL (DL:1.0)             | BDL (DL:0.1)            | BDL (DL:0.1)            |
| 08.04.2024            | 7:00-7:00   | 62.8                     | BDL (DL:0.1)            | BDL (DL:1.0)              | BDL (DL:1.0)             | BDL (DL:0.1)            | BDL (DL:0.1)            |
| 09.04.2024            | 7:15-7:15   | 63.5                     | BDL (DL:0.1)            | BDL (DL:1.0)              | BDL (DL:1.0)             | BDL (DL:0.1)            | BDL (DL:0.1)            |
| 15.04.2024            | 7:00-7:00   | 62.9                     | BDL (DL:0.1)            | BDL (DL:1.0)              | BDL (DL:1.0)             | BDL (DL:0.1)            | BDL (DL:0.1)            |
| 16.04.2024            | 7:15-7:15   | 62.4                     | BDL (DL:0.1)            | BDL (DL:1.0)              | BDL (DL:1.0)             | BDL (DL:0.1)            | BDL (DL:0.1)            |
| 22.04.2024            | 7:00-7:00   | 65.5                     | BDL (DL:0.1)            | BDL (DL:1.0)              | BDL (DL:1.0)             | BDL (DL:0.1)            | BDL (DL:0.1)            |
| 23.04.2024            | 7:15-7:15   | 62.9                     | BDL (DL:0.1)            | BDL (DL:1.0)              | BDL (DL:1.0)             | BDL (DL:0.1)            | BDL (DL:0.1)            |
| 29.04.2024            | 7:00-7:00   | 63.7                     | BDL (DL:0.1)            | BDL (DL:1.0)              | BDL (DL:1.0)             | BDL (DL:0.1)            | BDL (DL:0.1)            |
| 30.04.2024            | 7:15-7:15   | 62.4                     | BDL (DL:0.1)            | BDL (DL:1.0)              | BDL (DL:1.0)             | BDL (DL:0.1)            | BDL (DL:0.1)            |
| 06.05.2024            | 7:00-7:00   | 62.3                     | BDL (DL:0.1)            | BDL (DL:1.0)              | BDL (DL:1.0)             | BDL (DL:0.1)            | BDL (DL:0.1)            |
| 07.05.2024            | 7:15-7:15   | 62.8                     | BDL (DL:0.1)            | BDL (DL:1.0)              | BDL (DL:1.0)             | BDL (DL:0.1)            | BDL (DL:0.1)            |
| 13.05.2024            | 7:00-7:00   | 63.7                     | BDL (DL:0.1)            | BDL (DL:1.0)              | BDL (DL:1.0)             | BDL (DL:0.1)            | BDL (DL:0.1)            |
| 14.05.2024            | 7:15-7:15   | 62.5                     | BDL (DL:0.1)            | BDL (DL:1.0)              | BDL (DL:1.0)             | BDL (DL:0.1)            | BDL (DL:0.1)            |
| 20.05.2024            | 7:00-7:00   | 62.6                     | BDL (DL:0.1)            | BDL (DL:1.0)              | BDL (DL:1.0)             | BDL (DL:0.1)            | BDL (DL:0.1)            |
| 21.05.2024            | 7:15-7:15   | 62.1                     | BDL (DL:0.1)            | BDL (DL:1.0)              | BDL (DL:1.0)             | BDL (DL:0.1)            | BDL (DL:0.1)            |
| 27.05.2024            | 7:00-7:00   | 62.8                     | BDL (DL:0.1)            | BDL (DL:1.0)              | BDL (DL:1.0)             | BDL (DL:0.1)            | BDL (DL:0.1)            |
| 29.05.2024            | 7:15-7:15   | 62.7                     | BDL (DL:0.1)            | BDL (DL:1.0)              | BDL (DL:1.0)             | BDL (DL:0.1)            | BDL (DL:0.1)            |
| <b>NAAQ* Standard</b> |             | <200                     | <200                    | <100                      | <60                      | <80                     | <80                     |

**Note:** BDL: Below Detection Limit ;DL: Detection Limit

**Remarks:** The values observed for the pollutants given above are within the CPCB standards.

\*\*\*\*\*End of Report\*\*\*\*\*



Verified by

Authorised Signatory

Name: **Santhosh Kumar A**  
Designation: Quality Manager

- Note: 1. The test results are only to the sample submitted for test. 2. Any correction of the test report in full or part shall invalidate the report. 3. Sample will be retained for 15 days from the date of reporting except in case of regulatory samples or specifically instructed by client. 4. Perishable samples will be discarded immediately after reporting. 5. Under no circumstance's lab accepts any liability or loss/damage caused by use or misuse of test report after invoicing or issued of test report.

**TEST REPORT**

|                           |   |                         |            |
|---------------------------|---|-------------------------|------------|
| <b>Report No</b>          | EHS360/TR/2022-23/007   | <b>Report Date</b>      | 06.06.2024 |
| <b>Site Location</b>      | <b>THIRU. N.T. SAISADA ROUGH STONE AND GRAVEL QUARRY</b><br>S.F.No.: 151(P) & 152/4, Extent: 2.28.40Ha, Kurumbapalayam Village,<br>Sathiyamangalam Taluk, Erode District. |                         |            |
| <b>Sampling Method</b>    | IS 5182   | <b>Sample Drawn by</b>  | Laboratory |
| <b>Sample Name</b>        | Air   | <b>Sample Code</b>      | EHS360/007 |
| <b>Sample Description</b> | Ambient Air Quality Monitoring  | <b>Sample Condition</b> | Good       |
| <b>Sampling Location</b>  | <b>AAQ 7 Kupandurai - 11°23'57.54"N 77°12'45.63"E</b>   |                         |            |

| Date                  | Period. hrs | PM10(µg/m3) | PM2.5(µg/m3) | SO2 (µg/m3) | NO2 (µg/m3) | O3 (µg/m3)  | NH3 (µg/m3) | CO (mg/ m3)  |
|-----------------------|-------------|-------------|--------------|-------------|-------------|-------------|-------------|--------------|
| 04.03.2024            | 7:00-7:00   | 41.7        | 22.1         | 8.3         | 23.1        | BDL(DL:5.0) | BDL(DL:1.0) | BDL(DL:1.14) |
| 05.03.2024            | 7:15-7:15   | 43.3        | 24.4         | 9.1         | 25.4        | BDL(DL:5.0) | BDL(DL:1.0) | BDL(DL:1.14) |
| 11.03.2024            | 7:00-7:00   | 42.7        | 22.3         | 5.3         | 26.5        | BDL(DL:5.0) | BDL(DL:1.0) | BDL(DL:1.14) |
| 12.03.2024            | 7:15-7:15   | 41.8        | 23.9         | 6.7         | 23.8        | BDL(DL:5.0) | BDL(DL:1.0) | BDL(DL:1.14) |
| 18.03.2024            | 7:00-7:00   | 42.5        | 21.5         | 5.8         | 25.4        | BDL(DL:5.0) | BDL(DL:1.0) | BDL(DL:1.14) |
| 19.03.2024            | 7:15-7:15   | 43.6        | 23.6         | 6.2         | 25.6        | BDL(DL:5.0) | BDL(DL:1.0) | BDL(DL:1.14) |
| 25.03.2024            | 7:00-7:00   | 41.2        | 25.7         | 8.4         | 26.5        | BDL(DL:5.0) | BDL(DL:1.0) | BDL(DL:1.14) |
| 26.03.2024            | 7:15-7:15   | 43.9        | 23.5         | 5.3         | 25.4        | BDL(DL:5.0) | BDL(DL:1.0) | BDL(DL:1.14) |
| 01.04.2024            | 7:00-7:00   | 43.3        | 21.4         | 9.3         | 25.2        | BDL(DL:5.0) | BDL(DL:1.0) | BDL(DL:1.14) |
| 02.04.2024            | 7:15-7:15   | 42.5        | 22.5         | 6.2         | 24.9        | BDL(DL:5.0) | BDL(DL:1.0) | BDL(DL:1.14) |
| 08.04.2024            | 7:00-7:00   | 43.6        | 23.3         | 5.7         | 26.3        | BDL(DL:5.0) | BDL(DL:1.0) | BDL(DL:1.14) |
| 09.04.2024            | 7:15-7:15   | 44.5        | 23.8         | 5.3         | 27.4        | BDL(DL:5.0) | BDL(DL:1.0) | BDL(DL:1.14) |
| 15.04.2024            | 7:00-7:00   | 41.4        | 21.5         | 8.4         | 25.9        | BDL(DL:5.0) | BDL(DL:1.0) | BDL(DL:1.14) |
| 16.04.2024            | 7:15-7:15   | 42.7        | 22.6         | 6.7         | 26.3        | BDL(DL:5.0) | BDL(DL:1.0) | BDL(DL:1.14) |
| 22.04.2024            | 7:00-7:00   | 43.3        | 23.4         | 8.5         | 25.8        | BDL(DL:5.0) | BDL(DL:1.0) | BDL(DL:1.14) |
| 23.04.2024            | 7:15-7:15   | 42.9        | 21.9         | 6.3         | 26.4        | BDL(DL:5.0) | BDL(DL:1.0) | BDL(DL:1.14) |
| 29.04.2024            | 7:00-7:00   | 41.7        | 23.6         | 9.4         | 25.3        | BDL(DL:5.0) | BDL(DL:1.0) | BDL(DL:1.14) |
| 30.04.2024            | 7:15-7:15   | 41.2        | 21.5         | 5.3         | 26.9        | BDL(DL:5.0) | BDL(DL:1.0) | BDL(DL:1.14) |
| 06.05.2024            | 7:00-7:00   | 43.2        | 23.4         | 5.6         | 26.9        | BDL(DL:5.0) | BDL(DL:1.0) | BDL(DL:1.14) |
| 07.05.2024            | 7:15-7:15   | 43.9        | 24.9         | 5.2         | 23.6        | BDL(DL:5.0) | BDL(DL:1.0) | BDL(DL:1.14) |
| 13.05.2024            | 7:00-7:00   | 42.5        | 21.5         | 5.7         | 24.7        | BDL(DL:5.0) | BDL(DL:1.0) | BDL(DL:1.14) |
| 14.05.2024            | 7:15-7:15   | 43.9        | 23.3         | 6.3         | 25.3        | BDL(DL:5.0) | BDL(DL:1.0) | BDL(DL:1.14) |
| 20.05.2024            | 7:00-7:00   | 42.5        | 21.4         | 9.8         | 25.8        | BDL(DL:5.0) | BDL(DL:1.0) | BDL(DL:1.14) |
| 21.05.2024            | 7:15-7:15   | 41.3        | 22.8         | 8.1         | 24.6        | BDL(DL:5.0) | BDL(DL:1.0) | BDL(DL:1.14) |
| 27.05.2024            | 7:00-7:00   | 42.8        | 23.5         | 7.6         | 24.6        | BDL(DL:5.0) | BDL(DL:1.0) | BDL(DL:1.14) |
| 29.05.2024            | 7:15-7:15   | 41.5        | 23.8         | 7.5         | 24.7        | BDL(DL:5.0) | BDL(DL:1.0) | BDL(DL:1.14) |
| <b>NAAQ* Standard</b> |             | <100        | <100         | <60         | <80         | <80         | <400        | <4           |

**Note:** BDL: Below Detection Limit ;DL: Detection Limit

**Remarks:** The values observed for the pollutants given above are within the CPCB standards.

\*\*\*\*\*End of Report\*\*\*\*\*



Verified by

Authorised Signatory

Name: Santhosh Kumar A  
Designation: Quality Manager

- Note: 1. The test results are only to the sample submitted for test. 2. Any correction of the test report in full or part shall invalidate the report. 3. Sample will be retained for 15 days from the date of reporting except in case of regulatory samples or specifically instructed by client. 4. Perishable samples will be discarded immediately after reporting. 5. Under no circumstance's lab accepts any liability or loss/damage caused by use or misuse of test report after invoicing or issued of test report.

## TEST REPORT

|                           |   |                         |            |
|---------------------------|---|-------------------------|------------|
| <b>Report No</b>          | EHS360/TR/2022-23/007   | <b>Report Date</b>      | 06.06.2024 |
| <b>Site Location</b>      | <b>THIRU. N.T. SAISADA ROUGH STONE AND GRAVEL QUARRY</b><br>S.F.No.: 151(P) & 152/4, Extent: 2.28.40Ha, Kurumbapalayam Village,<br>Sathiyamangalam Taluk, Erode District. |                         |            |
| <b>Sampling Method</b>    | IS 5182   | <b>Sample Drawn by</b>  | Laboratory |
| <b>Sample Name</b>        | Air   | <b>Sample Code</b>      | EHS360/007 |
| <b>Sample Description</b> | Ambient Air Quality Monitoring  | <b>Sample Condition</b> | Good       |
| <b>Sampling Location</b>  | <b>AAQ 7 Kuppururai - 11°23'57.54"N 77°12'45.63"E</b>   |                         |            |

