DRAFT EIA & EMP FOR
PROPOSED ROUGH STONE AND GRAVEL QUARRY
CATEGORY – B1

(Public Hearing Upgraded after Terms of Reference (ToR) as per the provisions of EIA Notification 2006 & amendments thereof)

ToR Lr.No.SEIAA-TN/F.No.9971/SEAC/ToR- 1495/2023, Dated 22.06.2023

PROPOSED QUARRY LEASE DETAILS	
SURVEY NOS	253/7, 259/5, 259/2 & 259/4
VILLAGE	KARADIKUDI
TALUK	ANAICUT
DISTRICT	VELLORE
EXTENT	2.31.5 HA
PROPOSED PRODUCTION QUANTITY (FIVE YEARS)	ROUGH STONE : 2,08,760 m^3 GRAVEL : 34,184 m^3 DEPTH: 32m (17m AGL + 15m BGL)
LAND	PATTA LAND

(Sector No. 1(a) Sector No.1 as per NABET)
Category of the Project: B1 Cluster Mining, Total Cluster Area – 10.33.5 Ha
Baseline Monitoring Period – October to December 2023

APPLICANT

THIRU.R. NATARAJAN

S/O. RANGASAMY

NO.147, AYYAGOUNDARPATTI,

KOLLAMANGALAM VILLAGE, GUDIYATHAM TALUK,

VELLORE DISTRICT, PIN CODE– 635809.

ORGANIZATION

M/s. GLOBAL MINING SOLUTIONS

(NABET ACCREDITED & ISO 9001 CERTIFIED CONSULTANT)

PLOT NO. 6, SF NO. 13/2, A2, VS CITY, RC CHETTYPATTY,

KOTTAMETTUPATTY, OMALUR, SALEM, TAMIL NADU – 636 455

NABET ACCREDITATION NO – NABET/EIA/2326/IA 0110

CONTACT: 97502 23535, 94446 54520

Email: infoglobalmining@gmail.com, globalminingsolutionssalem@gmail.com

OCTOBER- 2024

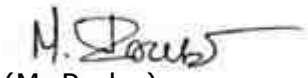
AMENDMENT PAGE

SL	Page No.	Section / Clause / Para / Line (as Applicable)	Date of Amendment	Amendment Made	Reasons of amendment	Signature of Person Authorizing Amendment
1						
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ACKNOWLEDGEMENT

M/s. Global Mining Solutions, Salem is very much thankful to Thiru.R.Natarajan, Lessee for the confidence and trust placed on the organization for carrying out Environmental Impact Assessment (EIA) study for the proposed Rough Stone and Gravel quarry over a lease extent of 2.31.50 Ha, & Cluster extent of 10.33.5 Ha., located at Karadikudi Village, Anaicut Taluk, Vellore District, Tamil Nadu State and formulating the Environmental Management Plan (EMP). We also gratefully acknowledge the cooperation and assistance provided by concerned government authorities for collection of secondary information for the preparation of Draft EIA/EMP report. Our sincere thanks to the local people of Karadikudi Village and the nearby villages for their whole hearted cooperation and constant involvement during the entire field study without which the study would not have been possible.

For: M/s. Global Mining Solutions



(M. Prabu)

Managing Director

UNDERTAKING

In line with MoEF OM No. J – 11013/41/2006-IA.II (I) dated 5th October 2011, we hereby give our undertaking for owning the content and information in the EIA/EMP report submitted for EC of the proposed Rough Stone and Gravel quarry over a lease extent of 2.31.50 Ha, & Cluster extent of 10.33.5 Ha, located at Karadikudi Village, Anaicut Taluk, Vellore District, Tamil Nadu State.

For: M/s. Global Mining Solutions



Name: M. Manikandan
EIA Coordinator – Mining of Minerals
M/s. Global Mining Solutions

UNDERTAKING

In Line with OM no. J-11013/41/2006-IA.II (1) dated 4th Aug 2009 and its Amendments, we hereby confirm that all Terms of Reference issued by Ministry of Environment, Forest and Climate Change vide ToR Lr.No.SEIAA-TN/F.No.9971/SEAC/ToR- 1495/2023, Dated 22.06.2023 of Draft EIA/EMP report for the proposed Stone Quarry over a lease extent of 2.31.50 Ha, & Cluster extent of 10.33.5 Ha., located at Karadikudi Village, Anaicut Taluk, Vellore District, Tamil Nadu State for the production of 2,08,760 m^3 of Rough Stone and 34,184 m^3 of Gravel formation from the proposed lease area and the details has been complied in the Draft EIA/EMP report is factually correct.

The EIA/EMP report has been prepared by M/s. Global Mining Solutions (GMS), Salem. GMS is a NABET accredited consultant for preparation of EIA/EMP report of Mining of Minerals (Opencast only) vide certificate No. NABET/EIA/2326/IA 0110, valid till 04.01.2026.

For: M/s. Global Mining Solutions



Name: M. Manikandan
EIA Coordinator – Mining of Minerals
M/s. Global Mining Solutions

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National Accreditation Board for Education and Training

Certificate of Accreditation

Global Mining Solutions

Plot No - 6 SF No 13/2 A2, VS City, RC Chettypatty,
Kottamettupatty, Omalur, Salem, Tamil Nadu-636455

*The organization is accredited as **Category-B** under the QCI-NABET Scheme for Accreditation of EIA Consultant Organizations, 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 mining only	1	1 (a) (i)	A

Note: Names of approved EIA Coordinators and Functional Area Experts are mentioned in IAAC minutes dated February 10, 2023, posted on the QCI-NABET website.

The Accreditation shall remain in force subject to continued compliance with the terms and conditions mentioned in QCI-NABET's letter of accreditation bearing no. QCI/NABET/ENV/ACO/23/2724 dated March 31, 2023. The accreditation needs to be renewed before the expiry date by Global Mining Solutions, Salem following the due process of assessment.

Sr. Director, NABET
Date: March 31, 2023

Certificate No.
NABET/EIA/2326/IA 0110

Valid up to
January 4, 2026

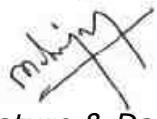
For the updated List of Accredited EIA Consultant Organizations with approved Sectors please refer to the QCI-NABET website.

Declaration by Experts

Declaration by Experts contributing to the proposed Stone Quarry over a lease extent of 2.31.50 Ha, & Cluster extent of 10.33.5 Ha, located at Karadikudi Village, Anaicut Taluk, Vellore District, Tamil Nadu State.

I, hereby, certify that I was a part of the EIA team that developed the above EIA.

EIA Coordinator Name: M. Manikandan

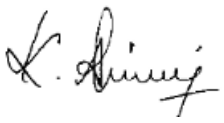


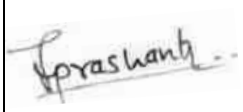
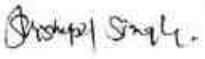
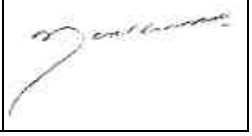
Signature & Date

Period of involvement: Oct 2023 to Dec 2023.

Contact information:

M/s Global Mining Solutions
Plot No.6, SF No. 13/2, A2, VS City, RC Chettypatty,
Kottamettupatty, Omalur,
Salem, Tamil Nadu – 636 455

S. No.	Functional areas	Name of the expert/s	Involvement (period and task**)	Signature and Date
1	*AP*	*Dhanalakshmi Ramanathan*	*Assessment of existing air quality, Impact of the project on ambient air and suggested mitigation measures for air pollution.* *Period: Oct 2023 to Dec 2023.*	
2	*WP*	*Abirami Kaliaperumal*	*Assessment of existing water quality, impact of the project on surface and ground water quality, suggested mitigation measures for minimizing the impact.* *Period: Oct 2023 to Dec 2023.*	
3	*SHW*	*Ramadoss N*	*Assessment of waste generated from the project, suggested waste management practices.* *Period: Oct 2023 to Dec 2023.*	
4	*SE*	*Saraswathy K*	*Baseline SE studies. Data compilation and assessment. Impact of the project on SE status of the area. Formulation of CER plan.* *Period: Oct 2023 to Dec 2023.*	
5	*EB*	*Saravanan S*	*Baseline data collection of related to ecology of the area.* *Period: Oct 2023 to Dec 2023.*	
6	*HG*	*Ravinthiran N*	*Hydrogeological feature of the area. Ground water depth and impact of project on ground water of the area.* *Period: Oct 2023 to Dec 2023.*	
7	*AQ*	*Srilatha Thiruveedhula*	*Air quality modeling utilizing the area source model. Predication of the ground level concentration of the dust. Suggesting suitable mitigation measures.* *Period: Oct 2023 to Dec 2023.*	
8	*NV*	*Dhanalakshmi Ramanathan*	*Ambient noise study of the area. Incremental noise generation due to quarry operation and impact of the noise due to the project.* *Period: Oct 2023 to Dec 2023.*	
9	*LU*	*Srilatha Thiruveedhula*	*Preparation of land use map based on satellite imagery. Land use classification and analysis. Impact*	

			prediction of the project on the surrounding land environment. *<u>Period: Oct 2023 to Dec 2023.</u>*	
10	*RH*	*S.V. Prashant*	*Identification of the Risk related to the mining activities. Preparation of emergency disaster management plan. Plan for supply of safety equipment for the worker.* *<u>Period: Oct 2023 to Dec 2023.</u>*	
11	*SC*	*Shisu Pal Singh*	*Soil monitoring, secondary data collection on soil type, soil management practices, utilization of topsoil.* *<u>Period: Oct 2023 to Dec 2023.</u>*	
12	*GEO*	*Valliappan Meyyappan*	*Geological map, stability of quarry and dump, management plan for mine stability, after use of mining quarry and geological feature of the area.* *<u>Period: Oct 2023 to Dec 2023.</u>*	

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COMPLIANCE TO TERMS OF REFERENCE

THIRU.DEEPAK S.BILGI, I.F.S.
MEMBER SECRETARY

STATE LEVEL ENVIRONMENT IMPACT ASSESSMENT AUTHORITY-TAMILNADU
3rd Floor, Panagal Maaligai,
No.1, Jeenis Road, Saidapet,
Chennai - 600 015.
Phone No. 044-24359973
Fax No. 044-24359975

TERMS OF REFERENCE (ToR)

Lr No.SEIAA-TN/F.No.9971/SEAC/ToR- 1495/2023 Dated:22.06.2023.

To

Thiru.R.Natarajan,
S/o.Rangasamy,
147, Ayyagoundarpatti,
Kollamangalam Village,
Gudiyatham Taluk,
Vellore District-638509

Sir / Madam,

Sub: SEIAA, Tamil Nadu – Terms of Reference with public Hearing (ToR) for the Proposed Rough stone & Gravel Quarry over an extent of 2.31.50Ha in SF.No. 253/7, 259/5, 259/2 & 259/4 at Karadikudi Village, Anaicut Taluk, Vellore District, Tamil Nadu by Thiru.R.Natarajan - under project category – "B1" and Schedule S.No.1 (a) – ToR issued along with Public Hearing - preparation of EIA report – Regarding.

Ref: 1. Online proposal No. SIA/TN/MIN/424208/2023, dated:31.03.2023.
2. Your application submitted for Terms of Reference dated:10.04.2023.
4. Minutes of the 382nd SEAC meeting held on 09.06.2023.
5 Minutes of the 632nd SEIAA meeting held on 21.06.2023 & 22.06.2023.

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

The proponent, Thiru.R.Natarajan has submitted application for Terms of Reference (ToR) in Form-I, Pre- Feasibility report for Proposed Rough stone & Gravel Quarry over an extent of 2.31.50Ha

MEMBER SECRETARY
SEIAA-TN

Page 1 of 23

in SF.No. 253/7, 259/5, 259/2 & 259/4 at Karadikudi Village, Anaicut Taluk, Vellore District, Tamil Nadu.

Discussion by SEAC and the Remarks:-

Proposed Rough stone & Gravel Quarry over an extent of 2.31.50Ha in SF.No. 253/7, 259/5, 259/2 & 259/4 at Karadikudi Village, Anaicut Taluk, Vellore District, Tamil Nadu by Thiru.R.Natarajan - For Terms of Reference.

(SIA/TN/MIN/424208/2023, Dt. 31.03.2023)

The proposal was placed in the 382nd SEAC Meeting held on 09.06.2023. The details of the project furnished by the proponent are given on the website (parivesh.nic.in).