| Date                  | Period. hrs | SPM (µg/m <sup>3</sup> ) | As (ng/m <sup>3</sup> ) | C6H6 (µg/m <sup>3</sup> ) | BaP (ng/m <sup>3</sup> ) | Pb (µg/m <sup>3</sup> ) | Ni (ng/m <sup>3</sup> ) |
|-----------------------|-------------|--------------------------|-------------------------|---------------------------|--------------------------|-------------------------|-------------------------|
| 04.03.2024            | 7:00-7:00   | 61.7                     | BDL (DL:0.1)            | BDL (DL:1.0)              | BDL (DL:1.0)             | BDL (DL:0.1)            | BDL (DL:0.1)            |
| 05.03.2024            | 7:15-7:15   | 63.1                     | BDL (DL:0.1)            | BDL (DL:1.0)              | BDL (DL:1.0)             | BDL (DL:0.1)            | BDL (DL:0.1)            |
| 11.03.2024            | 7:00-7:00   | 62.9                     | BDL (DL:0.1)            | BDL (DL:1.0)              | BDL (DL:1.0)             | BDL (DL:0.1)            | BDL (DL:0.1)            |
| 12.03.2024            | 7:15-7:15   | 62.3                     | BDL (DL:0.1)            | BDL (DL:1.0)              | BDL (DL:1.0)             | BDL (DL:0.1)            | BDL (DL:0.1)            |
| 18.03.2024            | 7:00-7:00   | 64.4                     | BDL (DL:0.1)            | BDL (DL:1.0)              | BDL (DL:1.0)             | BDL (DL:0.1)            | BDL (DL:0.1)            |
| 19.03.2024            | 7:15-7:15   | 63.8                     | BDL (DL:0.1)            | BDL (DL:1.0)              | BDL (DL:1.0)             | BDL (DL:0.1)            | BDL (DL:0.1)            |
| 25.03.2024            | 7:00-7:00   | 62.5                     | BDL (DL:0.1)            | BDL (DL:1.0)              | BDL (DL:1.0)             | BDL (DL:0.1)            | BDL (DL:0.1)            |
| 26.03.2024            | 7:15-7:15   | 63.9                     | BDL (DL:0.1)            | BDL (DL:1.0)              | BDL (DL:1.0)             | BDL (DL:0.1)            | BDL (DL:0.1)            |
| 01.04.2024            | 7:00-7:00   | 64.9                     | BDL (DL:0.1)            | BDL (DL:1.0)              | BDL (DL:1.0)             | BDL (DL:0.1)            | BDL (DL:0.1)            |
| 02.04.2024            | 7:15-7:15   | 62.3                     | BDL (DL:0.1)            | BDL (DL:1.0)              | BDL (DL:1.0)             | BDL (DL:0.1)            | BDL (DL:0.1)            |
| 08.04.2024            | 7:00-7:00   | 62.5                     | BDL (DL:0.1)            | BDL (DL:1.0)              | BDL (DL:1.0)             | BDL (DL:0.1)            | BDL (DL:0.1)            |
| 09.04.2024            | 7:15-7:15   | 63.3                     | BDL (DL:0.1)            | BDL (DL:1.0)              | BDL (DL:1.0)             | BDL (DL:0.1)            | BDL (DL:0.1)            |
| 15.04.2024            | 7:00-7:00   | 62.5                     | BDL (DL:0.1)            | BDL (DL:1.0)              | BDL (DL:1.0)             | BDL (DL:0.1)            | BDL (DL:0.1)            |
| 16.04.2024            | 7:15-7:15   | 63.9                     | BDL (DL:0.1)            | BDL (DL:1.0)              | BDL (DL:1.0)             | BDL (DL:0.1)            | BDL (DL:0.1)            |
| 22.04.2024            | 7:00-7:00   | 65.5                     | BDL (DL:0.1)            | BDL (DL:1.0)              | BDL (DL:1.0)             | BDL (DL:0.1)            | BDL (DL:0.1)            |
| 23.04.2024            | 7:15-7:15   | 61.2                     | BDL (DL:0.1)            | BDL (DL:1.0)              | BDL (DL:1.0)             | BDL (DL:0.1)            | BDL (DL:0.1)            |
| 29.04.2024            | 7:00-7:00   | 62.4                     | BDL (DL:0.1)            | BDL (DL:1.0)              | BDL (DL:1.0)             | BDL (DL:0.1)            | BDL (DL:0.1)            |
| 30.04.2024            | 7:15-7:15   | 62.3                     | BDL (DL:0.1)            | BDL (DL:1.0)              | BDL (DL:1.0)             | BDL (DL:0.1)            | BDL (DL:0.1)            |
| 06.05.2024            | 7:00-7:00   | 63.6                     | BDL (DL:0.1)            | BDL (DL:1.0)              | BDL (DL:1.0)             | BDL (DL:0.1)            | BDL (DL:0.1)            |
| 07.05.2024            | 7:15-7:15   | 62.5                     | BDL (DL:0.1)            | BDL (DL:1.0)              | BDL (DL:1.0)             | BDL (DL:0.1)            | BDL (DL:0.1)            |
| 13.05.2024            | 7:00-7:00   | 62.9                     | BDL (DL:0.1)            | BDL (DL:1.0)              | BDL (DL:1.0)             | BDL (DL:0.1)            | BDL (DL:0.1)            |
| 14.05.2024            | 7:15-7:15   | 61.5                     | BDL (DL:0.1)            | BDL (DL:1.0)              | BDL (DL:1.0)             | BDL (DL:0.1)            | BDL (DL:0.1)            |
| 20.05.2024            | 7:00-7:00   | 63.4                     | BDL (DL:0.1)            | BDL (DL:1.0)              | BDL (DL:1.0)             | BDL (DL:0.1)            | BDL (DL:0.1)            |
| 21.05.2024            | 7:15-7:15   | 62.8                     | BDL (DL:0.1)            | BDL (DL:1.0)              | BDL (DL:1.0)             | BDL (DL:0.1)            | BDL (DL:0.1)            |
| 27.05.2024            | 7:00-7:00   | 62.8                     | BDL (DL:0.1)            | BDL (DL:1.0)              | BDL (DL:1.0)             | BDL (DL:0.1)            | BDL (DL:0.1)            |
| 29.05.2024            | 7:15-7:15   | 63.5                     | BDL (DL:0.1)            | BDL (DL:1.0)              | BDL (DL:1.0)             | BDL (DL:0.1)            | BDL (DL:0.1)            |
| <b>NAAQ* Standard</b> |             | <200                     | <200                    | <100                      | <60                      | <80                     | <80                     |

**Note:** BDL: Below Detection Limit ;DL: Detection Limit

**Remarks:** The values observed for the pollutants given above are within the CPCB standards.

\*\*\*\*\*End of Report\*\*\*\*\*



Verified by

Authorised Signatory

Name: Santhosh Kumar A  
Designation: Quality Manager

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**TEST REPORT**

|                           |   |                              |             |
|---------------------------|---|------------------------------|-------------|
| <b>Report No</b>          | EHS360/TR/2022-23/ 008  | <b>Report Date</b>           | 06.06.2024  |
| <b>Site Location</b>      | <b>THIRU. N.T. SAISADA ROUGH STONE AND GRAVEL QUARRY</b><br>S.F.No.: 151(P) & 152/4, Extent: 2.28.40Ha, Kurumbapalayam Village,<br>Sathiyamangalam Taluk, Erode District. |                              |             |
| <b>Sampling Method</b>    | IS 9989   | <b>Sample Drawn by</b>       | Laboratory  |
| <b>Sample Name</b>        | Noise Level Monitoring  | <b>Sample Code</b>           | EHS360/ 008 |
| <b>Sample Description</b> | Ambient Noise   | <b>Sample Collected Date</b> | 27.05.2024  |

| Location    | N1 – Core Zone - 11°25'51.51"N<br>77°10'10.00"E |       |             | N2 – Near Existing Quarry - 11°25'58.11"N<br>77°10'25.55"E |       |             |        |
|-------------|---|-------|-------------|--|-------|-------------|--------|
|             | Parameter                                       | Min   | Max         | Result   | Min   | Max         | Result |
| Time        | dB(A)   | dB(A) | dB(A)       | dB(A)  | dB(A) | dB(A)       | dB(A)  |
| 06:00-07:00 | 42.5  | 50.1  | <b>47.8</b> | 39.3   | 40.5  | <b>39.9</b> |        |
| 07:00-08:00 | 43.6  | 48.8  | <b>46.9</b> | 40.6   | 45.5  | <b>43.7</b> |        |
| 08:00-09:00 | 44.7  | 45.4  | <b>45.1</b> | 40.5   | 46.9  | <b>44.8</b> |        |
| 09:00-10:00 | 45.5  | 46.6  | <b>46.1</b> | 40.7   | 48.2  | <b>45.9</b> |        |
| 10:00-11:00 | 45.7  | 47.1  | <b>46.5</b> | 41.5   | 47.2  | <b>45.2</b> |        |
| 11:00-12:00 | 46.8  | 48.1  | <b>47.5</b> | 42.8   | 45.6  | <b>44.4</b> |        |
| 12:00-13:00 | 47.6  | 50.0  | <b>49.0</b> | 43.7   | 44.5  | <b>44.1</b> |        |
| 13:00-14:00 | 47.2  | 51.5  | <b>49.9</b> | 44.2   | 47.9  | <b>46.4</b> |        |
| 14:00-15:00 | 48.3  | 55.4  | <b>53.2</b> | 45.7   | 55.2  | <b>52.7</b> |        |
| 15:00-16:00 | 48.2  | 52.6  | <b>50.9</b> | 46.8   | 50.3  | <b>48.9</b> |        |
| 16:00-17:00 | 46.7  | 51.4  | <b>49.7</b> | 45.2   | 51.7  | <b>49.6</b> |        |
| 17:00-18:00 | 45.6  | 48.8  | <b>47.5</b> | 46.6   | 49.6  | <b>48.4</b> |        |
| 18:00-19:00 | 45.3  | 48.7  | <b>47.3</b> | 46.3   | 48.5  | <b>47.5</b> |        |
| 19:00-20:00 | 43.4  | 50.0  | <b>47.8</b> | 47.2   | 50.6  | <b>49.2</b> |        |
| 20:00-21:00 | 41.6  | 45.4  | <b>43.9</b> | 47.6   | 53.6  | <b>51.6</b> |        |
| 21:00-22:00 | 40.5  | 42.4  | <b>41.6</b> | 46.5   | 55.9  | <b>53.4</b> |        |
| 22:00-23:00 | 39.4  | 49.3  | <b>46.7</b> | 42.3   | 43.7  | <b>43.1</b> |        |
| 23:00-00:00 | 38.2  | 48.3  | <b>45.7</b> | 40.3   | 41.8  | <b>41.1</b> |        |
| 00:00-01:00 | 36.7  | 46.4  | <b>43.8</b> | 40.5   | 41.4  | <b>41.0</b> |        |
| 01:00-02:00 | 36.2  | 41.9  | <b>39.9</b> | 38.6   | 39.4  | <b>39.0</b> |        |
| 02:00-03:00 | 35.8  | 40.2  | <b>38.5</b> | 37.5   | 38.1  | <b>37.8</b> |        |
| 03:00-04:00 | 37.2  | 38.8  | <b>38.1</b> | 35.6   | 35.9  | <b>35.8</b> |        |
| 04:00-05:00 | 35.6  | 37.1  | <b>36.4</b> | 36.5   | 38.5  | <b>37.6</b> |        |
| 05:00-06:00 | 35.3  | 36.7  | <b>36.1</b> | 36.9   | 37.3  | <b>37.1</b> |        |
| Result      | Day Means                                       |       | <b>47.5</b> | Day Means  |       | <b>47.0</b> |        |
|             | Night Means                                     |       | <b>39.8</b> | Night Means  |       | <b>38.5</b> |        |

**Note:** CPCB Norms Industrial Area Day Time:75 dB(A); Night Time:70 dB(A)  
The Noise level in the above location exists within the permissible limits of CPCB.

Verified by



Authorised Signatory

Name: Santhosh Kumar A  
Designation: Quality Manager

- Note: 1. The test results are only to the sample submitted for test. 2. Any correction of the test report in full or part shall invalidate the report. 3. Sample will be retained for 15 days from the date of reporting except in case of regulatory samples or specifically instructed by client. 4. Perishable samples will be discarded immediately after reporting. 5. Under no circumstance's lab accepts any liability or loss/damage caused by use or misuse of test report after invoicing or issued of test report.

**TEST REPORT**

|                           |   |                              |             |
|---------------------------|---|------------------------------|-------------|
| <b>Report No</b>          | EHS360/TR/2022-23/ 009  | <b>Report Date</b>           | 06.06.2024  |
| <b>Site Location</b>      | <b>THIRU. N.T. SAISADA ROUGH STONE AND GRAVEL QUARRY</b><br>S.F.No.: 151(P) & 152/4, Extent: 2.28.40Ha, Kurumbapalayam Village,<br>Sathiyamangalam Taluk, Erode District. |                              |             |
| <b>Sampling Method</b>    | IS 9989   | <b>Sample Drawn by</b>       | Laboratory  |
| <b>Sample Name</b>        | Noise Level Monitoring  | <b>Sample Code</b>           | EHS360/ 009 |
| <b>Sample Description</b> | Ambient Noise   | <b>Sample Collected Date</b> | 27.05.2024  |

| Location    | N3- Kurumbapalayam - 11°25'20.76"N<br>77°10'29.91"E |       |             | N4 - Thoppampalayam - 11°27'42.98"N 77°<br>8'47.69"E |       |             |        |
|-------------|---|-------|-------------|--|-------|-------------|--------|
|             | Parameter   | Min   | Max         | Result   | Min   | Max         | Result |
| Time        | dB(A)   | dB(A) | dB(A)       | dB(A)  | dB(A) | dB(A)       | dB(A)  |
| 06:00-07:00 | 42.7  | 50.4  | <b>48.1</b> | 32.9   | 40.3  | 38.0        |        |
| 07:00-08:00 | 41.5  | 49.2  | <b>46.9</b> | 33.5   | 41.6  | <b>39.2</b> |        |
| 08:00-09:00 | 40.6  | 47.5  | <b>45.3</b> | 31.9   | 38.9  | <b>36.7</b> |        |
| 09:00-10:00 | 43.7  | 51.6  | <b>49.2</b> | 36.7   | 41.3  | <b>39.6</b> |        |
| 10:00-11:00 | 42.0  | 50.3  | <b>47.9</b> | 34.6   | 42.8  | <b>40.4</b> |        |
| 11:00-12:00 | 44.7  | 54.5  | <b>51.9</b> | 35.7   | 44.3  | <b>41.9</b> |        |
| 12:00-13:00 | 35.2  | 42.8  | <b>40.5</b> | 36.8   | 45.3  | <b>42.9</b> |        |
| 13:00-14:00 | 36.7  | 41.4  | <b>39.7</b> | 31.2   | 39.8  | <b>37.4</b> |        |
| 14:00-15:00 | 34.3  | 43.4  | <b>40.9</b> | 36.9   | 43.2  | <b>41.1</b> |        |
| 15:00-16:00 | 35.6  | 44.3  | <b>41.8</b> | 33.6   | 41.3  | <b>39.0</b> |        |
| 16:00-17:00 | 32.9  | 40.8  | <b>38.4</b> | 32.5   | 40.3  | <b>38.0</b> |        |
| 17:00-18:00 | 36.2  | 42.5  | <b>40.4</b> | 34.4   | 41.5  | <b>39.3</b> |        |
| 18:00-19:00 | 32.5  | 40.1  | <b>37.8</b> | 33.5   | 42.4  | <b>39.9</b> |        |
| 19:00-20:00 | 33.7  | 41.4  | <b>39.1</b> | 38.6   | 46.5  | <b>44.1</b> |        |
| 20:00-21:00 | 32.5  | 38.7  | <b>36.6</b> | 32.6   | 40.4  | <b>38.1</b> |        |
| 21:00-22:00 | 32.5  | 40.4  | <b>38.0</b> | 35.5   | 43.2  | <b>40.9</b> |        |
| 22:00-23:00 | 31.8  | 38.7  | <b>36.5</b> | 33.9   | 41.4  | <b>39.1</b> |        |
| 23:00-00:00 | 32.6  | 40.4  | <b>38.1</b> | 34.7   | 43.1  | <b>40.7</b> |        |
| 00:00-01:00 | 34.2  | 43.3  | <b>40.8</b> | 33.7   | 41.4  | <b>39.1</b> |        |
| 01:00-02:00 | 33.6  | 41.7  | <b>39.3</b> | 32.8   | 38.6  | <b>36.6</b> |        |
| 02:00-03:00 | 32.9  | 40.5  | <b>38.2</b> | 32.2   | 35.6  | <b>34.2</b> |        |
| 03:00-04:00 | 31.5  | 39.1  | <b>36.8</b> | 32.7   | 35.6  | <b>34.4</b> |        |
| 04:00-05:00 | 32.9  | 40.7  | <b>38.4</b> | 32.8   | 34.1  | <b>33.5</b> |        |
| 05:00-06:00 | 32.6  | 42.3  | <b>39.7</b> | 33.5   | 35.5  | <b>34.6</b> |        |
| Result      | Day Means   |       | <b>42.3</b> | Day Means  |       | <b>39.7</b> |        |
|             | Night Means   |       | <b>38.7</b> | Night Means  |       | <b>36.2</b> |        |

Note: CPCB Norms Industrial Area Day Time:75 dB(A); Night Time:70 dB(A)  
The Noise level in the above location exists within the permissible limits of CPCB.

\*\*\*\*\*End of Report\*\*\*\*\*



Verified by



Authorised Signatory

Name: Santhosh Kumar A  
Designation: Quality Manager

Note: 1. The test results are only to the sample submitted for test. 2. Any correction of the test report in full or part shall invalidate the report. 3. Sample will be retained for 15 days from the date of reporting except in case of regulatory samples or specifically instructed by client. 4. Perishable samples will be discarded immediately after reporting. 5. Under no circumstance's lab accepts any liability or loss/damage caused by use or misuse of test report after invoicing or issued of test report.

**TEST REPORT**

|                           |   |                              |             |
|---------------------------|---|------------------------------|-------------|
| <b>Report No</b>          | EHS360/TR/2022-23/ 010  | <b>Report Date</b>           | 06.06.2024  |
| <b>Site Location</b>      | <b>THIRU. N.T. SAISADA ROUGH STONE AND GRAVEL QUARRY</b><br>S.F.No.: 151(P) & 152/4, Extent: 2.28.40Ha, Kurumbapalayam Village,<br>Sathiyamangalam Taluk, Erode District. |                              |             |
| <b>Sampling Method</b>    | IS 9989   | <b>Sample Drawn by</b>       | Laboratory  |
| <b>Sample Name</b>        | Noise Level Monitoring  | <b>Sample Code</b>           | EHS360/ 010 |
| <b>Sample Description</b> | Ambient Noise   | <b>Sample Collected Date</b> | 27.05.2024  |

| Location    | N5- Mayilampatti 11°23'38.14"N 77° 8'9.62"E |       |             | N6 - Shenbagapudur - 11°27'48.13"N 77°12'53.21"E |       |             |
|-------------|---|-------|-------------|--|-------|-------------|
| Parameter   | Min   | Max   | Result      | Min  | Max   | Result      |
| Time        | dB(A)                                       | dB(A) | dB(A)       | dB(A)  | dB(A) | dB(A)       |
| 06:00-07:00 | 31.6  | 38.1  | <b>36.0</b> | 36.8   | 43.1  | <b>41.0</b> |
| 07:00-08:00 | 32.6  | 40.8  | <b>38.4</b> | 37.7   | 45.5  | <b>43.2</b> |
| 08:00-09:00 | 33.9  | 41.5  | <b>39.2</b> | 38.7   | 46.2  | <b>43.9</b> |
| 09:00-10:00 | 31.5  | 39.5  | <b>37.1</b> | 34.2   | 45.9  | <b>43.2</b> |
| 10:00-11:00 | 32.5  | 40.2  | <b>37.9</b> | 36.6   | 43.6  | <b>41.4</b> |
| 11:00-12:00 | 33.7  | 41.4  | <b>39.1</b> | 37.7   | 45.9  | <b>43.5</b> |
| 12:00-13:00 | 35.6  | 43.5  | <b>41.1</b> | 38.5   | 46.6  | <b>44.2</b> |
| 13:00-14:00 | 31.8  | 38.5  | <b>36.3</b> | 39.5   | 47.2  | <b>44.9</b> |
| 14:00-15:00 | 33.9  | 41.7  | <b>39.4</b> | 42.4   | 50.1  | <b>47.8</b> |
| 15:00-16:00 | 32.6  | 40.8  | <b>38.4</b> | 41.3   | 48.6  | <b>46.3</b> |
| 16:00-17:00 | 34.8  | 43.6  | <b>41.1</b> | 40.7   | 47.2  | <b>45.1</b> |
| 17:00-18:00 | 32.7  | 40.4  | <b>38.1</b> | 42.3   | 48.2  | <b>46.2</b> |
| 18:00-19:00 | 35.1  | 43.1  | <b>40.7</b> | 41.7   | 48.7  | <b>46.5</b> |
| 19:00-20:00 | 36.1  | 40.2  | <b>38.6</b> | 40.8   | 48.1  | <b>45.8</b> |
| 20:00-21:00 | 34.3  | 43.6  | <b>41.1</b> | 36.5   | 43.2  | <b>41.0</b> |
| 21:00-22:00 | 36.5  | 47.1  | <b>44.5</b> | 34.2   | 43.7  | <b>41.2</b> |
| 22:00-23:00 | 33.7  | 41.2  | <b>38.9</b> | 32.8   | 40.8  | <b>38.4</b> |
| 23:00-00:00 | 33.9  | 42.1  | <b>39.7</b> | 33.8   | 41.1  | <b>38.8</b> |
| 00:00-01:00 | 31.5  | 39.4  | <b>37.0</b> | 34.1   | 42.3  | <b>39.9</b> |
| 01:00-02:00 | 32.9  | 40.2  | <b>37.9</b> | 32.8   | 40.7  | <b>38.3</b> |
| 02:00-03:00 | 33.5  | 41.6  | <b>39.2</b> | 32.6   | 40.9  | <b>38.5</b> |
| 03:00-04:00 | 31.5  | 38.2  | <b>36.0</b> | 33.6   | 41.5  | <b>39.1</b> |
| 04:00-05:00 | 32.7  | 40.6  | <b>38.2</b> | 32.8   | 41.4  | <b>39.0</b> |
| 05:00-06:00 | 31.3  | 38.6  | <b>36.3</b> | 31.8   | 40.8  | <b>38.3</b> |
| Result      | Day Means                                   |       | <b>39.2</b> | Day Means  |       | <b>43.7</b> |
|             | Night Means                                 |       | <b>37.8</b> | Night Means                                      |       | <b>38.9</b> |

Note: CPCB Norms Industrial Area Day Time:75 dB(A); Night Time:70 dB(A)  
The Noise level in the above location exists within the permissible limits of CPCB.

\*\*\*\*\*End of Report\*\*\*\*\*



Verified by

Authorised Signatory

Name: Santhosh Kumar A  
Designation: Quality Manager

Note: 1. The test results are only to the sample submitted for test. 2. Any correction of the test report in full or part shall invalidate the report. 3. Sample will be retained for 15 days from the date of reporting except in case of regulatory samples or specifically instructed by client. 4. Perishable samples will be discarded immediately after reporting. 5. Under no circumstance's lab accepts any liability or loss/damage caused by use or misuse of test report after invoicing or issued of test report.

**TEST REPORT**

|                           |   |                              |             |
|---------------------------|---|------------------------------|-------------|
| <b>Report No</b>          | EHS360/TR/2022-23/ 011  | <b>Report Date</b>           | 06.06.2024  |
| <b>Site Location</b>      | <b>THIRU. N.T. SAISADA ROUGH STONE AND GRAVEL QUARRY</b><br>S.F.No.: 151(P) & 152/4, Extent: 2.28.40Ha, Kurumbapalayam Village,<br>Sathiyamangalam Taluk, Erode District. |                              |             |
| <b>Sampling Method</b>    | IS 9989   | <b>Sample Drawn by</b>       | Laboratory  |
| <b>Sample Name</b>        | Noise Level Monitoring  | <b>Sample Code</b>           | EHS360/ 011 |
| <b>Sample Description</b> | Ambient Noise   | <b>Sample Collected Date</b> | 27.05.2024  |

| Location    | N7 - Kuppandurai - 11°23'57.54"N 77°12'44.90"E |       |             |
|-------------|--|-------|-------------|
| Parameter   | Min  | Max   | Result      |
| Time        | dB(A)  | dB(A) | dB(A)       |
| 06:00-07:00 | 44.5   | 46.9  | <b>45.9</b> |
| 07:00-08:00 | 44.9   | 46.9  | <b>46.0</b> |
| 08:00-09:00 | 45.1   | 47.5  | <b>46.5</b> |
| 09:00-10:00 | 45.6   | 47.6  | <b>46.7</b> |
| 10:00-11:00 | 45.9   | 48.2  | <b>47.2</b> |
| 11:00-12:00 | 44.3   | 46.3  | <b>45.4</b> |
| 12:00-13:00 | 43.2   | 46.2  | <b>45.0</b> |
| 13:00-14:00 | 42.2   | 45.5  | <b>44.2</b> |
| 14:00-15:00 | 42.5   | 46.5  | <b>44.9</b> |
| 15:00-16:00 | 42.9   | 46.7  | <b>45.2</b> |
| 16:00-17:00 | 44.6   | 46.2  | <b>45.5</b> |
| 17:00-18:00 | 45.9   | 47.5  | <b>46.8</b> |
| 18:00-19:00 | 45.7   | 47.3  | <b>46.6</b> |
| 19:00-20:00 | 45.8   | 47.6  | <b>46.8</b> |
| 20:00-21:00 | 45.2   | 48.6  | <b>47.2</b> |
| 21:00-22:00 | 45.7   | 46.3  | <b>46.0</b> |
| 22:00-23:00 | 45.4   | 47.6  | <b>46.6</b> |
| 23:00-00:00 | 38.7   | 42.3  | <b>40.9</b> |
| 00:00-01:00 | 35.9   | 42.6  | <b>40.4</b> |
| 01:00-02:00 | 34.8   | 38.7  | <b>37.2</b> |
| 02:00-03:00 | 33.9   | 35.9  | <b>35.0</b> |
| 03:00-04:00 | 34.2   | 35.5  | <b>34.9</b> |
| 04:00-05:00 | 35.2   | 38.2  | <b>37.0</b> |
| 05:00-06:00 | 36.9   | 39.2  | <b>38.2</b> |
| Result      | Day Means                                      |       | <b>46.0</b> |
|             | Night Means                                    |       | <b>37.6</b> |

\*\*\*\*\*End of Report\*\*\*\*\*

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Verified by



Authorised Signatory

Name: Santhosh Kumar A  
Designation: Quality Manager

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**TEST REPORT**

|                                |  |                              |             |
|--------------------------------|--|------------------------------|-------------|
| <b>Report No</b>               | EHS360/TR/2022-23/ 012   | <b>Report Date</b>           |             |
| <b>Site Location</b>           | <b>THIRU. N.T. SAISADA ROUGH STONE AND GRAVEL QUARRY</b><br>S.F.No.: 151(P) & 152/4, Extent: 2.28.40Ha, Kurumbapalayam Village, Sathiyamangalam Taluk, Erode District. |                              |             |
| <b>Sampling Method</b>         | SOP Method   | <b>Sample Drawn by</b>       | Laboratory  |
| <b>Sample Name</b>             | Soil   | <b>Sample Code</b>           | EHS360/ 012 |
| <b>Sample Description</b>      | Soil 1   | <b>Sample Collected Date</b> | 27.05.2024  |
| <b>Qty. of Sample Received</b> | 2 KG   | <b>Sample Received On</b>    | 27.05.2024  |
| <b>Sample Condition</b>        | Good   | <b>Test Commenced On</b>     | 29.05.2024  |
| <b>Sampling Location</b>       | Core Zone  |                              |             |

| S. No | Test Parameters                     | Protocols   | Results                |
|-------|-------------------------------------|---|------------------------|
| 01    | pH @ 25°C                           | IS 2720 Part 26 - 1987 (Reaff:2016)                                     | 8.56                   |
| 02    | Conductivity @ 25°C                 | IS 14767 - 2000 (Reaff : 2016)  | 510 µmhos/cm           |
| 03    | Water Holding Capacity              | By Gravimetric Method   | 46.8 %                 |
| 04    | Bulk Density                        | By Cylindrical Method   | 1.10 g/cm <sup>3</sup> |
| 05    | Porosity                            | By Gravimetric Method   | 45.1 %                 |
| 06    | Calcium as Ca                       | Food and Agriculture organization of the united Nation Rome 2007 : 2018 | 51.6 mg/kg             |
| 07    | Magnesium as Mg                     |   | 30.5 mg/kg             |
| 08    | Chloride as Cl                      | APHA 23 <sup>rd</sup> Edn 2019 4500 Cl B                                | 58.5 mg/kg             |
| 09    | Soluble Sulphate as SO <sub>4</sub> | IS 2720 Part 27 : 1977 (Reaff:2015)                                     | 0.0018 %               |
| 10    | Total Phosphorus as P               | IS 10158 : 1982 (Reaff: 2019)   | 4.13 mg/kg             |
| 11    | Total Nitrogen as N                 | IS 14684 : 1999 (Reaff:2019)  | 380.5 mg/kg            |
| 12    | Organic Matter                      | IS : 2720 Part 22: 1972 (Reaff: 2015)                                   | 1.34 %                 |
| 13    | Organic Carbon                      | IS : 2720 Part 22: 1972 (Reaff: 2015)                                   | 0.81 %                 |

\*\*\*\*\*End of Report\*\*\*\*\*

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Verified by



Authorised Signatory

Name: Santhosh Kumar A  
Designation : Quality Manager

Note: 1. The test results are only to the sample submitted for test. 2. Any correction of the test report in full or part shall invalidate the report. 3. Sample will be retained for 15 days from the date of reporting except in case of regulatory samples or specifically instructed by client. 4. Perishable samples will be discarded immediately after reporting. 5. Under no circumstance's lab accepts any liability or loss/damage caused by use or misuse of test report after invoicing or issued of test report.

**TEST REPORT**

|                                |  |                              |             |
|--------------------------------|--|------------------------------|-------------|
| <b>Report No</b>               | EHS360/TR/2022-23/ 012   | <b>Report Date</b>           | 06.06.2024  |
| <b>Site Location</b>           | <b>THIRU. N.T. SAISADA ROUGH STONE AND GRAVEL QUARRY</b><br>S.F.No.: 151(P) & 152/4, Extent: 2.28.40Ha, Kurumbapalayam Village, Sathiyamangalam Taluk, Erode District. |                              |             |
| <b>Sampling Method</b>         | SOP Method   | <b>Sample Drawn by</b>       | Laboratory  |
| <b>Sample Name</b>             | Soil   | <b>Sample Code</b>           | EHS360/ 012 |
| <b>Sample Description</b>      | Soil 1   | <b>Sample Collected Date</b> | 27.05.2024  |
| <b>Qty. of Sample Received</b> | 2 KG   | <b>Sample Received On</b>    | 27.05.2024  |
| <b>Sample Condition</b>        | Good   | <b>Test Commenced On</b>     | 29.05.2024  |
| <b>Sampling Location</b>       | Core Zone  |                              |             |

| S. No | Test Parameters          | Protocols                                 | Results              |
|-------|--------------------------|---|----------------------|
| 14    | <b>Texture :</b>         |   |                      |
|       | Clay                     | Gravimetric Method                        | 31.7 %               |
|       | Sand                     |   | 32.2 %               |
|       | Silt                     |   | 36.1 %               |
| 15    | Manganese as Mn          | USEPA 3050 B – 1996 & USEPA 6010 C - 2000 | 15.1 mg/kg           |
| 16    | Zinc as Zn               |   | 3.12 mg/kg           |
| 17    | Boron as B               |   | 2.15 mg/kg           |
| 18    | Potassium as K           |   | 30 mg/kg             |
| 19    | Cadmium as Cd            |   | BDL (DL : 1.0 mg/kg) |
| 20    | Total Chromium as Cr     |   | BDL (DL : 1.0 mg/kg) |
| 21    | Copper as Cu             |   | BDL (DL : 1.0 mg/kg) |
| 22    | Lead as Pb               |   | 0.59 mg/kg           |
| 23    | Iron as Fe               |   | 5.41 mg/kg           |
| 24    | Cation Exchange Capacity |   | USEPA 9080 – 1986    |