The SEAC noted the following:

1. The Project Proponent, Thiru.R.Natarajan has applied for Terms of Reference for the Proposed Rough stone & Gravel Quarry over an extent of 2.31.50Ha in SF.No. 253/7, 259/5, 259/2 & 259/4 of Karadikudi Village, Anaicut Taluk, Vellore District,Tamil Nadu.
2. The project/activity is covered under Category "B1" of Item 1(a) " Mining of mineral of the Schedule to the EIA Notification, 2006.
3. As per the mining plan the lease period is 5 years. The mining plan is for the period of Five years & the production should not exceed 2,08,760m^3 of rough stone & 34,184m^3 of Gravel with an ultimate depth of mining 32m (17m AGL + 15m BGL) (2m Gravel + 30m Rough stone). The annual peak production is 42,600m^3 of rough stone (3rd Year) & 17,940m^3 of Gravel (2nd Year).

Based on the presentation made by the proponent, **SEAC decided to recommend for grant of Terms of Reference (TOR) with Public Hearing,** subject to the following TORs, in addition to the standard terms of reference for EIA study for non-coal mining projects and details issued by the MOEF & CC to be included in EIA/EMP Report:

1. The proponent is requested to carry out a survey and enumerate on the structures located within 50m, 100m, 150m, 200m, 250m, 300m and 500m from the boundary of the mine lease area.
2. The proponent shall discuss the funds for mitigation measures to be included in the EMP.
3. The proponent shall adhere to the bench height - 5m as stated in the approved mining plan.
4. The PP shall frame Environmental policy and shall appoint Environmental Manger etc.,

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5. The Project Proponent shall conduct the hydro-geological study considering the contour map of the water table detailing the number of ground water pumping & open wells, and surface water bodies such as rivers, tanks, canals, ponds etc. within 1 km (radius) along with the collected water level data for both monsoon and non-monsoon seasons from the PWD / TWAD so as to assess the impacts on the wells due to mining activity. Necessary data and documentation in this regard may be provided.
6. The PP shall spell out 'a 'Slope Stability Action Plan' for the proposed quarry covering the existing condition of the quarry wall including the overall pit slope angle where the proposed depth exceeds 30 m and it shall cover the aspects of stability of quarry walls including the access ramp keeping the benches intact.
7. If the blasting operation is to be carried out, the PP shall present a conceptual design for carrying out the NONEL initiation based controlled blasting operation including the line drilling & muffle blasting techniques and a Simulation Model indicating the anticipated Blast-induced Ground Vibration levels in the proposed quarry as stipulated by the DGMS Circular No.7 of 1997, during the EIA Proposal.
8. The PP shall furnish DFO letter stating that the proximity distance of Reserve Forests, Protected Areas, Sanctuaries, Tiger reserve etc., upto a radius of 25 km from the proposed site.
9. The PP shall provide individual notice regarding the Public Hearing to the nearby house owners located in the vicinity of the project site.
10. In the case of proposed lease in an existing (or old) quarry where the benches are non-existent (or) partially formed critical of the bench geometry approved in the Mining Plan, the Project Proponent (PP) shall prepare and submit an 'Action Plan' for carrying out the realignment of the 'highwall' benches to ensure slope stability in the proposed quarry lease which shall be vetted by the concerned Asst. Director of Geology and Mining, during the time of appraisal for obtaining the EC.
11. 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.
12. Since the quarry lies in a cluster situation, the PP shall furnish a Standard Operating Procedure for carrying out the safe blasting operation while considering the adjacent quarries lies in a radial distance of 500 m from their quarry.

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13. Details of Green belt & fencing shall be included in the EIA Report.
14. 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.
15. 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,

    - What was the period of the operation and stoppage of the earlier mines with last work permit issued by the AD/DD mines?
    - Quantity of minerals mined out.
    - Highest production achieved in any one year
    - Detail of approved depth of mining.
    - Actual depth of the mining achieved earlier.
    - Name of the person already mined in that leases area.
    - If EC and CTO already obtained, the copy of the same shall be submitted.
    - Whether the mining was carried out as per the approved mine plan (or EC if issued) with stipulated benches.

16. 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).
17. The PP shall carry out Drone video survey covering the cluster, Green belt , fencing etc.,
18. 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.
19. 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.

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20. The Project Proponent shall provide the Organization chart indicating the appointment of various statutory officials and other competent persons to be appointed as per the provisions of Mines Act'1952 and the MMR, 1961 for carrying out the quarrying operations scientifically and systematically in order to ensure safety and to protect the environment.
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.
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.
23. Rain water harvesting management with recharging details along with water balance (both monsoon & non-monsoon) be submitted.
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.
25. Details of the land for storage of Overburden/Waste Dumps (or) Rejects outside the mine lease, such as extent of land area, distance from mine lease, its land use, R&R issues, if any, should be provided.
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.
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.
28. Impact on local transport infrastructure due to the Project should be indicated.

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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.
30. A detailed mine closure plan for the proposed project shall be included in EIA/EMP report which should be site-specific.
31. Public Hearing points raised and commitments of the Project Proponent on the same along with time bound Action Plan with budgetary provisions to implement the same should be provided and also incorporated in the final EIA/EMP Report of the Project and to be submitted to SEIAA/SEAC with regard to the Office Memorandum of MoEF& CC accordingly.
32. The Public hearing advertisement shall be published in one major National daily and one most circulated vernacular daily.
33. The PP shall produce/display the EIA report, Executive summery and other related information with respect to public hearing in Tamil Language also.
34. 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.
35. 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-IIn 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.
36. Taller/one year old Saplings raised in appropriate size of bags, preferably eco-friendly bags should be planted as per the advice of local forest authorities/botanist/Horticulturist with regard to site specific choices. The proponent shall earmark the greenbelt area with GPS coordinates all along the boundary of the project site with at least 3 meters wide and in between blocks in an organized manner
37. 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.

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38. 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.
39. 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.
40. 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.
41. 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.
42. Details of litigation pending against the project, if any, with direction /order passed by any Court of Law against the Project should be given.
43. Benefits of the Project if the Project is implemented should be spelt out. The benefits of the Project shall clearly indicate environmental, social, economic, employment potential, etc.
44. 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.
45. 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.
46. Concealing any factual information or submission of false/fabricated data and failure to comply with any of the conditions mentioned above may result in withdrawal of this Terms of Conditions besides attracting penal provisions in the Environment (Protection) Act, 1986.

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Appendix -I
List of Native Trees Suggested for Planting

No	Scientific Name	Tamil Name	Tamil Name
1	*Aegle marmelos*	Vilvam	வில்வம்
2	*Adenanthera pavonina*	Manjadi	மஞ்சாடி, சூலைக்குறிமணி
3	*Albizia lebbeck*	Vaagai	வாகை
4	*Albizia amara*	Usil	உசில்
5	*Bauhinia purpurea*	Mantharai	மந்தாரை
6	*Bauhinia racemosa*	Aathi	ஆத்தி
7	*Bauhinia tomentosa*	Iruvathi	இருவாத்தி
8	*Buchanania axillaris*	Kattuma	காட்டுமா
9	*Borassus flabellifer*	Panai	பனை
10	*Butea monosperma*	Murukkamaram	முருக்கமரம்
11	*Bobax ceiba*	Ilavu, Seyvilavu	இலவு
12	*Calophyllum inophyllum*	Punnai	புன்னை
13	*Cassia fistula*	Sarakondrai	சரக்கொன்றை
14	*Cassia roxburghii*	Sengondrai	செங்கொன்றை
15	*Chloroxylon swietenia*	Purasamaram	புரசமரம்
16	*Cochlospermum religiosum*	Kongu, Manjalllavu	கோங்கு, மஞ்சள் இலவு
17	*Cordia dichotoma*	Naruvili	நருவிலி
18	*Crateva adansoni*	Mavalingam	மாவிலிங்கம்
19	*Dillenia indica*	Uva, Uzha	உசா
20	*Dillenia pentagyna*	SiruUva, Sitruzha	சிறு உசா
21	*Diospyro sebenum*	Karungali	கருங்காலி
22	*Diospyro schlorexylon*	Vaganai	வாகனை
23	*Ficus amplissima*	Kalltchu	கல் இச்சி
24	*Hibiscus tiliaceou*	Aatrupoovarasu	ஆற்றுப்பூவரசு
25	*Hardwickia binata*	Aacha	ஆச்சா
26	*Holoptelia integrifolia*	Aavili	ஆயா மரம், ஆவில்
27	*Lannea coromandelica*	Odhuam	ஓதியம்
28	*Laperstroemia speciosa*	Poo Marudhu	பூ மருது
29	*Lepisanthus tetraphylla*	Neikottaimaram	நெய் கொட்டை மரம்
30	*Limonia acidissima*	Vila maram	விளா மரம்
31	*Litsea glutinos*	Pisinpattai	கருவா, பிசின்பட்டை
32	*Madhuca longifolia*	Illuppai	இலுப்பை
33	*Manilkara hexandra*	UlakkaiPaalai	உலக்கை பாலை
34	*Mimusops elengi*	Magizhamaram	மகிழமரம்
35	*Mitragyna parvifolia*	Kadambu	கடம்பு
36	*Morinda pubescens*	Nuna	நுனா
37	*Morinda citrifolia*	Vellai Nuna	வெள்ளை நுனா
38	*Phoenix sylvestre*	Eachai	ஈச்சம்
39	*Pongamia pinnat*	Pungam	புங்கம்

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40	*Premna wolhiensis*	Munnai	முன்னை
41	*Premna serratifolia*	Narumunnai	நறு முன்னை
42	*Premna tomentosa*	Malaipoovarasu	மலை பூவரசு
43	*Prosopis cineria*	Vanni maram	வன்னி மரம்
44	*Pterocarpus marsupium*	Vengai	வேங்கை
45	*Pterospermum canescens*	Vennangu, Tada	வெண்தேக்கு
46	*Pterospermum xylocarpum*	Polavu	பலவு
47	*Putranjiva roxburghii*	Kanpala	கற்பாலா
48	*Saltadora persica*	Ugaa Maram	உகா மரம்
49	*Sapindus emarginatus*	Manipungan, Soapukai	மணிப்புங்கன் சோப்புக்காய்
50	*Saraca asoca*	Asoca	அசோகா
51	*Streblus asper*	Purai maram	பூரை மரம்
52	*Strychnos nuxvomic*	Yetti	எட்டி
53	*Strychnos potatorum*	Therthang Kottai	தேற்றா கொட்டை
54	*Syzygium cumini*	Naval	நாவல்
55	*Terminalia belleric*	Thandri	தான்றி
56	*Terminalia arjuna*	Ven marudhu	வெண் மருது
57	*Toona ciliate*	Sandhana vembu	சந்தன வேம்பு
58	*Thespesia populnea*	Puvarasu	பூவரசு
59	*Vitex trifolata*	valiura	வாலிபர்
60	*Wrightia tinctoria*	Veppalai	வெப்பாலை
61	*Pithecellobium dulce*	Kodukkapuli	கொடுக்காப்புளி

Discussion by SEIAA and the Remarks:-

The proposal was placed in the 632nd Authority meeting held on 21.06.2023 & 22.06.2023. The authority noted that this proposal was placed for appraisal in 382nd meeting of SEAC held on 09.06.2023, the committee has furnished its recommendations for granting ToR with Public hearing subject to the conditions stated therein. After detailed discussions, the Authority accepts the recommendation of SEAC and decided to grant **Terms of Reference (ToR) along with Public Hearing** under cluster for undertaking the combined Environment Impact Assessment Study and preparation of separate Environment Management Plan subject to the conditions as recommended by SEAC & normal conditions in addition to the conditions in '**Annexure B**' of this minute

Annexure 'B'

Cluster Management Committee

1. Cluster Management Committee shall be framed which must include all the proponents in the cluster as members including the existing as well as proposed quarry.

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2. The members must coordinate among themselves for the effective implementation of EMP as committed including Green Belt Development, Water sprinkling, tree plantation, blasting etc.,
3. The List of members of the committee formed shall be submitted to AD/Mines before the execution of mining lease and the same shall be updated every year to the AD/Mines.
4. Detailed Operational Plan must be submitted which must include the blasting frequency with respect to the nearby quarry situated in the cluster, the usage of haul roads by the individual quarry in the form of route map and network.
5. The committee shall deliberate on risk management plan pertaining to the cluster in a holistic manner especially during natural calamities like intense rain and the mitigation measures considering the inundation of the cluster and evacuation plan.
6. The Cluster Management Committee shall form Environmental Policy to practice sustainable mining in a scientific and systematic manner in accordance with the law. The role played by the committee in implementing the environmental policy devised shall be given in detail.
7. The committee shall furnish action plan regarding the restoration strategy with respect to the individual quarry falling under the cluster in a holistic manner.
8. The committee shall furnish the Emergency Management plan within the cluster.
9. The committee shall deliberate on the health of the workers/staff involved in the mining as well as the health of the public.
10. The committee shall furnish an action plan to achieve sustainable development goals with reference to water, sanitation & safety.
11. The committee shall furnish the fire safety and evacuation plan in the case of fire accidents.

Impact study of mining

12. Detailed study shall be carried out in regard to impact of mining around the proposed mine lease area covering the entire mine lease period as per precise area communication order issued from reputed research institutions on the following
    a) Soil health & soil biological, physical land chemical features .
    b) Climate change leading to Droughts, Floods etc.
    c) Pollution leading to release of Greenhouse gases (GHG), rise in Temperature, & Livelihood of the local people.
    d) Possibilities of water contamination and impact on aquatic ecosystem health.
    e) Agriculture, Forestry & Traditional practices.

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f) Hydrothermal/Geothermal effect due to destruction in the Environment.

g) Bio-geochemical processes and its foot prints including environmental stress.

h) Sediment geochemistry in the surface streams.

Agriculture & Agro-Biodiversity

13. Impact on surrounding agricultural fields around the proposed mining Area.
14. Impact on soil flora & vegetation around the project site.
15. Details of type of vegetations including no. of trees & shrubs within the proposed mining area and. If so, transplantation of such vegetations all along the boundary of the proposed mining area shall committed mentioned in EMP.
16. The Environmental Impact Assessment should study the biodiversity, the natural ecosystem, the soil micro flora, fauna and soil seed banks and suggest measures to maintain the natural Ecosystem.
17. Action should specifically suggest for sustainable management of the area and restoration of ecosystem for flow of goods and services.
18. The project proponent shall study and furnish the impact of project on plantations in adjoining patta lands, Horticulture, Agriculture and livestock.

Forests

19. The project proponent shall detailed study on impact of mining on Reserve forests free ranging wildlife.
20. The Environmental Impact Assessment should study impact on forest, vegetation, endemic, vulnerable and endangered indigenous flora and fauna.
21. The Environmental Impact Assessment should study impact on standing trees and the existing trees should be numbered and action suggested for protection.
22. The Environmental Impact Assessment should study impact on protected areas, Reserve Forests, National Parks, Corridors and Wildlife pathways, near project site.

Water Environment

23. Hydro-geological study considering the contour map of the water table detailing the number of ground water pumping & open wells, and surface water bodies such as rivers, tanks, canals, ponds etc. within 1 km (radius) so as to assess the impacts on the nearby waterbodies due to mining activity. Based on actual monitored data, it may clearly be shown whether working will intersect groundwater. Necessary data and documentation in this regard may be provided, covering the entire mine lease period.

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24. Erosion Control measures.
25. Detailed study shall be carried out in regard to impact of mining around the proposed mine lease area on the nearby Villages, Water-bodies/ Rivers, & any ecological fragile areas.
26. The project proponent shall study impact on fish habitats and the food WEB/ food chain in the water body and Reservoir.
27. The project proponent shall study and furnish the details on potential fragmentation impact on natural environment, by the activities.
28. The project proponent shall study and furnish the impact on aquatic plants and animals in water bodies and possible scars on the landscape, damages to nearby caves, heritage site, and archaeological sites possible land form changes visual and aesthetic impacts.
29. The Terms of Reference should specifically study impact on soil health, soil erosion, the soil physical, chemical components and microbial components.
30. The Environmental Impact Assessment should study on wetlands, water bodies, rivers streams, lakes and farmer sites.

Energy

31. The measures taken to control Noise, Air, Water, Dust Control and steps adopted to efficiently utilise the Energy shall be furnished.

Climate Change

32. The Environmental Impact Assessment shall study in detail the carbon emission and also suggest the measures to mitigate carbon emission including development of carbon sinks and temperature reduction including control of other emission and climate mitigation activities.
33. The Environmental Impact Assessment should study impact on climate change, temperature rise, pollution and above soil & below soil carbon stock.

Mine Closure Plan

34. Detailed Mine Closure Plan covering the entire mine lease period as per precise area communication order issued.

EMP

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

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36. The Environmental Impact Assessment should hold detailed study on EMP with budget for Green belt development and mine closure plan including disaster management plan.

Risk Assessment

37. To furnish risk assessment and management plan including anticipated vulnerabilities during operational and post operational phases of Mining.

Disaster Management Plan

38. To furnish disaster management plan and disaster mitigation measures in regard to all aspects to avoid/reduce vulnerability to hazards & to cope with disaster/untoward accidents in & around the proposed mine lease area due to the proposed method of mining activity & its related activities covering the entire mine lease period as per precise area communication order issued.

Others

39. The project proponent shall furnish VAO certificate with reference to 300m radius regard to approved habitations, schools, Archaeological sites, Structures, railway lines, roads, water bodies such as streams, odai, vaari, canal, channel, river, lake pond, tank etc.
40. As per the MoEF& CC office memorandum F.No.22-65/2017-IA.III dated: 30.09.2020 and 20.10.2020 the proponent shall address the concerns raised during the public consultation and all the activities proposed shall be part of the Environment Management Plan.
41. The project proponent shall study and furnish the possible pollution due to plastic and microplastic on the environment. The ecological risks and impacts of plastic & microplastics on aquatic environment and fresh water systems due to activities, contemplated during mining may be investigated and reported.

A. STANDARD TERMS OF REFERENCE

1) Year-wise production details since 1994 should be given, clearly stating the highest production achieved in any one year prior to 1994. It may also be categorically informed whether there had been any increase in production after the EIA Notification 1994 came into force, w.r.t. the highest production achieved prior to 1994.
2) A copy of the document in support of the fact that the Proponent is the rightful lessee of the mine should be given.

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3) All documents including approved mine plan, EIA and Public Hearing should be compatible with one another in terms of the mine lease area, production levels, waste generation and its management, mining technology etc. and should be in the name of the lessee.

4) All corner coordinates of the mine lease area, superimposed on a High Resolution Imagery/ topo sheet, topographic sheet, geomorphology and geology of the area should be provided. Such an Imagery of the proposed area should clearly show the land use and other ecological features of the study area (core and buffer zone).

5) Information should be provided in Survey of India Topo sheet in 1:50,000 scale indicating geological map of the area, geomorphology of land forms of the area, existing minerals and mining history of the area, important water bodies, streams and rivers and soil characteristics.

6) Details about the land proposed for mining activities should be given with information as to whether mining conforms to the land use policy of the State; land diversion for mining should have approval from State land use board or the concerned authority.

7) It should be clearly stated whether the proponent Company has a well laid down Environment Policy approved by its Board of Directors? If so, it may be spelt out in the EIA Report with description of the prescribed operating process/procedures to bring into focus any infringement/deviation/violation of the environmental or forest norms/ conditions? The hierarchical system or administrative order of the Company to deal with the environmental issues and for ensuring compliance with the EC conditions may also be given. The system of reporting of non-compliances / violations of environmental norms to the Board of Directors of the Company and/or shareholders or stakeholders at large, may also be detailed in the EIA Report.

8) Issues relating to Mine Safety, including subsidence study in case of underground mining and slope study in case of open cast mining, blasting study etc. should be detailed. The proposed safeguard measures in each case should also be provided.

9) The study area will comprise of 10 km zone around the mine lease from lease periphery and the data contained in the EIA such as waste generation etc. should be for the life of the mine / lease period.

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10) Land use of the study area delineating forest area, agricultural land, grazing land, wildlife sanctuary, national park, migratory routes of fauna, water bodies, human settlements and other ecological features should be indicated. Land use plan of the mine lease area should be prepared to encompass preoperational, operational and post operational phases and submitted. Impact, if any, of change of land use should be given.

11) Details of the land for any Over Burden Dumps outside the mine lease, such as extent of land area, distance from mine lease, its land use, R&R issues, if any, should be given.

12) Certificate from the Competent Authority in the State Forest Department should be provided, confirming the involvement of forest land, if any, in the project area. In the event of any contrary claim by the Project Proponent regarding the status of forests, the site may be inspected by the State Forest Department along with the Regional Office of the Ministry to ascertain the status of forests, based on which, the Certificate in this regard as mentioned above be issued. In all such cases, it would be desirable for representative of the State Forest Department to assist the Expert Appraisal Committees.

13) Status of forestry clearance for the broken up area and virgin forestland involved in the Project including deposition of Net Present Value (NPV) and Compensatory Afforestation (CA) should be indicated. A copy of the forestry clearance should also be furnished.

14) Implementation status of recognition of forest rights under the Scheduled Tribes and other Traditional Forest Dwellers (Recognition of Forest Rights) Act, 2006 should be indicated.

15) The vegetation in the RF / PF areas in the study area, with necessary details, should be given.

16) A study shall be got done to ascertain the impact of the Mining Project on wildlife of the study area and details furnished. Impact of the project on the wildlife in the surrounding and any other protected area and accordingly, detailed mitigative measures required, should be worked out with cost implications and submitted.

17) Location of National Parks, Sanctuaries, Biosphere Reserves, Wildlife Corridors, Ramsar site Tiger/ Elephant Reserves/(existing as well as proposed), if any, within 10 km of the mine lease should be clearly indicated, supported by a location map duly authenticated by Chief Wildlife Warden. Necessary clearance, as may be applicable to such projects due to proximity of the ecologically sensitive areas as mentioned above, should be obtained from the Standing Committee of National Board of Wildlife and copy furnished.

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18) A detailed biological study of the study area [core zone and buffer zone (10 km radius of the periphery of the mine lease)] shall be carried out. Details of flora and fauna, endangered, endemic and RET Species duly authenticated, separately for core and buffer zone should be furnished based on such primary field survey, clearly indicating the Schedule of the fauna present. In case of any scheduled-I fauna found in the study area, the necessary plan along with budgetary provisions for their conservation should be prepared in consultation with State Forest and Wildlife Department and details furnished. Necessary allocation of funds for implementing the same should be made as part of the project cost.

19) Proximity to Areas declared as 'Critically Polluted' or the Project areas likely to come under the 'Aravali Range', (attracting court restrictions for mining operations), should also be indicated and where so required, clearance certifications from the prescribed Authorities, such as the SPCB or State Mining Department should be secured and furnished to the effect that the proposed mining activities could be considered.

20) Similarly, for Coastal Projects, a CRZ map duly authenticated by one of the authorized agencies demarcating LTL, HTL, CRZ area, location of the mine lease with respect to CRZ, coastal features such as mangroves, if any, should be furnished. (Note: The Mining Projects falling under CRZ would also need to obtain approval of the concerned Coastal Zone Management Authority).

21) R&R Plan/compensation details for the Project Affected People (PAP) should be furnished. While preparing the R&R Plan, the relevant State/National Rehabilitation & Resettlement Policy should be kept in view. In respect of SCs /STs and other weaker sections of the society in the study area, a need based sample survey, family-wise, should be undertaken to assess their requirements, and action programmes prepared and submitted accordingly, integrating the sectoral programmes of line departments of the State Government. It may be clearly brought out whether the village(s) located in the mine lease area will be shifted or not. The issues relating to shifting of village(s) including their R&R and socio-economic aspects should be discussed in the Report.

22) One season (non-monsoon) [i.e. March-May (Summer Season); October-December (post monsoon season) ; December-February (winter season)]primary baseline data on ambient air quality as per CPCB Notification of 2009, water quality, noise level, soil and flora and fauna shall be collected and the AAQ and other data so compiled presented date-wise in the EIA and

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

23) Air quality modeling should be carried out for prediction of impact of the project on the air quality of the area. It should also take into account the impact of movement of Vehicles for transportation of mineral. The details of the model used and input parameters used for modeling should be provided. The air quality contours may be shown on a location map clearly indicating the location of the site, location of sensitive receptors, if any, and the habitation. The wind roses showing pre-dominant wind direction may also be indicated on the map.

24) The water requirement for the Project, its availability and source should be furnished. A detailed water balance should also be provided. Fresh water requirement for the Project should be indicated.

25) Necessary clearance from the Competent Authority for drawl of requisite quantity of water for the Project should be provided.

26) Description of water conservation measures proposed to be adopted in the Project should be given. Details of rainwater harvesting proposed in the Project, if any, should be provided.

27) Impact of the Project on the water quality, both surface and groundwater, should be assessed and necessary safeguard measures, if any required, should be provided.

28) Based on actual monitored data, it may clearly be shown whether working will intersect groundwater. Necessary data and documentation in this regard may be provided. In case the working will intersect groundwater table, a detailed Hydro Geological Study should be undertaken and Report furnished. The Report inter-alia, shall include details of the aquifers present and impact of mining activities on these aquifers. Necessary permission from Central Ground Water Authority for working below ground water and for pumping of ground water should also be obtained and copy furnished.

29) Details of any stream, seasonal or otherwise, passing through the lease area and modification / diversion proposed, if any, and the impact of the same on the hydrology should be brought out.