\*\*\*\*\*End of Report\*\*\*\*\*

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Verified by



Authorised Signatory

Name: Santhosh Kumar A  
Designation : Quality Manager

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**TEST REPORT**

|                                |  |                              |             |
|--------------------------------|--|------------------------------|-------------|
| <b>Report No</b>               | EHS360/TR/2022-23/ 013   | <b>Report Date</b>           | 06.06.2024  |
| <b>Site Location</b>           | <b>THIRU. N.T. SAISADA ROUGH STONE AND GRAVEL QUARRY</b><br>S.F.No.: 151(P) & 152/4, Extent: 2.28.40Ha, Kurumbapalayam Village, Sathiyamangalam Taluk, Erode District. |                              |             |
| <b>Sampling Method</b>         | SOP Method   | <b>Sample Drawn by</b>       | Laboratory  |
| <b>Sample Name</b>             | Soil   | <b>Sample Code</b>           | EHS360/ 013 |
| <b>Sample Description</b>      | Soil 2   | <b>Sample Collected Date</b> | 27.05.2024  |
| <b>Qty. of Sample Received</b> | 2 KG   | <b>Sample Received On</b>    | 27.05.2024  |
| <b>Sample Condition</b>        | Good   | <b>Test Commenced On</b>     | 29.05.2024  |
| <b>Sampling Location</b>       | <b>Soil – 2 - Kurumbapalayam</b>   |                              |             |

| S. No | Test Parameters                     | Protocols   | Results                |
|-------|-------------------------------------|---|------------------------|
| 01    | pH @ 25°C                           | IS 2720 Part 26 - 1987 (Reaff:2016)                                     | 8.29                   |
| 02    | Conductivity @ 25°C                 | IS 14767 - 2000 (Reaff : 2016)  | 452 µmhos/cm           |
| 03    | Water Holding Capacity              | By Gravimetric Method   | 45.4 %                 |
| 04    | Bulk Density                        | By Cylindrical Method   | 1.01 g/cm <sup>3</sup> |
| 05    | Porosity                            | By Gravimetric Method   | 43.9 %                 |
| 06    | Calcium as Ca                       | Food and Agriculture organization of the united Nation Rome 2007 : 2018 | 75.2 mg/kg             |
| 07    | Magnesium as Mg                     |   | 69 mg/kg               |
| 08    | Chloride as Cl                      | APHA 23 <sup>rd</sup> Edn 2019 4500 Cl B                                | 19.5 mg/kg             |
| 09    | Soluble Sulphate as SO <sub>4</sub> | IS 2720 Part 27 : 1977 (Reaff:2015)                                     | 0.0017 %               |
| 10    | Total Phosphorus as P               | IS 10158 : 1982 (Reaff: 2019)   | 3.12 mg/kg             |
| 11    | Total Nitrogen as N                 | IS 14684 : 1999 (Reaff:2019)  | 410 mg/kg              |
| 12    | Organic Matter                      | IS : 2720 Part 22: 1972 (Reaff: 2015)                                   | 2.64 %                 |
| 13    | Organic Carbon                      | IS : 2720 Part 22: 1972 (Reaff: 2015)                                   | 1.53 %                 |

\*\*\*\*\*End of Report\*\*\*\*\*

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Name: Santhosh Kumar A  
Designation : Quality Manager

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**TEST REPORT**

|                                |   |                              |             |
|--------------------------------|---|------------------------------|-------------|
| <b>Report No</b>               | EHS360/TR/2022-23/ 013  | <b>Report Date</b>           | 06.06.2024  |
| <b>Site Location</b>           | <b>THIRU. N.T. SAISADA ROUGH STONE AND GRAVEL QUARRY</b><br>S.F.No.: 151(P) & 152/4, Extent: 2.28.40Ha, Kurumbapalayam Village,<br>Sathiyamangalam Taluk, Erode District. |                              |             |
| <b>Sampling Method</b>         | SOP Method  | <b>Sample Drawn by</b>       | Laboratory  |
| <b>Sample Name</b>             | Soil  | <b>Sample Code</b>           | EHS360/ 013 |
| <b>Sample Description</b>      | Soil 2  | <b>Sample Collected Date</b> | 27.05.2024  |
| <b>Qty. of Sample Received</b> | 2 KG  | <b>Sample Received On</b>    | 27.05.2024  |
| <b>Sample Condition</b>        | Good  | <b>Test Commenced On</b>     | 29.05.2024  |
| <b>Sampling Location</b>       | <b>Soil – 2 - Kurumbapalayam</b>  |                              |             |

| S. No | Test Parameters          | Protocols                                    | Results              |
|-------|--------------------------|--|----------------------|
| 14    | <b>Texture :</b>         |  |                      |
|       | Clay                     | Gravimetric Method                           | 30.2 %               |
|       | Sand                     |  | 32.8 %               |
|       | Silt                     |  | 37.0 %               |
| 15    | Manganese as Mn          | USEPA 3050 B – 1996 &<br>USEPA 6010 C - 2000 | 24.5 mg/kg           |
| 16    | Zinc as Zn               |  | 7.15 mg/kg           |
| 17    | Boron as B               |  | 3.10 mg/kg           |
| 18    | Potassium as K           |  | 45 mg/kg             |
| 19    | Cadmium as Cd            |  | BDL (DL : 1.0 mg/kg) |
| 20    | Total Chromium as Cr     |  | BDL (DL : 1.0 mg/kg) |
| 21    | Copper as Cu             |  | BDL (DL : 1.0 mg/kg) |
| 22    | Lead as Pb               |  | 1.05 mg/kg           |
| 23    | Iron as Fe               |  | 1.25 mg/kg           |
| 24    | Cation Exchange Capacity |  | USEPA 9080 – 1986    |

\*\*\*\*\*End of Report\*\*\*\*\*



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Name: Santhosh Kumar A  
Designation : Quality Manager

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**TEST REPORT**

|                                |   |                              |             |
|--------------------------------|---|------------------------------|-------------|
| <b>Report No</b>               | EHS360/TR/2022-23/ 014  | <b>Report Date</b>           | 06.06.2024  |
| <b>Site Location</b>           | <b>THIRU. N.T. SAISADA ROUGH STONE AND GRAVEL QUARRY</b><br>S.F.No.: 151(P) & 152/4, Extent: 2.28.40Ha, Kurumbapalayam Village,<br>Sathiyamangalam Taluk, Erode District. |                              |             |
| <b>Sampling Method</b>         | SOP Method  | <b>Sample Drawn by</b>       | Laboratory  |
| <b>Sample Name</b>             | Soil  | <b>Sample Code</b>           | EHS360/ 014 |
| <b>Sample Description</b>      | Soil 3  | <b>Sample Collected Date</b> | 27.05.2024  |
| <b>Qty. of Sample Received</b> | 2 KG  | <b>Sample Received On</b>    | 27.05.2024  |
| <b>Sample Condition</b>        | Good  | <b>Test Commenced On</b>     | 29.05.2024  |
| <b>Sampling Location</b>       | <b>Soil – 3 - Thoppampalayam</b>  |                              |             |

| S. No | Test Parameters                     | Protocols   | Results                |
|-------|-------------------------------------|---|------------------------|
| 01    | pH @ 25°C                           | IS 2720 Part 26 - 1987 (Reaff:2016)                                     | 8.86                   |
| 02    | Conductivity @ 25°C                 | IS 14767 - 2000 (Reaff : 2016)  | 328 µmhos/cm           |
| 03    | Water Holding Capacity              | By Gravimetric Method   | 47.7 %                 |
| 04    | Bulk Density                        | By Cylindrical Method   | 0.99 g/cm <sup>3</sup> |
| 05    | Porosity                            | By Gravimetric Method   | 48.1 %                 |
| 06    | Calcium as Ca                       | Food and Agriculture organization of the united Nation Rome 2007 : 2018 | 30 mg/kg               |
| 07    | Magnesium as Mg                     |   | 28.5 mg/kg             |
| 08    | Chloride as Cl                      | APHA 23 <sup>rd</sup> Edn 2019 4500 Cl B                                | 40.0 mg/kg             |
| 09    | Soluble Sulphate as SO <sub>4</sub> | IS 2720 Part 27 : 1977 (Reaff:2015)                                     | 0.0017 %               |
| 10    | Total Phosphorus as P               | IS 10158 : 1982 (Reaff: 2019)   | 2.23 mg/kg             |
| 11    | Total Nitrogen as N                 | IS 14684 : 1999 (Reaff:2019)  | 6.15 mg/kg             |
| 12    | Organic Matter                      | IS : 2720 Part 22: 1972 (Reaff: 2015)                                   | 2.0 %                  |
| 13    | Organic Carbon                      | IS : 2720 Part 22: 1972 (Reaff: 2015)                                   | 1.16 %                 |

\*\*\*\*\*End of Report\*\*\*\*\*

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Name: Santhosh Kumar A  
Designation : Quality Manager

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**TESTREPORT**

|                                |  |                              |             |
|--------------------------------|--|------------------------------|-------------|
| <b>Report No</b>               | EHS360/TR/2022-23/ 014   | <b>Report Date</b>           | 06.06.2024  |
| <b>Site Location</b>           | <b>THIRU. N.T. SAISADA ROUGH STONE AND GRAVEL QUARRY</b><br>S.F.No.: 151(P) & 152/4, Extent: 2.28.40Ha, Kurumbapalayam Village, Sathiyamangalam Taluk, Erode District. |                              |             |
| <b>Sampling Method</b>         | SOP Method   | <b>Sample Drawn by</b>       | Laboratory  |
| <b>Sample Name</b>             | Soil   | <b>Sample Code</b>           | EHS360/ 014 |
| <b>Sample Description</b>      | Soil 3   | <b>Sample Collected Date</b> | 27.05.2024  |
| <b>Qty. of Sample Received</b> | 2 KG   | <b>Sample Received On</b>    | 27.05.2024  |
| <b>Sample Condition</b>        | Good   | <b>Test Commenced On</b>     | 29.05.2024  |
| <b>Sampling Location</b>       | <b>Soil – 3 - Thoppampalayam</b>   |                              |             |

| S.No | Test Parameters          | Protocols                                 | Results              |
|------|--------------------------|---|----------------------|
| 14   | <b>Texture :</b>         |   |                      |
|      | Clay                     | Gravimetric Method                        | 33.1 %               |
|      | Sand                     |   | 30.8 %               |
|      | Silt                     |   | 36.1 %               |
| 15   | Manganese as Mn          | USEPA 3050 B – 1996 & USEPA 6010 C - 2000 | 20.4 mg/kg           |
| 16   | Zinc as Zn               |   | 5.61 mg/kg           |
| 17   | Boron as B               |   | 5.26 mg/kg           |
| 18   | Potassium as K           |   | 7.9 mg/kg            |
| 19   | Cadmium as Cd            |   | BDL (DL : 1.0 mg/kg) |
| 20   | Total Chromium as Cr     |   | 2.05                 |
| 21   | Copper as Cu             |   | BDL (DL : 1.0 mg/kg) |
| 22   | Lead as Pb               |   | 0.97 mg/kg           |
| 23   | Iron as Fe               |   | 1.12 mg/kg           |
| 24   | Cation Exchange Capacity |   | USEPA 9080 – 1986    |

\*\*\*\*\*End of Report\*\*\*\*\*



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Name: Santhosh Kumar A  
Designation : Quality Manager

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**TEST REPORT**

|                                |   |                              |             |
|--------------------------------|---|------------------------------|-------------|
| <b>Report No</b>               | EHS360/TR/2022-23/ 015  | <b>Report Date</b>           | 06.06.2024  |
| <b>Site Location</b>           | <b>THIRU. N.T. SAISADA ROUGH STONE AND GRAVEL QUARRY</b><br>S.F.No.: 151(P) & 152/4, Extent: 2.28.40Ha, Kurumbapalayam Village,<br>Sathiyamangalam Taluk, Erode District. |                              |             |
| <b>Sampling Method</b>         | SOP Method  | <b>Sample Drawn by</b>       | Laboratory  |
| <b>Sample Name</b>             | Soil  | <b>Sample Code</b>           | EHS360/ 015 |
| <b>Sample Description</b>      | Soil 4  | <b>Sample Collected Date</b> | 27.05.2024  |
| <b>Qty. of Sample Received</b> | 2 KG  | <b>Sample Received On</b>    | 27.05.2024  |
| <b>Sample Condition</b>        | Good  | <b>Test Commenced On</b>     | 29.05.2024  |
| <b>Sampling Location</b>       | <b>Soil – 4 – Mayilampatti</b>  |                              |             |

| S. No | Test Parameters                     | Protocols   | Results                |
|-------|-------------------------------------|---|------------------------|
| 01    | pH @ 25°C                           | IS 2720 Part 26 - 1987 (Reaff:2016)                                     | 8.66                   |
| 02    | Conductivity @ 25°C                 | IS 14767 - 2000 (Reaff : 2016)  | 502 µmhos/cm           |
| 03    | Water Holding Capacity              | By Gravimetric Method   | 46.2. %                |
| 04    | Bulk Density                        | By Cylindrical Method   | 1.03 g/cm <sup>3</sup> |
| 05    | Porosity                            | By Gravimetric Method   | 45.12 %                |
| 06    | Calcium as Ca                       | Food and Agriculture organization of the united Nation Rome 2007 : 2018 | 95.6 mg/kg             |
| 07    | Magnesium as Mg                     |   | 60.3 mg/kg             |
| 08    | Chloride as Cl                      | APHA 23 <sup>rd</sup> Edn 2019 4500 Cl B                                | 46 mg/kg               |
| 09    | Soluble Sulphate as SO <sub>4</sub> | IS 2720 Part 27 : 1977 (Reaff:2015)                                     | 0.0031 %               |
| 10    | Total Phosphorus as P               | IS 10158 : 1982 (Reaff: 2019)   | 2.55 mg/kg             |
| 11    | Total Nitrogen as N                 | IS 14684 : 1999 (Reaff:2019)  | 465.4 mg/kg            |
| 12    | Organic Matter                      | IS : 2720 Part 22: 1972 (Reaff: 2015)                                   | 1.26 %                 |
| 13    | Organic Carbon                      | IS : 2720 Part 22: 1972 (Reaff: 2015)                                   | 0.73 %                 |

\*\*\*\*\*End of Report\*\*\*\*\*



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Authorised Signatory

Name: Santhosh Kumar A  
Designation : Quality Manager

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**TEST REPORT**

|                                |   |                              |             |
|--------------------------------|---|------------------------------|-------------|
| <b>Report No</b>               | EHS360/TR/2022-23/ 015  | <b>Report Date</b>           | 06.06.2024  |
| <b>Site Location</b>           | <b>THIRU. N.T. SAISADA ROUGH STONE AND GRAVEL QUARRY</b><br>S.F.No.: 151(P) & 152/4, Extent: 2.28.40Ha, Kurumbapalayam Village,<br>Sathiyamangalam Taluk, Erode District. |                              |             |
| <b>Sampling Method</b>         | SOP Method  | <b>Sample Drawn by</b>       | Laboratory  |
| <b>Sample Name</b>             | Soil  | <b>Sample Code</b>           | EHS360/ 015 |
| <b>Sample Description</b>      | Soil 4  | <b>Sample Collected Date</b> | 27.05.2024  |
| <b>Qty. of Sample Received</b> | 2 KG  | <b>Sample Received On</b>    | 27.05.2024  |
| <b>Sample Condition</b>        | Good  | <b>Test Commenced On</b>     | 29.05.2024  |
| <b>Sampling Location</b>       | <b>Soil – 4 – Mayilampatti</b>  |                              |             |

| S. No | Test Parameters          | Protocols                                    | Results              |
|-------|--------------------------|--|----------------------|
| 14    | <b>Texture :</b>         |  |                      |
|       | Clay                     | Gravimetric Method                           | 32.2 %               |
|       | Sand                     |  | 30.9 %               |
|       | Silt                     |  | 36.9 %               |
| 15    | Manganese as Mn          | USEPA 3050 B – 1996 &<br>USEPA 6010 C - 2000 | 19.5 mg/kg           |
| 16    | Zinc as Zn               |  | 4.88 mg/kg           |
| 17    | Boron as B               |  | 2.91 mg/kg           |
| 18    | Potassium as K           |  | 35 mg/kg             |
| 19    | Cadmium as Cd            |  | BDL (DL : 1.0 mg/kg) |
| 20    | Total Chromium as Cr     |  | 15.9                 |
| 21    | Copper as Cu             |  | BDL (DL : 1.0 mg/kg) |
| 22    | Lead as Pb               |  | 1.57 mg/kg           |
| 23    | Iron as Fe               |  | 2.23 mg/kg           |
| 24    | Cation Exchange Capacity |  | USEPA 9080 – 1986    |

\*\*\*\*\*End of Report\*\*\*\*\*

Page 1 of 1

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Name: Santhosh Kumar A  
Designation : Quality Manager