30) Information on site elevation, working depth, groundwater table etc. Should be provided both in AMSL and bgl. A schematic diagram may also be provided for the same.

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31) A time bound Progressive Greenbelt Development Plan shall be prepared in a tabular form (indicating the linear and quantitative coverage, plant species and time frame) and submitted, keeping in mind, the same will have to be executed up front on commencement of the Project. Phase-wise plan of plantation and compensatory afforestation should be charted clearly indicating the area to be covered under plantation and the species to be planted. The details of plantation already done should be given. The plant species selected for green belt should have greater ecological value and should be of good utility value to the local population with emphasis on local and native species and the species which are tolerant to pollution.

32) Impact on local transport infrastructure due to the Project should be indicated. Projected increase in truck traffic as a result of the Project in the present road network (including those outside the Project area) should be worked out, indicating whether it is capable of handling the incremental load. Arrangement for improving the infrastructure, if contemplated (including action to be taken by other agencies such as State Government) should be covered. Project Proponent shall conduct Impact of Transportation study as per Indian Road Congress Guidelines.

33) Details of the onsite shelter and facilities to be provided to the mine workers should be included in the EIA Report.

34) Conceptual post mining land use and Reclamation and Restoration of mined out areas (with plans and with adequate number of sections) should be given in the EIA report.

35) Occupational Health impacts of the Project should be anticipated and the proposed preventive measures spelt out in detail. Details of pre-placement medical examination and periodical medical examination schedules should be incorporated in the EMP. The project specific occupational health mitigation measures with required facilities proposed in the mining area may be detailed.

36) Public health implications of the Project and related activities for the population in the impact zone should be systematically evaluated and the proposed remedial measures should be detailed along with budgetary allocations.

37) Measures of socio economic significance and influence to the local community proposed to be provided by the Project Proponent should be indicated. As far as possible, quantitative dimensions may be given with time frames for implementation.

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38) Detailed Environmental Management Plan (EMP) to mitigate the environmental impacts which, should inter-alia include the impacts of change of land use, loss of agricultural and grazing land, if any, occupational health impacts besides other impacts specific to the proposed Project.

39) Public Hearing points raised and commitment of the Project Proponent on the same along with time bound Action Plan with budgetary provisions to implement the same should be provided and also incorporated in the final EIA/EMP Report of the Project.

40) Details of litigation pending against the project, if any, with direction /order passed by any Court of Law against the Project should be given.

41) The cost of the Project (capital cost and recurring cost) as well as the cost towards implementation of EMP should be clearly spelt out.

42) A Disaster management Plan shall be prepared and included in the EIA/EMP Report.

43) Benefits of the Project if the Project is implemented should be spelt out. The benefits of the Project shall clearly indicate environmental, social, economic, employment potential, etc.

44) Besides the above, the below mentioned general points are also to be followed:-

a) Executive Summary of the EIA/EMP Report

b) All documents to be properly referenced with index and continuous page numbering.

c) Where data are presented in the Report especially in Tables, the period in which the data were collected and the sources should be indicated.

d) Project Proponent shall enclose all the analysis/testing reports of water, air, soil, noise etc. using the MoEF&CC/NABL accredited laboratories. All the original analysis/testing reports should be available during appraisal of the Project.

e) Where the documents provided are in a language other than English, an English translation should be provided.

f) The Questionnaire for environmental appraisal of mining projects as devised earlier by the Ministry shall also be filled and submitted.

g) While preparing the EIA report, the instructions for the Proponents and instructions for the Consultants issued by MoEF&CC vide O.M. No. J-11013/41/2006-IA. II(I) dated 4th August, 2009, which are available on the website of this Ministry, should be followed.

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h) Changes, if any made in the basic scope and project parameters (as submitted in Form-I and the PFR for securing the TOR) should be brought to the attention of MoEF&CC with reasons for such changes and permission should be sought, as the ToR may also have to be altered. Post Public Hearing changes in structure and content of the draft EIA/EMP (other than modifications arising out of the P.H. process) will entail conducting the PH again with the revised documentation.

i) As per the circular no. J-11011/618/2010-IA. II(I) dated 30.5.2012, certified report of the status of compliance of the conditions stipulated in the Environment Clearance for the existing operations of the project, should be obtained from the Regional Office of Ministry of Environment, Forest and Climate Change, as may be applicable.

j) The EIA report should also include (i) surface plan of the area indicating contours of main topographic features, drainage and mining area, (ii) geological maps and sections and (iii) sections of the mine pit and external dumps, if any, clearly showing the land features of the adjoining area.

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

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

1. Project name and location (Village, District, State, Industrial Estate (if applicable).
2. Process description in brief, specifically indicating the gaseous emission, liquid effluent and solid and hazardous wastes.
3. Measures for mitigating the impact on the environment and mode of discharge or disposal.
4. Capital cost of the project, estimated time of completion.
5. The proponent shall furnish the contour map of the water table detailing the number of wells located around the site and impacts on the wells due to mining activity.
6. A detailed study of the lithology of the mining lease area shall be furnished.
7. Details of village map, "A" register and FMB sketch shall be furnished.
8. Detailed mining closure plan for the proposed project approved by the Geology of Mining department shall be shall be submitted along with EIA report.
9. Obtain a letter /certificate from the Assistant Director of Geology and Mining standing that there is no other Minerals/resources like sand in the quarrying area within the approved depth of mining and below depth of mining and the same shall be furnished in the EIA report.

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10. EIA report should strictly follow the Environmental Impact Assessment Guidance Manual for Mining of Minerals published February 2010.
11. Detail plan on rehabilitation and reclamation carried out for the stabilization and restoration of the mined areas.
12. The EIA study report shall include the surrounding mining activity, if any.
13. Modeling study for Air, Water and noise shall be carried out in this field and incremental increase in the above study shall be substantiated with mitigation measures.
14. A study on the geological resources available shall be carried out and reported.
15. A specific study on agriculture & livelihood shall be carried out and reported.
16. Impact of soil erosion, soil physical chemical and biological property changes may be assumed.
17. Site selected for the project - Nature of land - Agricultural (single/double crop), barren, Govt./ private land, status of is acquisition, nearby (in 2-3 km.) water body, population, with in 10km other industries, forest , eco-sensitive zones, accessibility, (note - in case of industrial estate this information may not be necessary)
18. Baseline environmental data - air quality, surface and ground water quality, soil characteristic, flora and fauna, socio-economic condition of the nearby population
19. Identification of hazards in handling, processing and storage of hazardous material and safety system provided to mitigate the risk.
20. Likely impact of the project on air, water, land, flora-fauna and nearby population
21. Emergency preparedness plan in case of natural or in plant emergencies
22. Issues raised during public hearing (if applicable) and response given
23. CER plan with proposed expenditure.
24. Occupational Health Measures
25. Post project monitoring plan
26. The project proponent shall carry out detailed hydro geological study through intuitions/NABET Accredited agencies.
27. A detailed report on the green belt development already undertaken is to be furnished and also submit the proposal for green belt activities.
28. The proponent shall propose the suitable control measure to control the fugitive emissions during the operations of the mines.
29. A specific study should include impact on flora & fauna, disturbance to migratory pattern of animals.

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30. Reserve funds should be earmarked for proper closure plan.
31. A detailed plan on plastic waste management shall be furnished. Further, the proponent should strictly comply with, Tamil Nadu Government Order (Ms) No.84 Environment and forests (EC.2) Department dated 25.06.2018 regarding ban on one time use and throw away plastics irrespective of thickness with effect from 01.01.2019 under Environment (Protection) Act, 1986. In this connection, the project proponent has to furnish the action plan.

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

a. A note confirming compliance of the TOR, with cross referencing of the relevant sections / pages of the EIA report should be provided.
b. All documents may be properly referenced with index, page numbers and continuous page numbering.
c. Where data are presented in the report especially in tables, the period in which the data were collected and the sources should be indicated.
d. While preparing the EIA report, the instructions for the proponents and instructions for the consultants issued by MoEF & CC vide O.M. No. J-11013/41/2006-IA.II (I) dated 4th August, 2009, which are available on the website of this Ministry should also be followed.
e. The consultants involved in the preparation of EIA/EMP report after accreditation with Quality Council of India (QCI)/National Accreditation Board of Education and Training (NABET) would need to include a certificate in this regard in the EIA/EMP reports prepared by them and data provided by other organization/Laboratories including their status of approvals etc. In this regard circular no F. No.J -11013/77/2004-IA-II(I) dated 2nd December, 2009, 18th March 2010, 28th May 2010, 28th June 2010, 31st December 2010 & 30th September 2011 posted on the Ministry's website http://www.moef.nic.in/ may be referred.
    - After preparing the EIA (as per the generic structure prescribed in Appendix-III of the EIA Notification, 2006) covering the above mentioned points, the proponent willtake further necessary action for obtaining environmental clearance in accordance with the procedure prescribed under the EIA Notification, 2006.
    - The final EIA report shall be submitted to the SEIAA, Tamil Nadu for obtaining Environmental Clearance.

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- 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.

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Copy to:

1. The Additional Chief Secretary to Government, Environment & Forests Department, Govt. of Tamil Nadu, Fort St. George, Chennai - 9
2. The Chairman, Central Pollution Control Board, Parivesh Bhavan,CBD Cum-Office Complex, East Arjun Nagar, New Delhi 110032.
3. The Member Secretary, Tamil Nadu Pollution Control Board,76, Mount Salai, Guindy, Chennai-600 032.
4. The APCCF (C), Regional Office, MoEF & CC (SZ), 34, HEPC Building, 1st & 2nd Floor, Cathedral Garden Road, Nungambakkam, Chennai -34.
5. Monitoring Cell, IA Division, Ministry of Environment, Forests & CC, Paryavaran Bhavan, CGO Complex, New Delhi 110003
6. The District Collector, Vellore District.
7. Stock File.

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POINT WISE COMPLIANCE OF TOR CONDITIONS

S.No	ToR Points	Reply	Pg. No
1	The proponent is requested to carry out a survey and enumerate on the structures located within 50m, 100m, 150m, 200m, 250m, 300m and 500m from the boundary of the mine lease area.	Enumeration of the structures located within 1 km radius of 50m interval from the proposed quarry site is given in **Figure - 3.2, Chapter – 3**. The PP has obtained a letter from Village Administrative Office (VAO), Karadikudi stating that there are no structures situated within 300m radius and no water bodies and village road within 50m radius (Refer **Annexure - 4**). Refer Annexure – 10.	106
2	The proponent shall discuss the funds for mitigation measures to be included in the EMP.	Complied. Funds allocated for Environmental control measures for 5 years is INR 217.01 lakhs. The breakup of the same is given in **Table 10.2, Chapter - 10**.	204
3	The proponent shall adhere to the bench height-5m as stated in the approved mining plan.	Agreed. Will be complied.	-
4	The PP shall frame Environmental Policy and shall appoint Environmental Manager, etc.,	The proposed quarry is small scale magnitude operation and controlled by lessee individually by engaging optimum statutory personals. Based on magnitude of the operation the PP has framed Environmental Policy and the same is incorporated in **section 10.1.4, Chapter - 10**.	**202**
5	The Project Proponent shall conduct the Hydro-geological study considering the contour map of the water table detailing the number of ground water pumping & open wells, and surface water bodies such as rivers, tanks, canals, ponds etc. within 1 km (radius) along with the collected water level data for both monsoon and non-monsoon seasons from the PWD/TWAD so as to assess the impacts on the wells due to mining activity. Necessary data and documentation in this regard may be provided.	The details of Hydro-geological scenario of the study area is provided under **section 3.3.9, Chapter-3**.	142

6	The PP shall spell out a "Slope Stability Action Plan' for the proposed quarry covering the existing condition of the quarry wall including the overall pit slope angle where the proposed depth exceeds 30m and it shall cover the aspects of stability of quarry walls including the access ramp keeping the benches intact.	Not applicable at this stage and it will be complied later once the quarry ultimate pit reaches 32m (17m Above Ground Level and 15m Below Ground level for the period of five years).	-
7	If the blasting operation is to be carried out, the PP shall present a conceptual design for carrying out the NONEL initiation based controlled blasting operation including the line drilling & muffle blasting techniques and a Simulation Model indicating the anticipated Blast-induced Ground Vibration levels in the proposed quarry as stipulated by the DGMS Circular No.7 of 1997 during the EIA portal.	Agreed. Will be complied.	-
8	The PP shall furnish DFO letter stating that the proximity distance of Reserve Forests, Protected Areas, Sanctuaries. Tiger reserve etc., upto a radius of 25 km from the proposed site.	It will be complied. The DFO letter stating that the proximity distance of RF, PF, etc., will be incorporated at the time of Final EIA submission.	-
9	The PP shall provide individual notice regarding the Public Hearing to the nearby house owners located in the vicinity of the project site.	During public hearing process, the opinions and demands of the people will be noted. The replies and commitment made by the proponent along with time bound action plan wherever applicable will be provided in Final EIA/EMP report.	-
10	In the case of proposed lease in an existing (or old) quarry where the benches are non-existent (or) partially formed critical of the bench geometry approved in the Mining Plan, the Project Proponent (PP) shall prepare and submit an 'Action Plan' for carrying out the realignment of the 'highwall' benches to ensure slope stability in the proposed quarry lease which shall be vetted by the concerned Asst. Director of Geology and Mining, during the time of appraisal for obtaining the EC.	Not applicable. This is new project. Height (max) and Width (max) of the benches will be maintained as 5m each and overall slope angle will be at around 80^0 with the horizontal.	-
11	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	Agreed. It will be complied in Final EIA/EMP submission.	-

	mate, mine foreman, ll/l Class mines manager appointed by the proponent.		
12	Since the quarry lies in a cluster situation, the PP shall furnish a Standard Operating Procedure for carrying out the safe blasting operation while considering the adjacent quarries lies in a radial distance of 500 m from their quarry.	Agreed. It will be complied.	92
13	Details of Green belt & fencing shall be included in the EIA Report.	There is no trees within ML area. Green belt. Greenbelt/Plantation will be carried out in and around the lease area to enhance the vegetative growth and aesthetic in the area. In the post mining stage, an area of 0.20.0 Ha will be developed with green belt inside the lease area.	
14	The EIA Coordinators shall obtain and furnish the details of quarry/quarries operated by the proponent in the past, either in the same location or elsewhere in the State with video and photographic evidences.	The details to be incorporated at the time of Final EIA Submission.	-

15	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. • What was the period of the operation and stoppage of the earlier mines with last work permit issued by the AD/DD mines? • Quantity of minerals mined out. • Highest production achieved in any one year. • Detail of approved depth of mining. • Actual depth of the mining achieved earlier. • Name of the person already mined in that leases area. • If EC and CTO already obtained, the copy of the same shall be submitted. • Whether the mining was carried out as per the approved mine plan (or EC if issued) with stipulated benches	Not Applicable. This is a proposed new project. No mining has been carried out in this lease area so far.	-
16	All comer 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).	Complied. • Project coordinates superimposed in satellite imagery are given as **Figure - 2.2, Chapter - 2**. • The 10km Radius Index plan showing buffer zone is given as **Figure - 3.1, Chapter - 3**. • The geology and geomorphology map are provided in **Figure - 3.34 & 3.25, Chapter - 3**. • The Soil map is provided as **Figure - 3.26, Chapter - 3**.	78 & 103
17	The PP shall carry out Drone video survey covering the cluster, Green belt, fencing etc.,	It will be complied after commencement of the mining operation.	-
18	The proponent shall furnish photographs of adequate fencing, greenbelt along the periphery including replantation of existing trees	Greenbelt will be provided once the project has started. Greenbelt plan of the project is detailed in **section 4.5.3 of Chapter - 4**.	-

	& safety distance between the adjacent quarries & water bodies nearby provided as per the approved mining plan	Conceptual plan showing greenbelt in the safety zone (7.5m left for nearby patta land) is given in **Figure - 2.11** and Land use at mine closure stage is given in **Table – 2.13 of Chapter – 2**.	
19	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.	This project proposed to produce 208760 m^3 of Rough stone & 34184 m^3 of Gravel and the annual peak production of 42600 m^3 of Rough Stone (3rd Year) & 17940 m^3 of Gravel (1st year) for the period of 5 years with ultimate depth upto 32m (17m Above Ground Level and 15m Below Ground level). Yearwise production plan is given in **section 2.7.2** and Technology & process description is given in **section 2.7 of Chapter - 2**. Anticipated impacts and their mitigation measure for the applicable environmental attributes is given in **Chapter - 4**.	94
20	The Project Proponent shall provide the Organization chart indicating the appointment of various statutory officials and other competent persons to be appointed as per the provisions of Mines Act'1952 and the MMR, 1961 for carrying out the quarrying operations scientifically and systematically in order to ensure safety and to protect the environment.	Complied. Please refer **Figure - 10.1**.	203
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 meteorology, ambient air quality, Water quality, noise level, soil and flora & fauna are collected during Post-Monsoon season (Oct 2023 to Dec 2023) and detailed in **Chapter-3**.	107
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.	Detailed cumulative impact study has been carried and the same is incorporated in the **Chapter - 7**. The letter received from Dept. of Geology and Mining, Vellore stating the quarries detail within 500m radius is enclosed in **Annexure – 3**. Accordingly, a detailed Environment Management Plan is prepared considering air, water, noise and soil environment and the details are given in **Chapter - 10.**	185 &199

23	Rain water harvesting management with recharging details along with water balance (both monsoon & non-monsoon) be submitted.	Rain water will be diverted into working area by constructing drains to store and use for dust suppression and greenbelt development. The total water requirement per project will be 2.0 KLD. In initial stage, water will be sourced from outside agencies, later the rainwater collected in the mine pit sump will be used for this purpose. The water balance diagram for the same is shown in **Figure - 4.1**.	157
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 pattern of the study area is detailed in **Section 3.3.7, Chapter - 3**. The anticipated impact on land and its mitigative measure are detailed in **Section 4.2.1, Chapter - 4**.	129 & 152
25	Details of the land for storage of Overburden/Waste Dumps (or) Rejects outside the mine lease, such as extent of land area distance from mine lease, its land use, R&R issues, if any, should be provided.	There is no waste anticipated in this Rough stone and Gravel Quarry. The entire quarried minerals will be utilized. The proposed project area is own patta land and in the name of applicant and there is no any habitation within the M.L area. So, R&R issues will not arise.	-
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.	No proximity to Critically polluted areas.	-
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 impact of the mining operations due to this quarry on water environment is studied and mitigation measures are proposed in **Section 4.4**, **Chapter - 4**.	156

		Rain water will be diverted into bottom of the project area by constructing drains to store and use for dust suppression and greenbelt development.	
28	Impact on local transport infrastructure due to the Project should be indicated	Since the production is very less, only few trucks of 5/10T will be used for transport. The effect of transport on local transport will be negligible.	**-**
29	A tree survey shall be carried out (Nos. name of species, age, diameter, etc.,) both within the mining lease applied area & 300m buffer zone and its management during mining activity.	The details of flora in the core zone and the buffer zone are provided in **section 3.3.6, Chapter - 3**. There are no trees within 300m buffer zone of the project area.	**-**
30	A detailed mine closure plan for the proposed project shall be included in EIA/EMP report which should be site-specific.	Complied. Mine Closure Plan has been incorporated in the approved Mining Plan and the same is incorporated in the Chapter – 7. Land use at mine closure stage are given in **Table – 2.13 and Figure - 2.11 of Chapter – 2**.	95
31	Public Hearing points raised and commitments of the project Proponent on the same along with time bound action Plan with budgetary provisions to implement the same should be provided and also incorporated in the final EIA/EMP Report of the Project and to be submitted to SEIAA/SEAC with regard to the Office Memorandum of MoEF & CC accordingly.	Agreed	-
32	The Public Hearing advertisement shall be published in one major National daily and one most circulated vernacular daily.	Agreed	-
33	The PP shall produce/display the EIA report, Executive Summary and other related information with respect to public hearing in Tamil Language also.	Agreed	-
34	As 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.	Accepted. It will be done.	**-**

35	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.	Greenbelt/Plantation will be carried out in and around the lease area to enhance the vegetative growth and aesthetic in the area. In the post mining stage, an area of 0.20.0 Ha will be developed with green belt inside the lease area. Additionally, it is also proposed to plant outside the lease area such as at project surrounding schools, temples, road sides, etc. Refer **section 4.2.1, Chapter -4**.	152
36	Taller/one year old saplings raised in appropriate size of bags, preferably eco-friendly bags should be planted as per the advice of local forest authorities/botanist/horticulturist with regard to site-specific choices. The proponent shall earmark the green belt area with GPS coordinates all along the boundary of the project site with at least 3 m wide and in between blocks in an organized manner.	Accepted. The photographs showing green belt will be provided once it is completed.	**-**
37	A Disaster management Plan shall be prepared and included in the EIA/EMP Report for the complete life of the proposed quarry (or) till the end of the lease period.	The disaster and its management plan is given in **section 7.6, Chapter-7**.	185
38	A Risk assessment and Management plan shall be prepared and included in the EIA/EMP report for the complete life of the proposed quarry or till the end of the lease period.	Risk assessment and its management is given in **section 7.2, Chapter – 7**.	185
39	Occupational Health impacts of the Project should be anticipated and the proposed preventive measures spelt out in detail. Details of pre-placement medical examination and periodical medical examination schedules should be incorporated in the EMP. The project specific occupational health mitigation measures with required facilities proposed in the mining area may be detailed.	Occupational Health Impacts of the project and preventive measures are detailed under **section 4.10 of Chapter-4**.	176
40	Public health implications of the Project and related activities for the population in the impact zone should be systematically evaluated and the	No major impact on public health will be there since the villages are located more than 1km from the lease area.	-

	proposed remedial measures should be detailed along with budgetary allocations.	Details of CER are discussed under **Chapter – 8**.	
41	The Socio-economic studies should be carried out within a 5km 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 is conducted both by visits and secondary data collection. Details are given in **section 3.3.8, Chapter – 3**.	136
42	Details of litigation pending against the project, if any, with direction /order passed by any Court of law against the Project should be given.	No litigation is pending	-
43	Benefits of the Project if the Project is implemented should be spelt out. The benefits of the Project shall clearly indicate environmental, social, economic, employment potential, etc.	Benefits of the project is given in **Chapter – 8**.	196
44	If any quarrying operations were carried out in the proposed quarrying site for which now 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. This is a fresh quarry project.	-
45	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 is planned for the entire life of the mine. The affidavit is enclosed as **Annexure - 11.**	-
46	Concealing any factual information or submission of false/fabricated data and failure to comply with any of the condition mentioned above may result in withdrawal of this Terms of Conditions besides attracting penal provisions in the Environment (Protection) Act, 1986	Agreed	-

Cluster Management Committee			
1	Cluster management committee shall be framed which must include all the proponents in the cluster as members including the existing as well as proposed quarry	There are eight quarries within a 500-metre radius. The proponent will take the initiative to form a cluster management committee once environmental clearance is obtained for this quarry as well as the other proposed quarry.	-
2	The members must coordinate among themselves for the effective implementation of EMP as committed including Green Belt Development, Water sprinkling, tree plantation, blasting etc.,	Agreed. Will be complied. An undertaking in this regard is enclosed as **Annexure - 11**.	-
3	The List of members of the committee formed shall be submitted to AD/Mines before the execution of mining lease and the same shall be updated every year to the AD/Mines.	Agreed. The list of members of the committee formed will be submitted to AD/mines after obtaining Environmental Clearance.	-
4	Detailed Operational Plan must be submitted which must include the blasting frequency with respect to the nearby quarry situated in the cluster, the usage of haul roads by the individual quarry in the form of route map and network.	Agreed. Details of the Operation plan for cluster mining operations will be submitted once we get environmental clearance for all quarries proposed in the cluster area.	-
5	The committee shall deliberate on risk management plan pertaining to the cluster in a holistic manner especially during natural calamities like intense rain and the mitigation measures considering the inundation of the cluster and evacuation plan.	Risk management plan for the individual quarry is given in this report. As far as cluster working condition is concerned, once the committee is formed, risk management as a cluster including inundation of clusters and the evacuation plan will be elaborated and the same will be submitted to the EIA.	-
6	The Cluster Management Committee shall form Environmental Policy to practice sustainable mining in a scientific and systematic manner in accordance with the law. The role played by the committee in implementing the environmental policy devised shall be given in detail.	Environmental policy for the cluster will be framed by the cluster management committee and the policy will be in accordance with EPA Act, 1986 and its amendments, guidelines by MoEF&CC/SEIAA and other regulatory bodies. This policy will be displayed in the quarry.	-
7	The committee shall furnish action plan regarding the restoration strategy with respect to the individual quarry falling under the cluster in a holistic manner.	Agreed. It will be complied as mentioned in the Point No.4	-
8	The committee shall furnish the Emergency Management plan within the cluster.	Agreed. It will be complied as mentioned in the Point No.4.	-