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**TEST REPORT**

|                                |   |                              |             |
|--------------------------------|---|------------------------------|-------------|
| <b>Report No</b>               | EHS360/TR/2022-23/ 016  | <b>Report Date</b>           | 06.06.2024  |
| <b>Site Location</b>           | <b>THIRU. N.T. SAISADA ROUGH STONE AND GRAVEL QUARRY</b><br>S.F.No.: 151(P) & 152/4, Extent: 2.28.40Ha, Kurumbapalayam Village,<br>Sathiyamangalam Taluk, Erode District. |                              |             |
| <b>Sampling Method</b>         | SOP Method  | <b>Sample Drawn by</b>       | Laboratory  |
| <b>Sample Name</b>             | Soil  | <b>Sample Code</b>           | EHS360/ 016 |
| <b>Sample Description</b>      | Soil 5  | <b>Sample Collected Date</b> | 27.05.2024  |
| <b>Qty. of Sample Received</b> | 2 KG  | <b>Sample Received On</b>    | 27.05.2024  |
| <b>Sample Condition</b>        | Good  | <b>Test Commenced On</b>     | 29.05.2024  |
| <b>Sampling Location</b>       | <b>Soil – 5 – Shenbagapudur</b>   |                              |             |

| S. No | Test Parameters                     | Protocols   | Results                |
|-------|-------------------------------------|---|------------------------|
| 01    | pH @ 25°C                           | IS 2720 Part 26 - 1987 (Reaff:2016)                                     | 8.91                   |
| 02    | Conductivity @ 25°C                 | IS 14767 - 2000 (Reaff : 2016)  | 443 µmhos/cm           |
| 03    | Water Holding Capacity              | By Gravimetric Method   | 42.8 %                 |
| 04    | Bulk Density                        | By Cylindrical Method   | 1.05 g/cm <sup>3</sup> |
| 05    | Porosity                            | By Gravimetric Method   | 41.5 %                 |
| 06    | Calcium as Ca                       | Food and Agriculture organization of the united Nation Rome 2007 : 2018 | 52.6 mg/kg             |
| 07    | Magnesium as Mg                     |   | 34.4 mg/kg             |
| 08    | Chloride as Cl                      | APHA 23 <sup>rd</sup> Edn 2019 4500 Cl B                                | 25 mg/kg               |
| 09    | Soluble Sulphate as SO <sub>4</sub> | IS 2720 Part 27 : 1977 (Reaff:2015)                                     | 0.0019 %               |
| 10    | Total Phosphorus as P               | IS 10158 : 1982 (Reaff: 2019)   | 3.12 mg/kg             |
| 11    | Total Nitrogen as N                 | IS 14684 : 1999 (Reaff:2019)  | 405 mg/kg              |
| 12    | Organic Matter                      | IS : 2720 Part 22: 1972 (Reaff: 2015)                                   | 1.74 %                 |
| 13    | Organic Carbon                      | IS : 2720 Part 22: 1972 (Reaff: 2015)                                   | 1.01 %                 |

\*\*\*\*\*End of Report\*\*\*\*\*

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Name: Santhosh Kumar A  
Designation : Quality Manager

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**TEST REPORT**

|                                |   |                              |             |
|--------------------------------|---|------------------------------|-------------|
| <b>Report No</b>               | EHS360/TR/2022-23/ 016  | <b>Report Date</b>           | 06.06.2024  |
| <b>Site Location</b>           | <b>THIRU. N.T. SAISADA ROUGH STONE AND GRAVEL QUARRY</b><br>S.F.No.: 151(P) & 152/4, Extent: 2.28.40Ha, Kurumbapalayam Village,<br>Sathiyamangalam Taluk, Erode District. |                              |             |
| <b>Sampling Method</b>         | SOP Method  | <b>Sample Drawn by</b>       | Laboratory  |
| <b>Sample Name</b>             | Soil  | <b>Sample Code</b>           | EHS360/ 016 |
| <b>Sample Description</b>      | Soil 2  | <b>Sample Collected Date</b> | 27.05.2024  |
| <b>Qty. of Sample Received</b> | 2 KG  | <b>Sample Received On</b>    | 27.05.2024  |
| <b>Sample Condition</b>        | Good  | <b>Test Commenced On</b>     | 29.05.2024  |
| <b>Sampling Location</b>       | <b>Soil – 5 – Shenbagapudur</b>   |                              |             |

| S. No | Test Parameters          | Protocols                                    | Results              |
|-------|--------------------------|--|----------------------|
| 14    | <b>Texture :</b>         |  |                      |
|       | Clay                     | Gravimetric Method                           | 32.5 %               |
|       | Sand                     |  | 30.1 %               |
|       | Silt                     |  | 37.4 %               |
| 15    | Manganese as Mn          | USEPA 3050 B – 1996 &<br>USEPA 6010 C - 2000 | 15.5 mg/kg           |
| 16    | Zinc as Zn               |  | 2.35 mg/kg           |
| 17    | Boron as B               |  | 4.12 mg/kg           |
| 18    | Potassium as K           |  | 15 mg/kg             |
| 19    | Cadmium as Cd            |  | BDL (DL : 1.0 mg/kg) |
| 20    | Total Chromium as Cr     |  | 4.12                 |
| 21    | Copper as Cu             |  | BDL (DL : 1.0 mg/kg) |
| 22    | Lead as Pb               |  | 2.55 mg/kg           |
| 23    | Iron as Fe               |  | 11.4 mg/kg           |
| 24    | Cation Exchange Capacity |  | USEPA 9080 – 1986    |

\*\*\*\*\*End of Report\*\*\*\*\*

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Name: Santhosh Kumar A  
Designation : Quality Manager

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**TEST REPORT**

|                                |   |                              |             |
|--------------------------------|---|------------------------------|-------------|
| <b>Report No</b>               | EHS360/TR/2022-23/ 017  | <b>Report Date</b>           | 06.06.2024  |
| <b>Site Location</b>           | <b>THIRU. N.T. SAISADA ROUGH STONE AND GRAVEL QUARRY</b><br>S.F.No.: 151(P) & 152/4, Extent: 2.28.40Ha, Kurumbapalayam Village,<br>Sathiyamangalam Taluk, Erode District. |                              |             |
| <b>Sampling Method</b>         | SOP Method  | <b>Sample Drawn by</b>       | Laboratory  |
| <b>Sample Name</b>             | Soil  | <b>Sample Code</b>           | EHS360/ 017 |
| <b>Sample Description</b>      | Soil 6  | <b>Sample Collected Date</b> | 27.05.2024  |
| <b>Qty. of Sample Received</b> | 2 KG  | <b>Sample Received On</b>    | 27.05.2024  |
| <b>Sample Condition</b>        | Good  | <b>Test Commenced On</b>     | 29.05.2024  |
| <b>Sampling Location</b>       | <b>Soil – 6 - Kuppandurai</b>   |                              |             |

| S. No | Test Parameters                     | Protocols   | Results                |
|-------|-------------------------------------|---|------------------------|
| 01    | pH @ 25°C                           | IS 2720 Part 26 - 1987 (Reaff:2016)                                     | 8.33                   |
| 02    | Conductivity @ 25°C                 | IS 14767 - 2000 (Reaff : 2016)  | 466 µmhos/cm           |
| 03    | Water Holding Capacity              | By Gravimetric Method   | 46.0 %                 |
| 04    | Bulk Density                        | By Cylindrical Method   | 1.11 g/cm <sup>3</sup> |
| 05    | Porosity                            | By Gravimetric Method   | 47.1 %                 |
| 06    | Calcium as Ca                       | Food and Agriculture organization of the united Nation Rome 2007 : 2018 | 45.5 mg/kg             |
| 07    | Magnesium as Mg                     |   | 25.2 mg/kg             |
| 08    | Chloride as Cl                      | APHA 23 <sup>rd</sup> Edn 2019 4500 Cl B                                | 52 mg/kg               |
| 09    | Soluble Sulphate as SO <sub>4</sub> | IS 2720 Part 27 : 1977 (Reaff:2015)                                     | 0.0010%                |
| 10    | Total Phosphorus as P               | IS 10158 : 1982 (Reaff: 2019)   | 3.12 mg/kg             |
| 11    | Total Nitrogen as N                 | IS 14684 : 1999 (Reaff:2019)  | 451.5 mg/kg            |
| 12    | Organic Matter                      | IS : 2720 Part 22: 1972 (Reaff: 2015)                                   | 1.81 %                 |
| 13    | Organic Carbon                      | IS : 2720 Part 22: 1972 (Reaff: 2015)                                   | 1.05 %                 |

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Name: Santhosh Kumar A  
Designation : Quality Manager

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**TEST REPORT**

|                                |   |                              |             |
|--------------------------------|---|------------------------------|-------------|
| <b>Report No</b>               | EHS360/TR/2022-23/ 017  | <b>Report Date</b>           | 06.06.2024  |
| <b>Site Location</b>           | <b>THIRU. N.T. SAISADA ROUGH STONE AND GRAVEL QUARRY</b><br>S.F.No.: 151(P) & 152/4, Extent: 2.28.40Ha, Kurumbapalayam Village,<br>Sathiyamangalam Taluk, Erode District. |                              |             |
| <b>Sampling Method</b>         | SOP Method  | <b>Sample Drawn by</b>       | Laboratory  |
| <b>Sample Name</b>             | Soil  | <b>Sample Code</b>           | EHS360/ 017 |
| <b>Sample Description</b>      | Soil 6  | <b>Sample Collected Date</b> | 27.05.2024  |
| <b>Qty. of Sample Received</b> | 2 KG  | <b>Sample Received On</b>    | 27.05.2024  |
| <b>Sample Condition</b>        | Good  | <b>Test Commenced On</b>     | 29.05.2024  |
| <b>Sampling Location</b>       | <b>Soil – 6 - Kuppandurai</b>   |                              |             |

| S. No | Test Parameters          | Protocols                                       | Results              |
|-------|--------------------------|---|----------------------|
| 14    | <b>Texture :</b>         |   |                      |
|       | Clay                     | Gravimetric Method                              | 30.5 %               |
|       | Sand                     |   | 31.8 %               |
|       | Silt                     |   | 37.7 %               |
| 15    | Manganese as Mn          | USEPA 3050 B – 1996<br>&<br>USEPA 6010 C - 2000 | 35 mg/kg             |
| 16    | Zinc as Zn               |   | 5.26 mg/kg           |
| 17    | Boron as B               |   | 1.05 mg/kg           |
| 18    | Potassium as K           |   | 18.7 mg/kg           |
| 19    | Cadmium as Cd            |   | BDL (DL : 1.0 mg/kg) |
| 20    | Total Chromium as Cr     |   | 11.0                 |
| 21    | Copper as Cu             |   | BDL (DL : 1.0 mg/kg) |
| 22    | Lead as Pb               |   | 2.11 mg/kg           |
| 23    | Iron as Fe               |   | 5.23 mg/kg           |
| 24    | Cation Exchange Capacity |   | USEPA 9080 – 1986    |

\*\*\*\*\*End of Report\*\*\*\*\*

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Name: Santhosh Kumar A  
Designation : Quality Manager

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**TEST REPORT**


|                                |  |                              |            |
|--------------------------------|--|------------------------------|------------|
| <b>Report No</b>               | EHS360/TR/2022-23/ 018   | <b>Report Date</b>           | 06.06.2024 |
| <b>Site Location</b>           | <b>THIRU. N.T. SAISADA ROUGH STONE AND GRAVEL QUARRY</b><br>S.F.No.: 151(P) & 152/4, Extent: 2.28.40Ha, Kurumbapalayam Village, Sathiyamangalam Taluk, Erode District. |                              |            |
| <b>Sampling Method</b>         | SOP Method   | <b>Sample Drawn by</b>       | Laboratory |
| <b>Sample Name</b>             | Water  | <b>Sample Code</b>           | EHS360/018 |
| <b>Sample Description</b>      | Surface Water (SW-1)   | <b>Sample Collected Date</b> | 27.05.2024 |
| <b>Qty. of Sample Received</b> | 2 Litres   | <b>Sample Received On</b>    | 27.05.2024 |
| <b>Sample Condition</b>        | Fit for Analysis   | <b>Test Commenced On</b>     | 29.05.2024 |
| <b>Sampling Location</b>       | <b>Bhavanisagar Reservoir</b>  |                              |            |

| S.No.                       | Parameters                            | Test Method                              | RESULTS           |
|-----------------------------|---------------------------------------|--|-------------------|
| <b>Discipline: Chemical</b> |                                       |  |                   |
| 1                           | Colour                                | IS 3025 Part 4:1983                      | 5 Hazen           |
| 2                           | Odour                                 | IS 3025 Part 5:2018                      | Agreeable         |
| 3                           | pH at 25°C                            | IS 3025 Part 11:1983                     | 7.62              |
| 4                           | Conductivity @ 25°C                   | IS 3025 Part 14:2013                     | 935 µmhos/cm      |
| 5                           | Turbidity                             | IS 3025 Part 10:1984                     | 6.5 NTU           |
| 6                           | Total Dissolved Solids                | IS 3025 Part 16:1984                     | 551 mg/l          |
| 7                           | Total Hardness as CaCO <sub>3</sub>   | IS 3025 Part 21:2009                     | 189.92 mg/l       |
| 8                           | Calcium as Ca                         | IS 3025 Part 40:1991                     | 34.1 mg/l         |
| 9                           | Magnesium as Mg                       | IS 3025 Part 46:1994                     | 25.5 mg/l         |
| 10                          | Total Alkalinity as CaCO <sub>3</sub> | IS 3025 Part 23:1986                     | 180 mg/l          |
| 11                          | Chloride as Cl                        | IS 3025 Part 32:1988                     | 102.2 mg/l        |
| 12                          | Sulphate as SO <sub>4</sub>           | IS 3025 Part 24:1986                     | 59.5 mg/l         |
| 13                          | Iron as Fe                            | IS 3025 Part 53:2003                     | 0.21 mg/l         |
| 14                          | Residual Free Chlorine                | IS 3025 Part 26:1986                     | BDL (DL:0.1 mg/l) |
| 15                          | Fluoride as F                         | APHA 23 <sup>rd</sup> Edn. 2017:4500 F,D | 0.17 mg/l         |
| 16                          | Nitrate as NO <sub>3</sub>            | IS 3025 Part 34:1988                     | 10.2 mg/l         |

\*\*\*\*\*End of Report\*\*\*\*\*

Page 1 of 1

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Name: Santhosh Kumar A  
Designation: Quality Manager