9	The committee shall deliberate on the health of the workers/staff involved in the mining as well as the health of the public.	Agreed. It will be complied as mentioned in the Point No.4.	-
10	The committee shall furnish an action plan to achieve sustainable development goals with reference to water, sanitation & safety.	Agreed. It will be complied as mentioned in the Point No.4.	-
11	The committee shall furnish the fire safety and evacuation plan in the case of fire accidents.	Agreed. It will be complied as mentioned in the Point No.4.	-
Impact study of mining			
12	Detailed study shall be carried out in regard to impact of mining around the proposed mine lease area covering the entire mine lease period as per precise area communication order issued from reputed research institutions on the following,		-
a	Soil health & soil biological, physical land chemical features	Complied. The details are given in section 3.3.5, Chapter - 3.	125
b	Climate change leading to Droughts, Floods etc.	The proposed quarry is a very small-scale Opencast-Mechanized mining method and the anticipated impacts to the climate change, droughts, floods, etc. will be very marginal.	-
c	Pollution leading to release of Greenhouse gases (GHG), rise in Temperature & Livelihood of the local people.	Considering that the quantum of production is less, only 1 excavator, 3 tippers will be engaged. These equipment's will be properly and regularly maintained. Besides, regular vehicular emission tests will be done for the transport vehicles to ensure minimal impact due to carbon emissions. To further mediate the carbon emissions, a good greenbelt and plantation plan has been planned wherein 1160 number of plants will be planted in and around the lease area.	93
d	Possibilities of water contamination and impact on aquatic ecosystem health.	The total water requirement is 2.0 KLD. It will be outsourced from the nearby villages. So, no impact in the project area due to water usage. The wastewater generation in the form of runoff water during rainy season will be collected in the bottom quarry through proper drainage pattern and the collected water will be used for plantation and dust separation during dry season. However, there is no wastewater discharge from this quarry is being anticipated. So, possibilities of water contamination and impact on aquatic ecosystem health is not envisaged.	-

e	Agriculture, Forestry & Traditional practices.	There are no forest area and traditional practices within the project area. However, there are some agricultural lands around the project site. It may be affected due to the quarry operation as such dust particles sedimentation in the agricultural land. It will be controlled at the source level by proper dust separation as such wet drilling, controlled blasting and water sprinkling on the project roads and project surrounding roads. As per Air Quality Modelling the impact of the air quality limited to 0.5km radius. So, there is no impact for the Agriculture, Forestry & Traditional practices located within 10km radius.	-
f	Hydrothermal/Geothermal effect due to destruction in the Environment.	The proposed quarry operation is Opencast-Mechanized operation with drilling, blasting, excavation, loading and transportation. So, the effect of Hydrothermal/Geothermal is not envisaged.	-
g	Bio-geochemical processes and its foot prints including environmental stress.	This is a simple mining operation, so bio-geochemical processes are not envisaged.	-
h	Sediment geochemistry in the surface streams.	There is Periya Eri which is located at a distance of 2.00 km in Northwest direction, Agaram Aru is located at a distance of 4.30 km in Northwest direction, Palar River is located at a distance of 7.44 km in Northern direction and Bahuda River is located at a distance of 7.50 km in Northern direction from the proposed site. The water is temporarily found only during the rainy season. Due to mining operation, there may be minimum impact to the said water bodies due to dust sedimentation. It will be controlled by wet drilling, water sprinkling and plantation.	-
Agriculture & Agro-Biodiversity			
13	Impact on surrounding agricultural fields around the proposed mining Area.	Agreed. It is described in the point no. 12 (e) of this ToR Compliance Annexure-I	-
14	Impact on soil flora & vegetation around the project site.	Complied. The details are given in **section 3.3.5 & 3.3.6, Chapter - 3**.	125 & 127
15	Details of type of vegetations including no. of trees & shrubs within the proposed mining area and, If so, transplantation of such vegetations all	Complied. The details are given in **section 3.3.6, Chapter - 3**.	127

	along the boundary of the proposed mining area shall committed mentioned in EMP.		
16	The Environmental Impact Assessment should study the biodiversity, the natural ecosystem, the soil micro flora, fauna and soil seed banks and suggest measures to maintain the natural Ecosystem.	Complied. The details are given in **Chapter - 3**.	100
17	Action should specifically suggest for sustainable management of the area and restoration of ecosystem for flow of goods and services.	The detailed action plan has been described in the EMP (Chapter - 10) for the sustainable management for the project area and its surroundings.	199
18	The project proponent shall study and furnish the impact of project on plantations in adjoining patta lands, Horticulture, Agriculture and livestock.	Complied. The details are given in **section 4.5, Chapter - 4**.	-
Forests			
19	The project proponent shall detailed study on impact of mining on Reserve Forests free ranging wildlife.	The fauna commonly found in the core and buffer zone is given in **section 3.3.6, Chapter - 3**.	127
20	The Environmental Impact Assessment should study impact on forest, vegetation, endemic, vulnerable and endangered indigenous flora and fauna.	Complied. The details are given in **section 4.5, Chapter - 4**.	159
21	The Environmental Impact Assessment should study impact on standing trees and the existing trees should be numbered and action suggested for protection.	Not Applicable. This is a dry barren land.	**-**
22	The Environmental Impact Assessment should study impact on protected areas, Reserve Forests, National Parks, Corridors and Wildlife pathways, near project site.	There is no protected areas, National Parks, Corridors and Wildlife pathways located in the buffer zone.	**-**
Water Environment			
23	Hydro-geological study considering the contour map of the water table detailing the number of ground water pumping & open wells, and surface water bodies such as rivers, tanks, canals, ponds etc. within 1 km (radius) so as to assess the impacts on the nearby waterbodies due to mining activity. Based on actual monitored data, it may clearly be shown whether working will intersect groundwater. Necessary data and documentation in	Complied. The details are given in **section 3.3.9 of Chapter – 3** and Chapter – 7.	142

	this regard may be provided, covering the entire mine lease period.		
24	Erosion Control measures.	There is no waste generation (OB) in this quarry has been envisaged. However, there may be erosion due to rainy season and that is limited within quarry area. The control measures are explained in Chapter - 4.	183
25	Detailed study shall be carried out in regard to impact of mining around the proposed mine lease area on the nearby Villages, Water-bodies/ Rivers, & any ecological fragile areas.	Complied. The details are incorporated in Chapter - 4.	150
26	The project proponent shall study impact on fish habitats and the food WEB/ food chain in the water body and Reservoir.	Not applicable.	-
27	The project proponent shall study and furnish the details on potential fragmentation impact on natural environment, by the activities.	Fragmentation impact on environment may be due to drilling and blasting. The anticipated impacts and mitigation measures are discussed in Chapter - 4.	150
28	The project proponent shall study and furnish the impact on aquatic plants and animals in water bodies and possible scars on the landscape, damages to nearby caves, heritage site, and archaeological sites possible land form changes visual and aesthetic impacts.	An ecological and biodiversity study has been conducted and the same is incorporated in the **section 3.3.6, Chapter - 3** of this EIA/EMP report. However, there is no any features mentioned in this condition within the M.L area. However, the impacts anticipated with respect to the environment of the project area is very negligible and it will be minimized within the project area. The details are described in **section 4.5, Chapter - 4**.	127 & 159
29	The Terms of Reference should specifically study impact on soil health, soil erosion, the soil physical, chemical components and microbial components.	Agreed.	-
30	The Environmental Impact Assessment should study on wetlands, water bodies, rivers streams, lakes and farmer sites.	Complied. The details are described in **section 3.3.9, Chapter – 3** & **section 4.4, Chapter - 4**.	156
Energy			
31	The measures taken to control Noise, Air, Water, Dust Control and steps adopted to efficiently utilize the Energy shall be furnished.	Complied. The details are described in Chapter - 4.	150
Climate Change			

32	The Environmental Impact Assessment shall study in detail the carbon emission and also suggest the measures to mitigate carbon emission including development of carbon sinks and temperature reduction including control of other emission and climate mitigation activities.	Considering that the quantum of production is less, only 1 excavator, 3 tippers will be engaged. These equipment's will be properly and regularly maintained. Besides, regular vehicular emission tests will be done for the transport vehicles to ensure minimal impact due to carbon emissions. To further mediate the carbon emissions, a good greenbelt and plantation plan has been planned wherein 1,160 number of plants will be planted in and around the lease area.	93
33	The Environmental Impact Assessment should study impact on climate change, temperature rise, pollution and above soil & below soil carbon stock.		93
Mine Closure Plan			
34	Detailed Mine Closure Plan covering the entire mine lease period as per precise area communication order issued.	Complied. Mine Closure Plan has been incorporated in the approved Mining Plan and the same is incorporated in the Chapter – 7. Entire mine lease area at mine closure stage details are given in **Table – 2.13 and Figure - 2.11 of Chapter – 2**.	95
EMP			
35	Detailed Environment Management Plan along with adaptation, mitigation & remedial strategies covering the entire mine lease period as per precise area communication order issued.	Complied. The details are described in Chapter - 10.	199
36	The Environmental Impact Assessment should hold detailed study on EMP with budget for Green belt development and mine closure plan including disaster management plan.	Green belt is proposed in an area of 0.20.0 Ha. Green belt development plan showing the plant species selected is given in **section 4.5.3 of Chapter 4**. The capital cost of Rs. 3.24 Lakhs and Recurring cost of 0.35 Lakhs has been allocated for green belt development.	159
Risk Assessment			
37	To furnish risk assessment and management plan including anticipated vulnerabilities during operational and post operational phases of Mining.	Complied. The details are described in Chapter 7.	185
Disaster Management Plan			
38	To furnish disaster management plan and disaster mitigation measures in regard to all aspects to avoid/reduce vulnerability to hazards & to cope with disaster/untoward accidents in &	Complied. Risk assessment and its management is given in **section 7.2, Chapter – 7**.	185

	around the proposed mine lease area due to the proposed method of mining activity & its related activities covering the entire mine lease period as per precise area communication order issued.		
Others			
39	The project proponent shall furnish VAO certificate with reference to 300m radius regard to approved habitations, schools, Archaeological sites, Structures, railway lines, roads, water bodies such as streams, odai, vaari, canal, channel, river, lake pond, tank etc.	Complied. Enclosed as **Annexure – 4**.	-
40	As per the MoEF& CC office memorandum F.N0.22-65/2017-1A.11I dated: 30.09.2020 and20.10.2020 the proponent shall address the concerns raised during the public consultation and all the activities proposed shall be part of the Environment Management Plan.	Noted. It will be complied in the Final EIA/EMP report.	**-**
41	The project proponent shall study and furnish the possible pollution due to plastic and microplastic on the environment. The ecological risks and impacts of plastic & microplastics on aquatic environment and fresh water systems due to activities, contemplated during mining may be investigated and reported.	Agreed. The plastic waste generation is very negligible and it will be collected from the source level in specific dustbin and disposed through the municipal bins.	**-**

Standard Terms of Reference for (Mining of minerals)			
1	Year-wise production details since 1994 should be given, clearly stating the highest production achieved in any one year prior to 1994. It may also be categorically informed whether there had been any increase in production after the EIA Notification 1994 came into force, w.r.t. the highest production achieved prior to 1994.	Not applicable This is Not a violation category project. This is a New Proposal for Quarrying Rough Stone and Gravel. This proposal falls under B1 Category (Cluster Situation).	**-**

2	A copy of the document in support of the fact that the Proponent is the rightful lessee of the mine should be given	The applied land for quarrying is patta land registered in the name of applicant vide patta no.757 & 943 (**Annexure – 5**). Also, Precise Area Communication letter received from the District Collector, Vellore (**Annexure - 1**)	**-**
3	All documents including approved mine plan, EIA and Public Hearing should be compatible with one another in terms of the mine lease area, production levels, waste generation and its management, mining technology etc. and should be in the name of the lessee.	Complied. All the documents in the name of the lessee.	**-**
4	All corner coordinates of the mine lease area, superimposed on a High Resolution Imagery/ topo-sheet, topographic sheet, geomorphology and geology of the area should be provided. Such an Imagery of the proposed area should clearly show the land use and other ecological features of the study area (core and buffer zone).	Complied. • Project coordinates superimposed in satellite imagery are given as **Figure - 2.2, Chapter - 2**. • The 10km Radius Index plan showing buffer zone is given as **Figure - 3.1, Chapter - 3**. • The geology and geomorphology map are provided in **Figure - 3.34 & 3.25, Chapter - 3**. • The Soil map is provided as **Figure - 3.26, Chapter - 3**.	**-**
5	Information should be provided in Survey of India Topo sheet in 1:50,000 scale indicating geological map of the area, geomorphology of land forms of the area, existing minerals and mining history of the area, important water bodies, streams and rivers and soil characteristics.	Complied. Replied in Standard ToR point No. 4.	198
6	Details about the land proposed for mining activities should be given with information as to whether mining conforms to the land use policy of the State; land diversion for mining should have approval from State land use board or the concerned authority.	The Precise area Communication has been granted by Assistant Director, Dept. of Geology and Mining, Vellore vide Rc.No.71/2022(Mines) dated 28.12.2022. The mining plan was approved by Assistant Director, Dept. of Geology and Mining, Vellore vide	**-**