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**TEST REPORT**

|                                |   |                              |            |
|--------------------------------|---|------------------------------|------------|
| <b>Report No</b>               | EHS360/TR/2022-23/018   | <b>Report Date</b>           | 06.06.2024 |
| <b>Site Location</b>           | <b>THIRU. N.T. SAISADA ROUGH STONE AND GRAVEL QUARRY</b><br>S.F.No.: 151(P) & 152/4, Extent: 2.28.40Ha, Kurumbapalayam Village,<br>Sathiyamangalam Taluk, Erode District. |                              |            |
| <b>Sampling Method</b>         | SOP Method  | <b>Sample Drawn by</b>       | Laboratory |
| <b>Sample Name</b>             | Water   | <b>Sample Code</b>           | EHS360/018 |
| <b>Sample Description</b>      | Surface Water (SW-1)  | <b>Sample Collected Date</b> | 27.05.2024 |
| <b>Qty. of Sample Received</b> | 2 Litres  | <b>Sample Received On</b>    | 27.05.2024 |
| <b>Sample Condition</b>        | Fit for Analysis  | <b>Test Commenced On</b>     | 29.05.2024 |
| <b>Sampling Location</b>       | <b>Bhavanisagar Reservoir</b>   |                              |            |

| S.No. | Parameters   | Test Method                               | RESULTS              |
|-------|--|---|----------------------|
| 17    | Copper as Cu   | IS 3025 Part 65:2014                      | BDL (DL:0.01 mg/l)   |
| 18    | Manganese as Mn  | IS 3025 Part 65:2014                      | BDL (DL:0.01 mg/l)   |
| 19    | Mercury as Hg  | USEPA 200.8                               | BDL (DL:0.0005 mg/l) |
| 20    | Cadmium as Cd  | IS 3025 Part 65:2014                      | BDL (DL:0.001 mg/l)  |
| 21    | Selenium as Se   | IS 3025 Part 65:2014                      | BDL (DL:0.005 mg/l)  |
| 22    | Aluminium as Al  | IS 3025 Part 65:2014 (Reaff:2019)         | BDL (DL:0.005 mg/l)  |
| 23    | Lead as Pb   | IS 3025 Part 65:2014 (Reaff:2019)         | BDL (DL:0.005 mg/l)  |
| 24    | Zinc as Zn   | IS 3025 Part 65:2014 (Reaff:2019)         | BDL(DL : 0.05 mg/l)  |
| 25    | Total Chromium as Cr                                   | IS 3025 Part 65:2014 (Reaff:2019)         | BDL(DL : 0.02 mg/l)  |
| 26    | Boron as B   | IS 3025 Part 65:2014 (Reaff:2019)         | BDL(DL : 0.05 mg/l)  |
| 27    | Mineral Oil  | IS 3025 Part 39-1991 (Reaff. 2019)        | BDL(DL : 0.01 mg/l)  |
| 28    | Phenolic compounds as C <sub>6</sub> H <sub>5</sub> OH | IS 3025 Part 43-1992(Reaff: 2019)         | BDL (DL:0.0005 mg/l) |
| 29    | Anionic Detergents (as MBAS)                           | IS 13428 – 2005 (Reaff:2019)<br>(Annex K) | BDL (DL:0.01 mg/l)   |
| 30    | Cyanide as CN  | IS 3025 Part 27-1986 (Reaff. 2019)        | BDL (DL:0.01 mg/l)   |
| 31    | BOD @ 27°C for 3 days                                  | IS 3025 Part 44:1993 (Reaff:2019)         | 8.6 mg/l             |
| 32    | Chemical Oxygen Demand                                 | IS 3025 Part 58:2006 (Reaff:2017)         | 40 mg/l              |
| 33    | Dissolved Oxygen                                       | IS 3025 Part 38:1989 (Reaff:2019)         | 5.5 mg/l             |
| 34    | Barium as Ba   | IS 3025 Part 65:2014 (Reaff:2019)         | BDL(DL:0.05 mg/l)    |
| 35    | Ammonia (as total ammonia-N)                           | IS 3025 Part 34-1988 (Reaff. 2019)        | 1.3 mg/l             |
| 36    | Sulphide as H <sub>2</sub> S                           | IS 3025 Part 29-1986 (Reaff: 2019)        | BDL (DL:0.01 mg/l)   |
| 37    | Molybdenum as Mo                                       | IS 3025 Part 65:2014 (Reaff:2019)         | BDL (DL:0.02 mg/l)   |
| 38    | Total Arsenic as As                                    | IS 3025 Part 65:2014 (Reaff:2019)         | BDL (DL:0.005 mg/l)  |
| 39    | Total Suspended Solids                                 | IS 3025 Part 17 -1984 (Reaff:2017)        | 17 mg/l              |
|       | <b>Discipline: Biological</b>                          | <b>Group: Water</b>                       |                      |
| 40    | Total Coliform   | APHA 23 <sup>rd</sup> Edn. 2017:9221B     | 500 MPN/100ml        |
| 41    | <i>Escherichia coli</i>                                | APHA 23 <sup>rd</sup> Edn. 2017:9221F     | 110 MPN/100ml        |

\*\*\*\*\*End of Report\*\*\*\*\*



Verified by

Authorised Signatory

  
Name: Santhosh Kumar A

Designation : Quality Manager

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**TEST REPORT**

|                                |   |                              |            |
|--------------------------------|---|------------------------------|------------|
| <b>Report No</b>               | EHS360/TR/2022-23/ 019  | <b>Report Date</b>           | 06.06.2024 |
| <b>Site Location</b>           | <b>THIRU. N.T. SAISADA ROUGH STONE AND GRAVEL QUARRY</b><br>S.F.No.: 151(P) & 152/4, Extent: 2.28.40Ha, Kurumbapalayam Village,<br>Sathiyamangalam Taluk, Erode District. |                              |            |
| <b>Sampling Method</b>         | SOP Method  | <b>Sample Drawn by</b>       | Laboratory |
| <b>Sample Name</b>             | Water   | <b>Sample Code</b>           | EHS360/019 |
| <b>Sample Description</b>      | Surface Water (SW-2)  | <b>Sample Collected Date</b> | 27.05.2024 |
| <b>Qty. of Sample Received</b> | 2 Litres  | <b>Sample Received On</b>    | 27.05.2024 |
| <b>Sample Condition</b>        | Fit for Analysis  | <b>Test Commenced On</b>     | 29.05.2024 |
| <b>Sampling Location</b>       | <b>Bhavani River</b>  |                              |            |

| S.No.                       | Parameters                            | Test Method                              | RESULTS           |
|-----------------------------|---------------------------------------|--|-------------------|
| <b>Discipline: Chemical</b> |                                       |  |                   |
| 1                           | Colour                                | IS 3025 Part 4:1983                      | 5 Hazen           |
| 2                           | Odour                                 | IS 3025 Part 5:2018                      | Agreeable         |
| 3                           | pH at 25°C                            | IS 3025 Part 11:1983                     | 7.01              |
| 4                           | Conductivity @ 25°C                   | IS 3025 Part 14:2013                     | µmhos/cm          |
| 5                           | Turbidity                             | IS 3025 Part 10:1984                     | 5.1 NTU           |
| 6                           | Total Dissolved Solids                | IS 3025 Part 16:1984                     | 490 mg/l          |
| 7                           | Total Hardness as CaCO <sub>3</sub>   | IS 3025 Part 21:2009                     | 176.65 mg/l       |
| 8                           | Calcium as Ca                         | IS 3025 Part 40:1991                     | 30.1 mg/l         |
| 9                           | Magnesium as Mg                       | IS 3025 Part 46:1994                     | 24.7 mg/l         |
| 10                          | Total Alkalinity as CaCO <sub>3</sub> | IS 3025 Part 23:1986                     | 155 mg/l          |
| 11                          | Chloride as Cl                        | IS 3025 Part 32:1988                     | 100.3 mg/l        |
| 12                          | Sulphate as SO <sub>4</sub>           | IS 3025 Part 24:1986                     | 55 mg/l           |
| 13                          | Iron as Fe                            | IS 3025 Part 53:2003                     | 0.21 mg/l         |
| 14                          | Residual Free Chlorine                | IS 3025 Part 26:1986                     | BDL (DL:0.1 mg/l) |
| 15                          | Fluoride as F                         | APHA 23 <sup>rd</sup> Edn. 2017:4500 F,D | 0.27 mg/l         |
| 16                          | Nitrate as NO <sub>3</sub>            | IS 3025 Part 34:1988                     | 10 mg/l           |

\*\*\*\*\*End of Report\*\*\*\*\*

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Name: Santhosh Kumar A  
Designation: Quality Manager

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## TEST REPORT

|                                |   |                              |            |
|--------------------------------|---|------------------------------|------------|
| <b>Report No</b>               | EHS360/TR/2022-23/019   | <b>Report Date</b>           | 06.06.2024 |
| <b>Site Location</b>           | <b>THIRU. N.T. SAISADA ROUGH STONE AND GRAVEL QUARRY</b><br>S.F.No.: 151(P) & 152/4, Extent: 2.28.40Ha, Kurumbapalayam Village,<br>Sathiyamangalam Taluk, Erode District. |                              |            |
| <b>Sampling Method</b>         | SOP Method  | <b>Sample Drawn by</b>       | Laboratory |
| <b>Sample Name</b>             | Water   | <b>Sample Code</b>           | EHS360/019 |
| <b>Sample Description</b>      | Surface Water (SW-2)  | <b>Sample Collected Date</b> | 27.05.2024 |
| <b>Qty. of Sample Received</b> | 2 Litres  | <b>Sample Received On</b>    | 27.05.2024 |
| <b>Sample Condition</b>        | Fit for Analysis  | <b>Test Commenced On</b>     | 29.05.2024 |
| <b>Sampling Location</b>       | <b>Bhavani River</b>  |                              |            |

| S.No. | Parameters   | Test Method                               | RESULTS              |
|-------|--|---|----------------------|
| 17    | Copper as Cu   | IS 3025 Part 65:2014                      | BDL (DL:0.01 mg/l)   |
| 18    | Manganese as Mn  | IS 3025 Part 65:2014                      | BDL (DL:0.02 mg/l)   |
| 19    | Mercury as Hg  | USEPA 200.8                               | BDL (DL:0.0005 mg/l) |
| 20    | Cadmium as Cd  | IS 3025 Part 65:2014                      | BDL (DL:0.001 mg/l)  |
| 21    | Selenium as Se   | IS 3025 Part 65:2014                      | BDL (DL:0.005 mg/l)  |
| 22    | Aluminium as Al  | IS 3025 Part 65:2014 (Reaff:2019)         | BDL (DL:0.005 mg/l)  |
| 23    | Lead as Pb   | IS 3025 Part 65:2014 (Reaff:2019)         | BDL (DL:0.005 mg/l)  |
| 24    | Zinc as Zn   | IS 3025 Part 65:2014 (Reaff:2019)         | BDL(DL : 0.05 mg/l)  |
| 25    | Total Chromium as Cr                                   | IS 3025 Part 65:2014 (Reaff:2019)         | BDL(DL : 0.02 mg/l)  |
| 26    | Boron as B   | IS 3025 Part 65:2014 (Reaff:2019)         | BDL(DL : 0.05 mg/l)  |
| 27    | Mineral Oil  | IS 3025 Part 39-1991 (Reaff. 2019)        | BDL(DL : 0.01 mg/l)  |
| 28    | Phenolic compounds as C <sub>6</sub> H <sub>5</sub> OH | IS 3025 Part 43-1992(Reaff: 2019)         | BDL (DL:0.0005 mg/l) |
| 29    | Anionic Detergents (as MBAS)                           | IS 13428 – 2005 (Reaff:2019)<br>(Annex K) | BDL (DL:0.01 mg/l)   |
| 30    | Cyanide as CN  | IS 3025 Part 27-1986 (Reaff. 2019)        | BDL (DL:0.01 mg/l)   |
| 31    | BOD @ 27°C for 3 days                                  | IS 3025 Part 44:1993 (Reaff:2019)         | 8.1 mg/l             |
| 32    | Chemical Oxygen Demand                                 | IS 3025 Part 58:2006 (Reaff:2017)         | 30 mg/l              |
| 33    | Dissolved Oxygen                                       | IS 3025 Part 38:1989 (Reaff:2019)         | 5.2 mg/l             |
| 34    | Barium as Ba   | IS 3025 Part 65:2014 (Reaff:2019)         | BDL(DL:0.05 mg/l)    |
| 35    | Ammonia (as total ammonia-N)                           | IS 3025 Part 34-1988 (Reaff. 2019)        | 1.12 mg/l            |
| 36    | Sulphide as H <sub>2</sub> S                           | IS 3025 Part 29-1986 (Reaff: 2019)        | BDL (DL:0.01 mg/l)   |
| 37    | Molybdenum as Mo                                       | IS 3025 Part 65:2014 (Reaff:2019)         | BDL (DL:0.02 mg/l)   |
| 38    | Total Arsenic as As                                    | IS 3025 Part 65:2014 (Reaff:2019)         | BDL (DL:0.005 mg/l)  |
| 39    | Total Suspended Solids                                 | IS 3025 Part 17 -1984 (Reaff:2017)        | 20 mg/l              |
|       | <b>Discipline:</b> Biological                          | <b>Group:</b> Water                       |                      |
| 40    | Total Coliform   | APHA 23 <sup>rd</sup> Edn. 2017:9221B     | 640 MPN/100ml        |
| 41    | <i>Escherichia coli</i>                                | APHA 23 <sup>rd</sup> Edn. 2017:9221F     | 150 MPN/100ml        |

\*\*\*\*\*End of Report\*\*\*\*\*



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Authorised Signatory

Name: Santhosh Kumar A  
Designation: Quality Manager

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## TEST REPORT

|                                |  |                              |            |
|--------------------------------|--|------------------------------|------------|
| <b>Report No</b>               | EHS360/TR/2022-23/020  | <b>Report Date</b>           | 06.06.2024 |
| <b>Site Location</b>           | <b>THIRU. N.T. SAISADA ROUGH STONE AND GRAVEL QUARRY</b><br>S.F.No.: 151(P) & 152/4, Extent: 2.28.40Ha, Kurumbapalayam Village, Sathiyamangalam Taluk, Erode District. |                              |            |
| <b>Sampling Method</b>         | SOP Method   | <b>Sample Drawn by</b>       | Laboratory |
| <b>Sample Name</b>             | Water  | <b>Sample Code</b>           | EHS360/020 |
| <b>Sample Description</b>      | Ground Water (WW-1)  | <b>Sample Collected Date</b> | 27.05.2024 |
| <b>Qty. of Sample Received</b> | 2 Litres   | <b>Sample Received On</b>    | 27.05.2024 |
| <b>Sample Condition</b>        | Fit for Analysis   | <b>Test Commenced On</b>     | 29.05.2024 |
| <b>Sampling Location</b>       | <b>Near Project Area</b>   |                              |            |

| S.No. | Parameters                            | Test Method                              | RESULTS           |
|-------|---------------------------------------|--|-------------------|
|       | <b>Discipline:</b> Chemical           |  |                   |
| 1     | Colour                                | IS 3025 Part 4:1983                      | 5                 |
| 2     | Odour                                 | IS 3025 Part 5:2018                      | Agreeable         |
| 3     | pH at 25°C                            | IS 3025 Part 11:1983                     | 6.89              |
| 4     | Conductivity @ 25°C                   | IS 3025 Part 14:2013                     | 910 µmhos/cm      |
| 5     | Turbidity                             | IS 3025 Part 10:1984                     | 1.1 NTU           |
| 6     | Total Dissolved Solids                | IS 3025 Part 16:1984                     | 538 mg/l          |
| 7     | Total Hardness as CaCO <sub>3</sub>   | IS 3025 Part 21:2009                     | 181.79 mg/l       |
| 8     | Calcium as Ca                         | IS 3025 Part 40:1991                     | 34.3 mg/l         |
| 9     | Magnesium as Mg                       | IS 3025 Part 46:1994                     | 23.4 mg/l         |
| 10    | Total Alkalinity as CaCO <sub>3</sub> | IS 3025 Part 23:1986                     | 172 mg/l          |
| 11    | Chloride as Cl                        | IS 3025 Part 32:1988                     | 110 mg/l          |
| 12    | Sulphate as SO <sub>4</sub>           | IS 3025 Part 24:1986                     | 65 mg/l           |
| 13    | Iron as Fe                            | IS 3025 Part 53:2003                     | 0.18 mg/l         |
| 14    | Residual Free Chlorine                | IS 3025 Part 26:1986                     | BDL (DL:0.1 mg/l) |
| 15    | Fluoride as F                         | APHA 23 <sup>rd</sup> Edn. 2017:4500 F,D | 0.21 mg/l         |
| 16    | Nitrate as NO <sub>3</sub>            | IS 3025 Part 34:1988                     | 4.54 mg/l         |

\*\*\*\*\*End of Report\*\*\*\*\*

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A 17  
Name: Santhosh Kumar A  
Designation: Quality Manager