		Rc.No.71/2022(Mines) dated 13.01.2023.	
7	It should be clearly stated whether the proponent Company has a well laid down Environment Policy approved by its Board of Directors? If so, it may be spelt out in the EIA Report with description of the prescribed operating process/procedures to bring into focus any infringement/deviation/ violation of the environmental or forest norms/ conditions? The hierarchical system or administrative order of the Company to deal with the environmental issues and for ensuring compliance with the EC conditions may also be given. The system of reporting of non-compliances / violations of environmental norms to the Board of Directors of the Company and/or shareholders or stakeholders at large, may also be detailed in the EIA Report.	The proposed quarry is small scale magnitude operation and controlled by lessee individually by engaging optimum statutory personals. Based on magnitude of the operation the PP has framed Environmental Policy and the same is incorporated in **section 10.1.4, Chapter - 10**.	199
8	Issues relating to Mine Safety, including subsidence study in case of underground mining and slope study in case of open cast mining, blasting study etc. should be detailed. The proposed safeguard measures in each case should also be provided.	Various risks likely to arise due to mining activities are detailed under **section 7.2, Chapter-7**. This being an opencast mine, subsidence is not applicable. The impact due to ground vibrations due to blasting is given in **section 4.8, Chapter - 4**.	185
9	The study area will comprise of 10 km zone around the mine lease from lease periphery and the data contained in the EIA such as waste generation etc. should be for the life of the mine / lease period.	Noted. The study area considered for this study is 10 km radius and all data contained in the EIA report such as waste generation etc., is for the Life of the Mine / lease period.	111
10	Land use of the study area delineating forest area, agricultural land, grazing land, wildlife sanctuary, national park, migratory routes of fauna, water bodies, human settlements and other ecological features should be indicated. Land use plan of the mine lease area should be prepared to encompass preoperational, operational and post operational phases and submitted. Impact, if any, of change of land use should be given.	The land use of the study area was studied to demarcate various LULC categories and its details are provided under **section 3.3.7, Chapter-3**. The land use pattern at present and at the end of the quarrying period has been provided in **section 4.2.1, Chapter-4**. The conceptual plan and section of mine lease area is given in **Figure - 2.11 & 2.12, Chapter-2**.	129

11	Details of the land for any Over Burden Dumps outside the mine lease, such as extent of land area, distance from mine lease, its land use, R&R issues, if any, should be given.	There is no waste anticipated in this Rough stone and Gravel Quarry. The entire quarried minerals will be utilized. The proposed project area is own patta land and in the name of applicant and there is no any habitation within the M.L area. So, R&R issues will not arise.	-
12	Certificate from the Competent Authority in the State Forest Department should be provided, confirming the involvement of forest land, if any, in the project area. In the event of any contrary claim by the Project Proponent regarding the status of forests, the site may be inspected by the State Forest Department along with the Regional Office of the Ministry to ascertain the status of forests, based on which, the Certificate in this regard as mentioned above be issued. In all such cases, it would be desirable for representative of the State Forest Department to assist the Expert Appraisal Committees.	Not Applicable. There is no forest land involved in the proposed project area.	-
13	Status of forestry clearance for the broken-up area and virgin forestland involved in the Project including deposition of Net Present Value (NPV) and Compensatory Afforestation (CA) should be indicated. A copy of the forestry clearance should also be furnished.	Not Applicable. There is no forest land involved in the proposed project area.	-
14	Implementation status of recognition of forest rights under the Scheduled Tribes and other Traditional Forest Dwellers (Recognition of Forest Rights) Act, 2006 should be indicated.	Not Applicable. There is no forest land involved in the proposed project area. The project doesn't attract Recognition of Forest Rights Act, 2006.	-
15	The vegetation in the RF / PF areas in the study area, with necessary details, should be given.	Vegetation in the study area are provided in **section 3.3.6, Chapter – 3**.	127
16	A study shall be got done to ascertain the impact of the Mining Project on wildlife of the study area and details furnished. Impact of the project on the wildlife in the surrounding and any other protected area and accordingly, detailed mitigative measures required,	The mining lease area and the 10 km buffer zone from the periphery of the core zone is devoid of declared ecologically sensitive features like national parks, biospheres, sanctuaries, etc.	-

	should be worked out with cost implications and submitted.		
17	Location of National Parks, Sanctuaries, Biosphere Reserves, Wildlife Corridors, Ramsar site Tiger/ Elephant Reserves/(existing as well as proposed), if any, within 10 km of the mine lease should be clearly indicated, supported by a location map duly authenticated by Chief Wildlife Warden. Necessary clearance, as may be applicable to such projects due to proximity of the ecologically sensitive areas as mentioned above, should be obtained from the Standing Committee of National Board of Wildlife and copy furnished.	Not Applicable. Nil within 10 km radius.	-
18	A detailed biological study of the study area [core zone and buffer zone (10 km radius of the periphery of the mine lease)] shall be carried out. Details of flora and fauna, endangered, endemic and RET Species duly authenticated, separately for core and buffer zone should be furnished based on such primary field survey, clearly indicating the Schedule of the fauna present. In case of any scheduled-I fauna found in the study area, the necessary plan along with budgetary provisions for their conservation should be prepared in consultation with State Forest and Wildlife Department and details furnished. Necessary allocation of funds for implementing the same should be made as part of the project cost.	A detailed study of flora and fauna composition in the core and buffer zone of the project has been made. The details are furnished in **section 3.3.6, Chapter -3**.	127
19	Proximity to Areas declared as 'Critically Polluted' or the Project areas likely to come under the 'Aravali Range', (attracting court restrictions for mining operations), should also be indicated and where so required, clearance certifications from the prescribed Authorities, such as the SPCB or State Mining Department should be secured and furnished to the effect that the proposed mining activities could be considered.	Not Applicable	-

20	Similarly, for coastal Projects, A CRZ map duly authenticated by one of the authorized agencies demarcating LTL. HTL, CRZ area, location of the mine lease w.r.t CRZ, coastal features such as mangroves, if any, should be furnished. (Note: The Mining Projects falling under CRZ would also need to obtain approval of the concerned Coastal Zone Management Authority).	Not Applicable	-
21	R&R Plan/compensation details for the Project Affected People (PAP) should be furnished. While preparing the R&R Plan, the relevant State/National Rehabilitation & Resettlement Policy should be kept in view. In respect of SCs /STs and other weaker sections of the society in the study area, a need based sample survey, family-wise, should he undertaken to assess their requirements, and action programmes prepared and submitted accordingly, integrating the sectoral programme of line departments of the State Government. It may be clearly brought out whether the village(s) located in the mine lease area will be shifted or not. The issues relating to shilling of village(s) including their R&R and socio- economic aspects should be discussed in the Report.	Not applicable. The mining activities will be carried out within the mine lease area only. The entire mine lease area of 2.31.50 Ha is a patta land. There is no habitation within 300m radius from the project site (**Refer Annexure - 4**). Hence, the question of R& R does not arise.	-
22	One season (non-monsoon) (i.e. March-May (Summer Season); October-December (post monsoon season) ; December-February (winter season) primary baseline data on ambient air quality as per CPCB Notification of 2009, water quality,: noise level, soil and flora and fauna shall be collected and the AAQ and other data so compiled presented date-wise in the EIA and EMP Report. Site-specific meteorological data should also be collected. The location of the monitoring stations should be such as to represent whole of the study area and justified keeping in view the pre-dominant downwind direction and location of sensitive receptors. There	Baseline data for meteorology, ambient air quality, Water quality, noise level, soil and flora & fauna are collected during Post Monsoon season (Oct 2023 to Dec 2023) as per CPCB Notification and MoEF&CC Guidelines and are detailed in **Chapter - 3**.	127

	should be at least one monitoring station within 500 m of the mine lease in the pre-dominant downwind direction. The mineralogical composition of PM10, particularly for free silica, should be given.		
23	Air quality modeling should be carried out for prediction of impact of the project on the air quality of the area. It should also take into account the impact of movement of Vehicles for transportation of mineral. The details of the model used and input parameters used for modeling should be provided. The air quality contours may be shown on a location map clearly indicating the location of the site, location of sensitive receptors, if any, and the habitation. The wind roses showing pre- dominant wind direction may also be indicated on the map.	Air Quality Modelling for prediction of incremental GLC's of pollutant was carried out using AERMOD view 6.8.6 Model and detailed in **section 4.6, Chapter - 4**. Air Quality Modelling for Cluster are detailed in **section 7.3, Chapter - 7**. The wind roses showing pre-dominant wind direction also indicated in the map.	185
24	The water requirement for the Project, its availability and source should be furnished. A detailed water balance should also be provided. Fresh water requirement for the Project should be indicated.	The entire water requirement for the project is 2.0KLD which will be sourced from outside agencies. Negligible sewage of 0.8 KLD will be generated, for which a septic tank with soak pit will be set up. The water balance diagram is shown in **Figure – 4.1, Chapter - 4**.	157
25	Necessary clearance from the Competent Authority for drawl of requisite quantity of water for the Project should be provided.	Not Applicable. The required water will be outsourced from the nearby village.	-
26	Description of water conservation measures proposed to be adopted in the Project should be given. Details of rainwater harvesting proposed in the Project, if any, should be provided.	Rain water will be diverted into working area by constructing drains to store and use for dust suppression and greenbelt development. In initial stage water will be sourced from outside agencies, later the rainwater collected in the mine pit sump will be used for this purpose.	-
27	Impact of the Project on the water quality, both surface and groundwater should be assessed and necessary safeguard measures, if any required, should be provided.	Impact Studies and Mitigation Measures of Water Environment including Surface Water and Ground Water are discussed in **section 4.4, Chapter - 4**.	156

28	Based on actual monitored data, it may clearly be shown whether working will intersect groundwater. Necessary data and documentation in this regard may be provided. In case the working will intersect groundwater table, a detailed Hydro Geological Study should be undertaken and Report furnished. The Report inter-alia, shall include details of the aquifers present and impact of mining activities on these aquifers. Necessary permission from Central Ground Water Authority for working below ground water and for pumping of ground water should also be obtained and copy furnished.	It is proposed to quarry upto a depth of 32m (17m Above Ground Level and 15m Below Ground level for the period of five years) and the nearby water table is 50m BGL. So, the proposed mine working will not intersect the ground water table.	-
29	Details of any stream, seasonal or otherwise, passing through the lease area and modification / diversion proposed, if any, and the impact of the same on the hydrology should be brought out.	Not applicable. There is no stream, seasonal or otherwise, passing through the lease area.	-
30	Information on site elevation, working depth, groundwater table etc. Should be provided both in AMSL and bgl. A schematic diagram may also be provided for the same.	• The area applied for mining lease is hilly terrain and the altitude of the area is above 310m from MSL. • The ultimate pit depth of mining is 32m (17m AGL and 15m BGL for the period of five years). • Whereas, water table is found at a depth of 50m in summer and 47m in rainy seasons.	154
31	A time bound Progressive Greenbelt Development Plan shall be prepared in a tabular form (indicating the linear and quantitative coverage, plant species and time frame) and submitted, keeping in mind, the same will have to be executed up front on commencement of the project. Phase - wise plan of plantation and compensatory afforestation should be charted clearly indicating the area to be covered under plantation and the species to be planted. The details of plantation already done should be given. The plant species selected for green belt should have	In the lease area, safety barrier 7.5 m left as safety zone. Greenbelt/Plantation will be carried out in and around the lease area to enhance the vegetative growth and aesthetic in the area. Detailed in **section 4.5.3 of Chapter - 4**.	-

	greater ecological value and should be of good utility value to the local population with emphasis on local and native species and the species which are tolerant to pollution.		
32	Impact on local transport infrastructure due to the Project should be indicated. Projected increase in truck traffic as a result of the Project in the present road network (including those outside the Project area) should be worked out, indicating whether it is capable of handling the incremental load. Arrangement for improving the infrastructure, if contemplated (including action to be taken by other agencies such as State Government) should be covered. Project Proponent shall conduct Impact of Transportation study as per Indian Road Congress (IRC) Guidelines.	This is a small quarry and the production is very less. 3 Nos. of 5T/10T tippers will be used for transport. The trips will be minimum. Hence no major impact on transport is expected.	-
33	Details of the onsite shelter and facilities to be provided to the mine workers should be included in the EIA Report.	Infrastructure & other facilities will be provided to the Mine Workers after the grant of quarry lease and the same has been discussed in **Chapter - 2**.	-
34	Conceptual post mining land use and Reclamation and Restoration of mined out areas (with plans and with adequate number of sections) should be given in the EIA report.	The post mining land use/conceptual land use of the study area is given in **section 2.7.3 of Chapter - 2**.	94
35	Occupational Health impacts of the Project should be anticipated and the proposed preventive measures spelt out in detail. Details of pre-placement medical examination and periodical medical examination schedules should be incorporated in the EMP. The project specific occupational health mitigation measures with required facilities proposed in the mining area may be detailed	Occupational health and safety study is given in **section 4.10 of Chapter-4**.	176
36	Public health implications of the Project and related activities for the population in the impact zone should be systematically evaluated and the proposed remedial measures should be detailed along with budgetary allocations	No major impact on public health will be there since the villages are located more than 1km from the lease area.	-