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**TEST REPORT**

|                                |  |                              |            |
|--------------------------------|--|------------------------------|------------|
| <b>Report No</b>               | EHS360/TR/2022-23/ 020   | <b>Report Date</b>           | 06.06.2024 |
| <b>Site Location</b>           | <b>THIRU. N.T. SAISADA ROUGH STONE AND GRAVEL QUARRY</b><br>S.F.No.: 151(P) & 152/4, Extent: 2.28.40Ha, Kurumbapalayam Village, Sathiyamangalam Taluk, Erode District. |                              |            |
| <b>Sampling Method</b>         | SOP Method   | <b>Sample Drawn by</b>       | Laboratory |
| <b>Sample Name</b>             | Water  | <b>Sample Code</b>           | EHS360/020 |
| <b>Sample Description</b>      | Ground Water (WW-1)  | <b>Sample Collected Date</b> | 27.05.2024 |
| <b>Qty. of Sample Received</b> | 2 Litres   | <b>Sample Received On</b>    | 27.05.2024 |
| <b>Sample Condition</b>        | Fit for Analysis   | <b>Test Commenced On</b>     | 29.05.2024 |
| <b>Sampling Location</b>       | <b>Near Project Area</b>   |                              |            |

| S.No. | Parameters   | Test Method                            | RESULTS              |
|-------|--|--|----------------------|
| 17    | Copper as Cu   | IS 3025 Part 65:2014                   | BDL (DL:0.01 mg/l)   |
| 18    | Manganese as Mn  | IS 3025 Part 65:2014                   | BDL (DL:0.02 mg/l)   |
| 19    | Mercury as Hg  | USEPA 200.8                            | BDL (DL:0.0005 mg/l) |
| 20    | Cadmium as Cd  | IS 3025 Part 65:2014                   | BDL (DL:0.001 mg/l)  |
| 21    | Selenium as Se   | IS 3025 Part 65:2014                   | BDL (DL:0.005 mg/l)  |
| 22    | Aluminium as Al  | IS 3025 Part 65:2014 (Reaff:2019)      | BDL (DL:0.005 mg/l)  |
| 23    | Lead as Pb   | IS 3025 Part 65:2014 (Reaff:2019)      | BDL (DL:0.005 mg/l)  |
| 24    | Zinc as Zn   | IS 3025 Part 65:2014 (Reaff:2019)      | BDL(DL : 0.05 mg/l)  |
| 25    | Total Chromium as Cr                                   | IS 3025 Part 65:2014 (Reaff:2019)      | BDL(DL : 0.02 mg/l)  |
| 26    | Boron as B   | IS 3025 Part 65:2014 (Reaff:2019)      | BDL(DL : 0.05 mg/l)  |
| 27    | Mineral Oil  | IS 3025 Part 39-1991 (Reaff. 2019)     | BDL(DL : 0.01 mg/l)  |
| 28    | Phenolic compounds as C <sub>6</sub> H <sub>5</sub> OH | IS 3025 Part 43-1992(Reaff: 2019)      | BDL (DL:0.0005 mg/l) |
| 29    | Anionic Detergents (as MBAS)                           | IS 13428 – 2005 (Reaff:2019) (Annex K) | BDL (DL:0.01 mg/l)   |
| 30    | Cyanide as CN  | IS 3025 Part 27-1986 (Reaff. 2019)     | BDL (DL:0.01 mg/l)   |
| 31    | BOD @ 27°C for 3 days                                  | IS 3025 Part 44:1993 (Reaff:2019)      | BDL(DL:0.05 mg/l)    |
| 32    | Chemical Oxygen Demand                                 | IS 3025 Part 58:2006 (Reaff:2017)      | BDL (DL:0.01 mg/l)   |
| 33    | Dissolved Oxygen                                       | IS 3025 Part 38:1989 (Reaff:2019)      | BDL (DL:0.01 mg/l)   |
| 34    | Barium as Ba   | IS 3025 Part 65:2014 (Reaff:2019)      | BDL (DL:0.02 mg/l)   |
| 35    | Ammonia (as total ammonia-N)                           | IS 3025 Part 34-1988 (Reaff. 2019)     | BDL (DL:0.005 mg/l)  |
| 36    | Sulphide as H <sub>2</sub> S                           | IS 3025 Part 29-1986 (Reaff: 2019)     | BDL (DL:1.0 mg/l)    |
| 37    | Molybdenum as Mo                                       | IS 3025 Part 65:2014 (Reaff:2019)      | BDL (DL:0.01 mg/l)   |
| 38    | Total Arsenic as As                                    | IS 3025 Part 65:2014 (Reaff:2019)      | BDL (DL:0.02 mg/l)   |
| 39    | Total Suspended Solids                                 | IS 3025 Part 17 -1984 (Reaff:2017)     | BDL (DL:0.0005 mg/l) |
|       | <b>Discipline: Biological</b>                          | <b>Group: Water</b>                    |                      |
| 40    | Total Coliform   | APHA 23 <sup>rd</sup> Edn. 2017:9221B  | 150 MPN/100ml        |
| 41    | <i>Escherichia coli</i>                                | APHA 23 <sup>rd</sup> Edn. 2017:9221F  | < 1.8 MPN/100ml      |

Verified by



Authorised Signatory

Name: Santhosh Kumar A  
Designation : Quality Manager

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**TEST REPORT**

|                                |  |                              |            |
|--------------------------------|--|------------------------------|------------|
| <b>Report No</b>               | EHS360/TR/2022-23/ 021   | <b>Report Date</b>           | 06.06.2024 |
| <b>Site Location</b>           | <b>THIRU. N.T. SAISADA ROUGH STONE AND GRAVEL QUARRY</b><br>S.F.No.: 151(P) & 152/4, Extent: 2.28.40Ha, Kurumbapalayam Village, Sathiyamangalam Taluk, Erode District. |                              |            |
| <b>Sampling Method</b>         | SOP Method   | <b>Sample Drawn by</b>       | Laboratory |
| <b>Sample Name</b>             | Water  | <b>Sample Code</b>           | EHS360/021 |
| <b>Sample Description</b>      | Ground Water (WW-2)  | <b>Sample Collected Date</b> | 27.05.2024 |
| <b>Qty. of Sample Received</b> | 2 Litres   | <b>Sample Received On</b>    | 27.05.2024 |
| <b>Sample Condition</b>        | Fit for Analysis   | <b>Test Commenced On</b>     | 29.05.2024 |
| <b>Sampling Location</b>       | <b>Kuppandurai</b>   |                              |            |

| S.No.                       | Parameters                            | Test Method                              | RESULTS           |
|-----------------------------|---------------------------------------|--|-------------------|
| <b>Discipline: Chemical</b> |                                       |  |                   |
| 1                           | Colour                                | IS 3025 Part 4:1983                      | 5                 |
| 2                           | Odour                                 | IS 3025 Part 5:2018                      | Agreeable         |
| 3                           | pH at 25°C                            | IS 3025 Part 11:1983                     | 7.05              |
| 4                           | Conductivity @ 25°C                   | IS 3025 Part 14:2013                     | 919 µmhos/cm      |
| 5                           | Turbidity                             | IS 3025 Part 10:1984                     | 1.0 NTU           |
| 6                           | Total Dissolved Solids                | IS 3025 Part 16:1984                     | 542 mg/l          |
| 7                           | Total Hardness as CaCO <sub>3</sub>   | IS 3025 Part 21:2009                     | 191.76 mg/l       |
| 8                           | Calcium as Ca                         | IS 3025 Part 40:1991                     | 32.2 mg/l         |
| 9                           | Magnesium as Mg                       | IS 3025 Part 46:1994                     | 27.1 mg/l         |
| 10                          | Total Alkalinity as CaCO <sub>3</sub> | IS 3025 Part 23:1986                     | 173 mg/l          |
| 11                          | Chloride as Cl                        | IS 3025 Part 32:1988                     | 118 mg/l          |
| 12                          | Sulphate as SO <sub>4</sub>           | IS 3025 Part 24:1986                     | 62.5 mg/l         |
| 13                          | Iron as Fe                            | IS 3025 Part 53:2003                     | 0.22 mg/l         |
| 14                          | Residual Free Chlorine                | IS 3025 Part 26:1986                     | BDL (DL:0.1 mg/l) |
| 15                          | Fluoride as F                         | APHA 23 <sup>rd</sup> Edn. 2017:4500 F,D | 0.23 mg/l         |
| 16                          | Nitrate as NO <sub>3</sub>            | IS 3025 Part 34:1988                     | 4.2 mg/l          |

\*\*\*\*\*End of Report\*\*\*\*\*

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Name: Santhosh Kumar A  
Designation: Quality Manager

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## TEST REPORT

|                                |   |                              |            |
|--------------------------------|---|------------------------------|------------|
| <b>Report No</b>               | EHS360/TR/2022-23/ 021  | <b>Report Date</b>           | 06.06.2024 |
| <b>Site Location</b>           | <b>THIRU. N.T. SAISADA ROUGH STONE AND GRAVEL QUARRY</b><br>S.F.No.: 151(P) & 152/4, Extent: 2.28.40Ha, Kurumbapalayam Village,<br>Sathiyamangalam Taluk, Erode District. |                              |            |
| <b>Sampling Method</b>         | SOP Method  | <b>Sample Drawn by</b>       | Laboratory |
| <b>Sample Name</b>             | Water   | <b>Sample Code</b>           | EHS360/021 |
| <b>Sample Description</b>      | Ground Water (WW-2)   | <b>Sample Collected Date</b> | 27.05.2024 |
| <b>Qty. of Sample Received</b> | 2 Litres  | <b>Sample Received On</b>    | 27.05.2024 |
| <b>Sample Condition</b>        | Fit for Analysis  | <b>Test Commenced On</b>     | 29.05.2024 |
| <b>Sampling Location</b>       | Kuppandurai   |                              |            |

| S.No. | Parameters   | Test Method                            | RESULTS              |
|-------|--|--|----------------------|
| 17    | Copper as Cu   | IS 3025 Part 65:2014 (Reaff:2019)      | BDL (DL:0.01 mg/l)   |
| 18    | Manganese as Mn  | IS 3025 Part 65:2014 (Reaff:2019)      | BDL (DL:0.02 mg/l)   |
| 19    | Mercury as Hg  | USEPA 200.8                            | BDL (DL:0.0005 mg/l) |
| 20    | Cadmium as Cd  | IS 3025 Part 65:2014 (Reaff:2019)      | BDL (DL:0.001 mg/l)  |
| 21    | Selenium as Se   | IS 3025 Part 65:2014 (Reaff:2019)      | BDL (DL:0.005 mg/l)  |
| 22    | Aluminium as Al  | IS 3025 Part 65:2014 (Reaff:2019)      | BDL (DL:0.005 mg/l)  |
| 23    | Lead as Pb   | IS 3025 Part 65:2014 (Reaff:2019)      | BDL (DL:0.005 mg/l)  |
| 24    | Zinc as Zn   | IS 3025 Part 65:2014 (Reaff:2019)      | BDL(DL : 0.05 mg/l)  |
| 25    | Total Chromium as Cr                                   | IS 3025 Part 65:2014 (Reaff:2019)      | BDL(DL : 0.02 mg/l)  |
| 26    | Boron as B   | IS 3025 Part 65:2014 (Reaff:2019)      | BDL(DL : 0.05 mg/l)  |
| 27    | Mineral Oil  | IS 3025 Part 39-1991 (Reaff. 2019)     | BDL(DL : 0.01 mg/l)  |
| 28    | Phenolic compounds as C <sub>6</sub> H <sub>5</sub> OH | IS 3025 Part 43-1992(Reaff: 2019)      | BDL (DL:0.0005 mg/l) |
| 29    | Anionic Detergents (as MBAS)                           | IS 13428 – 2005 (Reaff:2019) (Annex K) | BDL (DL:0.01 mg/l)   |
| 30    | Cyanide as CN  | IS 3025 Part 27-1986 (Reaff. 2019)     | BDL (DL:0.01 mg/l)   |
| 31    | Barium as Ba   | IS 3025 Part 44:1993 (Reaff:2019)      | BDL(DL:0.05 mg/l)    |
| 32    | Ammonia (as total ammonia-N)                           | IS 3025 Part 58:2006 (Reaff:2017)      | BDL (DL:0.01 mg/l)   |
| 33    | Sulphide as H <sub>2</sub> S                           | IS 3025 Part 38:1989 (Reaff:2019)      | BDL (DL:0.01 mg/l)   |
| 34    | Molybdenum as Mo                                       | IS 3025 Part 65:2014 (Reaff:2019)      | BDL (DL:0.02 mg/l)   |
| 35    | Total Arsenic as As                                    | IS 3025 Part 34-1988 (Reaff. 2019)     | BDL (DL:0.005 mg/l)  |
| 36    | Total Suspended Solids                                 | IS 3025 Part 29-1986 (Reaff: 2019)     | BDL (DL:1.0 mg/l)    |
|       | <b>Discipline:</b> Biological                          | <b>Group:</b> Water                    |                      |
| 37    | Total Coliform   | APHA 23 <sup>rd</sup> Edn. 2017:9221B  | 120 MPN/100ml        |
| 38    | <i>Escherichia coli</i>                                | APHA 23 <sup>rd</sup> Edn. 2017:9221F  | < 1.8 MPN/100ml      |

\*\*\*\*\*End of Report\*\*\*\*\*

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A S K

Name: Santhosh Kumar A  
Designation: Quality Manager

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**TEST REPORT**

|                                |  |                              |            |
|--------------------------------|--|------------------------------|------------|
| <b>Report No</b>               | EHS360/TR/2022-23/ 022   | <b>Report Date</b>           | 06.06.2024 |
| <b>Site Location</b>           | <b>THIRU. N.T. SAISADA ROUGH STONE AND GRAVEL QUARRY</b><br>S.F.No.: 151(P) & 152/4, Extent: 2.28.40Ha, Kurumbapalayam Village, Sathiyamangalam Taluk, Erode District. |                              |            |
| <b>Sampling Method</b>         | SOP Method   | <b>Sample Drawn by</b>       | Laboratory |
| <b>Sample Name</b>             | Water  | <b>Sample Code</b>           | EHS360/022 |
| <b>Sample Description</b>      | Ground Water (BW-1)  | <b>Sample Collected Date</b> | 27.05.2024 |
| <b>Qty. of Sample Received</b> | 2 Litres   | <b>Sample Received On</b>    | 27.05.2024 |
| <b>Sample Condition</b>        | Fit for Analysis   | <b>Test Commenced On</b>     | 29.05.2024 |
| <b>Sampling Location</b>       | Near Project Area  |                              |            |

| S.No                        | Parameters                            | Test Method                              | RESULTS           |
|-----------------------------|---------------------------------------|--|-------------------|
| <b>Discipline: Chemical</b> |                                       |  |                   |
| 1                           | Colour                                | IS 3025 Part 4:1983                      | 5                 |
| 2                           | Odour                                 | IS 3025 Part 5:2018                      | Agreeable         |
| 3                           | pH at 25°C                            | IS 3025 Part 11:1983                     | 7.51              |
| 4                           | Conductivity @ 25°C                   | IS 3025 Part 14:2013                     | 780 µmhos/cm      |
| 5                           | Turbidity                             | IS 3025 Part 10:1984                     | 1.0 NTU           |
| 6                           | Total Dissolved Solids                | IS 3025 Part 16:1984                     | 460 mg/l          |
| 7                           | Total Hardness as CaCO <sub>3</sub>   | IS 3025 Part 21:2009                     | 166.15 mg/l       |
| 8                           | Calcium as Ca                         | IS 3025 Part 40:1991                     | 28.2 mg/l         |
| 9                           | Magnesium as Mg                       | IS 3025 Part 46:1994                     | 23.3 mg/l         |
| 10                          | Total Alkalinity as CaCO <sub>3</sub> | IS 3025 Part 23:1986                     | 140 mg/l          |
| 11                          | Chloride as Cl                        | IS 3025 Part 32:1988                     | 81.1 mg/l         |
| 12                          | Sulphate as SO <sub>4</sub>           | IS 3025 Part 24:1986                     | 55.5 mg/l         |
| 13                          | Iron as Fe                            | IS 3025 Part 53:2003                     | 0.11 mg/l         |
| 14                          | Residual Free Chlorine                | IS 3025 Part 26:1986                     | BDL (DL:0.1 mg/l) |
| 15                          | Fluoride as F                         | APHA 23 <sup>rd</sup> Edn. 2017:4500 F,D | 0.31 mg/l         |
| 16                          | Nitrate as NO <sub>3</sub>            | IS 3025 Part 34:1988                     | 5.12 mg/l         |

\*\*\*\*\*End of Report\*\*\*\*\*

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Name: Santhosh Kumar A  
Designation: Quality Manager

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## TEST REPORT

|                                |  |                              |            |
|--------------------------------|--|------------------------------|------------|
| <b>Report No</b>               | EHS360/TR/2022-23/ 022   | <b>Report Date</b>           | 06.06.2024 |
| <b>Site Location</b>           | THIRU. N.T. SAISADA ROUGH STONE AND GRAVEL QUARRY<br>S.F.No.: 151(P) & 152/4, Extent: 2.28.40Ha, Kurumbapalayam Village,<br>Sathiyamangalam Taluk, Erode District. |                              |            |
| <b>Sampling Method</b>         | SOP Method   | <b>Sample Drawn by</b>       | Laboratory |
| <b>Sample Name</b>             | Water  | <b>Sample Code</b>           | EHS360/022 |
| <b>Sample Description</b>      | Ground Water (BW-1)  | <b>Sample Collected Date</b> | 27.05.2024 |
| <b>Qty. of Sample Received</b> | 2 Litres   | <b>Sample Received On</b>    | 27.05.2024 |
| <b>Sample Condition</b>        | Fit for Analysis   | <b>Test Commenced On</b>     | 29.05.2024 |
| <b>Sampling Location</b>       | Near Project Area  |                              |            |

| S.No. | Parameters   | Test Method                               | RESULTS              |
|-------|--|---|----------------------|
| 17    | Copper as Cu   | IS 3025 Part 65:2014 (Reaff:2019)         | BDL (DL:0.01 mg/l)   |
| 18    | Manganese as Mn  | IS 3025 Part 65:2014 (Reaff:2019)         | BDL (DL:0.02 mg/l)   |
| 19    | Mercury as Hg  | USEPA 200.8                               | BDL (DL:0.0005 mg/l) |
| 20    | Cadmium as Cd  | IS 3025 Part 65:2014 (Reaff:2019)         | BDL (DL:0.001 mg/l)  |
| 21    | Selenium as Se   | IS 3025 Part 65:2014 (Reaff:2019)         | BDL (DL:0.005 mg/l)  |
| 22    | Aluminium as Al  | IS 3025 Part 65:2014 (Reaff:2019)         | BDL (DL:0.005 mg/l)  |
| 23    | Lead as Pb   | IS 3025 Part 65:2014 (Reaff:2019)         | BDL (DL:0.005 mg/l)  |
| 24    | Zinc as Zn   | IS 3025 Part 65:2014 (Reaff:2019)         | BDL(DL : 0.05 mg/l)  |
| 25    | Total Chromium as Cr                                   | IS 3025 Part 65:2014 (Reaff:2019)         | BDL(DL : 0.02 mg/l)  |
| 26    | Boron as B   | IS 3025 Part 65:2014 (Reaff:2019)         | BDL(DL : 0.05 mg/l)  |
| 27    | Mineral Oil  | IS 3025 Part 39-1991 (Reaff. 2019)        | BDL(DL : 0.01 mg/l)  |
| 28    | Phenolic compounds as C <sub>6</sub> H <sub>5</sub> OH | IS 3025 Part 43-1992(Reaff: 2019)         | BDL (DL:0.0005 mg/l) |
| 29    | Anionic Detergents (as MBAS)                           | IS 13428 – 2005 (Reaff:2019)<br>(Annex K) | BDL (DL:0.01 mg/l)   |
| 30    | Cyanide as CN  | IS 3025 Part 27-1986 (Reaff. 2019)        | BDL (DL:0.01 mg/l)   |
| 31    | Barium as Ba   | IS 3025 Part 44:1993 (Reaff:2019)         | BDL(DL:0.05 mg/l)    |
| 32    | Ammonia (as total ammonia-N)                           | IS 3025 Part 58:2006 (Reaff:2017)         | BDL (DL:0.01 mg/l)   |
| 33    | Sulphide as H <sub>2</sub> S                           | IS 3025 Part 38:1989 (Reaff:2019)         | BDL (DL:0.01 mg/l)   |
| 34    | Molybdenum as Mo                                       | IS 3025 Part 65:2014 (Reaff:2019)         | BDL (DL:0.02 mg/l)   |
| 35    | Total Arsenic as As                                    | IS 3025 Part 34-1988 (Reaff. 2019)        | BDL (DL:0.005 mg/l)  |
| 36    | Total Suspended Solids                                 | IS 3025 Part 29-1986 (Reaff: 2019)        | BDL (DL:1.0 mg/l)    |
|       | <b>Discipline: Biological</b>                          | <b>Group: Water</b>                       |                      |
| 37    | Total Coliform   | APHA 23 <sup>rd</sup> Edn. 2017:9221B     | 146 MPN/100ml        |
| 38    | <i>Escherichia coli</i>                                | APHA 23 <sup>rd</sup> Edn. 2017:9221F     | < 1.8 MPN/100ml      |

\*\*\*\*\*End of Report\*\*\*\*\*

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A S K  
Name: Santhosh Kumar A  
Designation: Quality Manager

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**TEST REPORT**

|                                |   |                              |            |
|--------------------------------|---|------------------------------|------------|
| <b>Report No</b>               | EHS360/TR/2022-23/ 023  | <b>Report Date</b>           | 06.06.2024 |
| <b>Site Location</b>           | <b>THIRU. N.T. SAISADA ROUGH STONE AND GRAVEL QUARRY</b><br>S.F.No.: 151(P) & 152/4, Extent: 2.28.40Ha, Kurumbapalayam Village,<br>Sathiyamangalam Taluk, Erode District. |                              |            |
| <b>Sampling Method</b>         | SOP Method  | <b>Sample Drawn by</b>       | Laboratory |
| <b>Sample Name</b>             | Water   | <b>Sample Code</b>           | EHS360/023 |
| <b>Sample Description</b>      | Ground Water (BW-2)   | <b>Sample Collected Date</b> | 27.05.2024 |
| <b>Qty. of Sample Received</b> | 2 Litres  | <b>Sample Received On</b>    | 27.05.2024 |
| <b>Sample Condition</b>        | Fit for Analysis  | <b>Test Commenced On</b>     | 29.05.2024 |
| <b>Sampling Location</b>       | Mayilampatti  |                              |            |

| S.No.                       | Parameters                            | Test Method                              | RESULTS           |
|-----------------------------|---------------------------------------|--|-------------------|
| <b>Discipline:</b> Chemical |                                       |  |                   |
| 1                           | Colour                                | IS 3025 Part 4:1983                      | 5                 |
| 2                           | Odour                                 | IS 3025 Part 5:2018                      | Agreeable         |
| 3                           | pH at 25°C                            | IS 3025 Part 11:1983                     | 7.12              |
| 4                           | Conductivity @ 25°C                   | IS 3025 Part 14:2013                     | 988 µmhos/cm      |
| 5                           | Turbidity                             | IS 3025 Part 10:1984                     | 1.0 NTU           |
| 6                           | Total Dissolved Solids                | IS 3025 Part 16:1984                     | 583 mg/l          |
| 7                           | Total Hardness as CaCO <sub>3</sub>   | IS 3025 Part 21:2009                     | 189.20 mg/l       |
| 8                           | Calcium as Ca                         | IS 3025 Part 40:1991                     | 31.5 mg/l         |
| 9                           | Magnesium as Mg                       | IS 3025 Part 46:1994                     | 26.9 mg/l         |
| 10                          | Total Alkalinity as CaCO <sub>3</sub> | IS 3025 Part 23:1986                     | 195 mg/l          |
| 11                          | Chloride as Cl                        | IS 3025 Part 32:1988                     | 130 mg/l          |
| 12                          | Sulphate as SO <sub>4</sub>           | IS 3025 Part 24:1986                     | 66.5 mg/l         |
| 13                          | Iron as Fe                            | IS 3025 Part 53:2003                     | 0.37 mg/l         |
| 14                          | Residual Free Chlorine                | IS 3025 Part 26:1986                     | BDL (DL:0.1 mg/l) |
| 15                          | Fluoride as F                         | APHA 23 <sup>rd</sup> Edn. 2017:4500 F,D | 0.26 mg/l         |
| 16                          | Nitrate as NO <sub>3</sub>            | IS 3025 Part 34:1988                     | 5.1 mg/l          |

\*\*\*\*\*End of Report\*\*\*\*\*

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Name: Santhosh Kumar A  
Designation: Quality Manager

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**TEST REPORT**

|                                |   |                              |            |
|--------------------------------|---|------------------------------|------------|
| <b>Report No</b>               | EHS360/TR/2022-23/ 023  | <b>Report Date</b>           | 06.06.2024 |
| <b>Site Location</b>           | <b>THIRU. N.T. SAISADA ROUGH STONE AND GRAVEL QUARRY</b><br>S.F.No.: 151(P) & 152/4, Extent: 2.28.40Ha, Kurumbapalayam Village,<br>Sathiyamangalam Taluk, Erode District. |                              |            |
| <b>Sampling Method</b>         | SOP Method  | <b>Sample Drawn by</b>       | Laboratory |
| <b>Sample Name</b>             | Water   | <b>Sample Code</b>           | EHS360/023 |
| <b>Sample Description</b>      | Ground Water (BW-2)   | <b>Sample Collected Date</b> | 27.05.2024 |
| <b>Qty. of Sample Received</b> | 2 Litres  | <b>Sample Received On</b>    | 27.05.2024 |
| <b>Sample Condition</b>        | Fit for Analysis  | <b>Test Commenced On</b>     | 29.05.2024 |
| <b>Sampling Location</b>       | <b>Mayilampatti</b>   |                              |            |

| S.No. | Parameters   | Test Method                            | RESULTS              |
|-------|--|--|----------------------|
| 17    | Copper as Cu   | IS 3025 Part 65:2014 (Reaff:2019)      | BDL (DL:0.01 mg/l)   |
| 18    | Manganese as Mn  | IS 3025 Part 65:2014 (Reaff:2019)      | BDL (DL:0.02 mg/l)   |
| 19    | Mercury as Hg  | USEPA 200.8                            | BDL (DL:0.0005 mg/l) |
| 20    | Cadmium as Cd  | IS 3025 Part 65:2014 (Reaff:2019)      | BDL (DL:0.001 mg/l)  |
| 21    | Selenium as Se   | IS 3025 Part 65:2014 (Reaff:2019)      | BDL (DL:0.005 mg/l)  |
| 22    | Aluminium as Al  | IS 3025 Part 65:2014 (Reaff:2019)      | BDL (DL:0.005 mg/l)  |
| 23    | Lead as Pb   | IS 3025 Part 65:2014 (Reaff:2019)      | BDL (DL:0.005 mg/l)  |
| 24    | Zinc as Zn   | IS 3025 Part 65:2014 (Reaff:2019)      | BDL(DL : 0.05 mg/l)  |
| 25    | Total Chromium as Cr                                   | IS 3025 Part 65:2014 (Reaff:2019)      | BDL(DL : 0.02 mg/l)  |
| 26    | Boron as B   | IS 3025 Part 65:2014 (Reaff:2019)      | BDL(DL : 0.05 mg/l)  |
| 27    | Mineral Oil  | IS 3025 Part 39-1991 (Reaff. 2019)     | BDL(DL : 0.01 mg/l)  |
| 28    | Phenolic compounds as C <sub>6</sub> H <sub>5</sub> OH | IS 3025 Part 43-1992(Reaff: 2019)      | BDL (DL:0.0005 mg/l) |
| 29    | Anionic Detergents (as MBAS)                           | IS 13428 – 2005 (Reaff:2019) (Annex K) | BDL (DL:0.01 mg/l)   |
| 30    | Cyanide as CN  | IS 3025 Part 27-1986 (Reaff. 2019)     | BDL (DL:0.01 mg/l)   |
| 31    | Barium as Ba   | IS 3025 Part 44:1993 (Reaff:2019)      | BDL(DL:0.05 mg/l)    |
| 32    | Ammonia (as total ammonia-N)                           | IS 3025 Part 58:2006 (Reaff:2017)      | BDL (DL:0.01 mg/l)   |
| 33    | Sulphide as H <sub>2</sub> S                           | IS 3025 Part 38:1989 (Reaff:2019)      | BDL (DL:0.01 mg/l)   |
| 34    | Molybdenum as Mo                                       | IS 3025 Part 65:2014 (Reaff:2019)      | BDL (DL:0.02 mg/l)   |
| 35    | Total Arsenic as As                                    | IS 3025 Part 34-1988 (Reaff. 2019)     | BDL (DL:0.005 mg/l)  |
| 36    | Total Suspended Solids                                 | IS 3025 Part 29-1986 (Reaff: 2019)     | BDL (DL:1.0 mg/l)    |
|       | <b>Discipline:</b> Biological                          | <b>Group:</b> Water                    |                      |
| 37    | Total Coliform   | APHA 23 <sup>rd</sup> Edn. 2017:9221B  | 138 MPN/100ml        |
| 38    | <i>Escherichia coli</i>                                | APHA 23 <sup>rd</sup> Edn. 2017:9221F  | < 1.8 MPN/100ml      |

\*\*\*\*\*End of Report\*\*\*\*\*



Verified by

*[Signature]*

Authorised Signatory

*[Signature]*  
Name: Santhosh Kumar A  
Designation: Quality Manager

Note: 1. The test results are only to the sample submitted for test. 2. Any correction of the test report in full or part shall invalidate the report. 3. Sample will be retained for 15 days from the date of reporting except in case of regulatory samples or specifically instructed by client. 4. Perishable samples will be discarded immediately after reporting. 5. Under no circumstance's lab accepts any liability or loss/damage caused by use or misuse of test report after invoicing or issued of test report.



## National Accreditation Board for Education and Training



# Certificate of Accreditation

### Geo Exploration & Mining Solutions, Salem

No. 17, Advaita Ashram Road, Fairlands, Salem – 636 004, Tamilnadu, India.

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 opencast only  | 1               | 1 (a) (i) | A    |
| 2    | Industrial estates/ parks/ complexes/areas, export processing Zones (EPZs), Special Economic Zones (SEZs), Biotech Parks, Leather Complexes | 31              | 7 (c)     | B    |
| 3    | Building and construction projects  | 38              | 8(a)      | B    |

**Note: Names of approved EIA Coordinators and Functional Area Experts are mentioned in RAAC minutes dated Jan 06, 2023 and posted on QCI-NABET website.**

The Accreditation shall remain in force subject to continued compliance to the terms and conditions mentioned in QCI-NABET's letter of accreditation bearing no QCI/NABET/ENV/ACO/23/2684 dated Feb 20, 2023. The accreditation needs to be renewed before the expiry date by Geo Exploration & Mining Solutions, Salem following due process of assessment.

Sr. Director, NABET  
Dated: Feb 20, 2023

Certificate No.  
NABET/EIA/2225/RA 0276

Valid up to  
August 06, 2025

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