37	Measures of socio economic significance and influence to the local community proposed to be provided by the Project Proponent should be indicated. As far as possible, quantitative dimensions may be given with time frames for implementation.	This project provides employment to 24 people directly & indirectly. Local people will be hired for unskilled labour. Through CER, nearby schools, villages will be benefitted. For CER, INR 5,00,000/- is allocated. Based on the demand of the people during public hearing, further funds will be allocated, if necessary.	-
38	Detailed environmental management plan (EMP) to mitigate the environmental impacts which, should inter-alia include the impacts of change of land use, loss of agricultural and grazing land, if any, occupational health impacts besides other impacts specific to the proposed Project.	Environmental Management plan details are given in **Chapter - 10**.	199
39	Public Hearing points raised and commitment of the Project Proponent on the same along with time bound Action Plan with budgetary provisions to implement the same should be provided and also incorporated in the final EIA/EMP Report of the Project.	During public hearing process, the opinions and demands of the people will be noted. The replies and commitment made by the proponent along with time bound action plan wherever applicable will be provided in Final EIA/EMP report.	-
40	Details of litigation pending against the project, if any, with direction /order paced by any Court of Law against the Project should be given.	There is no litigation pending against the project.	-
41	The cost of the Project (capital cost and recurring cost) as well as the cost towards implementation of EMP should be clearly spelt out.	• Project Cost is **290.4 Lakhs** • CER Cost is **5.00 Lakhs** • Revised total EMP Cost for 5 years is **217.01 lakhs** i.e. Capital Cost of Rs. 60.25 Lakhs + Recurring Cost of Rs. 156.76 Lakhs (for five years). • The breakup of the same is given in **Table 10.2, Chapter - 10**.	176
42	A Disaster management Plan shall be prepared and included in the EIA/EMP Report.	The disaster and its management plan is given in **section 7.6, Chapter-7**.	194
43	Benefits of the Project if the Project is implemented should be spelt out. The benefits of the Project shall clearly indicate environmental, social, economic, employment potential, etc.	• This project will contribute financially through payment of taxes like royalty, GST, etc. The project will also contribute via CSR. The demands of people during public hearing will also be considered by the project proponent.	-

		• This project provides employment to 24 people. Local people will be hired for unskilled labour. Through CER, nearby schools, hospitals will be benefitted. • For CER, INR 5,00,000/- has been allocated.	
44	Besides the above, the below mentioned general points are also to be followed.		-
	a) Executive Summary of the EIA/EMP Report	Yes, Complied.	-
	b) All documents to be properly referenced with index and continuous page numbering.	Yes, Complied.	-
	c) Where data are presented in the Report especially in Tables, the period in which the data were collected and the sources should be indicated.	Yes, Complied.	-
	d) Project Proponent shall enclose all the analysis/testing reports of water, air, soil, noise, etc. using the MoEF&CC/NABL accredited laboratories. All the original analysis/testing reports should be available during appraisal of the Project.	Yes, Complied.	-
	e) Where the documents provided are in a language other than English, an English translation should be provided.	Yes, Complied.	-
	f) The Questionnaire for environmental appraisal of mining projects as devised earlier by the Ministry shall also be filled and submitted.	Yes, Complied.	-
	g) While preparing the EIA report, the instructions for the Proponents and instructions for the Consultants issued by MoEF&CC vide O.M.No.J-11013/41/2006-IA.II(I) dated 4th August 2009 which are available on the website of this Ministry, should be followed.	Yes, Complied.	-

	h) Changes, if any made in the basic scope and project parameters (as submitted in Form-I and the PFR for securing the ToR) should be brought to the attention of MoEF&CC with reasons for such changes and permission should be sought, as the ToR may also have to be altered. Post Public Hearing changes in structure and content of the draft EIA/EMP (other than modifications arising out of the P.H. process) will entail conducting the PH again with the revised documentation.	Yes, Complied.	-
	i) As per the circular no.J-11011/618/2010-IA.II (I) dated 30.5.2012, certified report of the status of compliance of the conditions stipulated in the Environmental Clearance for the existing operations of the project, should be obtained from the Regional Office of Ministry of Environment, Forest and Climate Change, as may be applicable.	Yes, Complied.	-
	j) The EIA report should also include (i) surface plan of the area indicating contours of main topographic features, drainage and mining area, (ii) geological maps and sections and (iii) sections of the mine pit and external dumps, if any, clearly showing the land features of the adjoining area.	Yes, Complied.	-

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CHAPTER - 1

INTRODUCTION

1.1 PURPOSE OF THE REPORT

Environmental Impact Assessment (EIA) as a tool used to identify the environmental, social and economic impacts of a project prior to decision-making. It aims to predict environmental impacts at an early stage in project planning and design, find ways and means to reduce adverse impacts, shape projects to suit the local environment and present the predictions and options to decision-makers.

Thiru.R.Natarajan S/o. Rangasamy, Lessee, has obtained Precise Area communication letter from the Assistant Director, Department of Geology and Mining, Vellore to quarry out 2,08,760 m^3 of Rough Stone and 34,184 m^3 of Gravel. Over an extent of 2.31.50 Ha., located at the Survey No. 253/7, 259/5, 259/2 & 259/4 of Karadikudi Village, Anaicut Taluk, Vellore District, Tamil Nadu State. Hence, this proposed quarry falls under the cluster situation due to the following proposed, existing and abandoned quarries located within 500m radius. The details are given below.

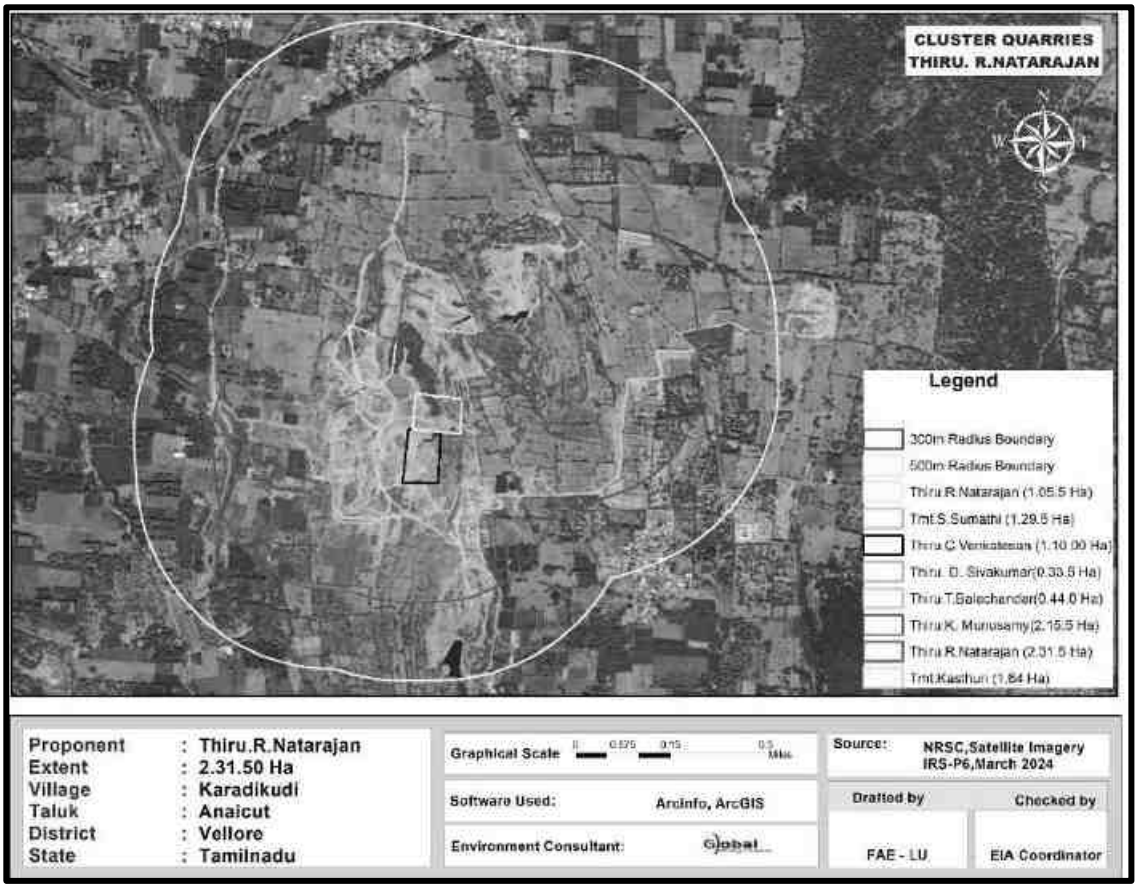
Table - 1.1 Cluster Mines Details

Sl. No	Name and address	Village and Taluk	S.F.Nos.	Extent (in Ha)	Period of lease
Existing Quarries					
1	S.Sumathi	Karadikudi Anaicut	252/5	1.29.5	15.03.2018 to 14.03.2023
2	C.Venkatesan	Karadikudi Anaicut	147/11	1.10.0	18.04.2018 to 17.04.2023
3	D.Sivakumar	Karadikudi Anaicut	258/8	0.33.5	11.02.2019 to 10.02.2024
4	T.Balachandar	Karadikudi Anaicut	253/6	0.44.0	05.07.2021 to 04.07.2026
Expired Quarries					
1	D.Sivakumar	Karadikudi Anaicut	425/11	1.24.5	20.10.2014 to 19.10.2019
2	R.Natarajan	Karadikudi Anaicut	254/4	0.34.0	10.05.2017 to 09.05.2022
Abandoned Quarries					
1	K.Giridharan	Karadikudi Anaicut	242/2,4,8 & 6A	1.36.0	07.06.2010 to 06.05.2015
2	R.Natarajan	Karadikudi Anaicut	246/1,251/3A, 253/4	2.69.0	18.07.2011 to 17.07.2016
Present Proposed Quarries:					

1	K.Munisamy	Karadikudi Anaicut	255/2,7 & 358/2	2.15.5	
2	R.Natarajan	Karadikudi Anaicut	251/3A	1.05.5	
3	R.Natarajan	Karadikudi Anaicut	253/7,259/2,4 &5	2.31.5	
4	Tmt.Kasthuri	Karadikudi Anaicut	253/4	1.64.0	

As per EIA notification, 2006 and its subsequent amendments the proposed Thiru.R.Natarajan S/o. Rangasamy Rough Stone & Gravel Quarry, cluster is falls under Schedule 1(a) Mining of Minerals. It is further classified under Category B1 due to the overall extent of cluster area is 10.33.5 Ha which is >5 Ha. Satellite image of Quarries in Cluster is shown in Fig 1.1.

FIGURE - 1.1 SATELLITE IMAGE SHOWING CLUSTER QUARRIES



The ToR for preparation of EIA/EMP was approved vide ToR Lr.No.SEIAA-TN/F.No.9971/SEAC/ToR-1495/2023, Dated 22.06.2023. This report has been prepared in line with the approved TOR for production of maximum excavation of 2,08,760 m^3 of Rough Stone and 34,184 m^3 of Gravel for a period of five years.

1.2 IDENTIFICATION OF PROJECT & PROJECT PROPONENT

The proposed project is for mining of Rough Stone and gravel (under cluster) from the S.F.No. 253/7, 259/5, 259/2 & 259/4 over an extent of 2.31.50 Ha in Karadikudi Village, Anaicut Taluk, Vellore District, Tamil Nadu State. As per EIA notification, 2006 and its subsequent amendments the project comes under Schedule 1(a) under Category B1 (Lease area >5 to 250 Ha). The proposed project details are given below.

(a) Proposed project details

Sl. No.	Description	Status/Remarks
1.	Sector	Non-coal mining
2.	Category of the project	B1
3.	Proposed mineral	Rough Stone & Gravel quarry
4.	Type of Lease	New Project
5.	Extent of the lease	2.31.50 Ha
6.	Proposed depth of mining	32m BGL (17m AGL + 15m BGL)
7.	Method of mining	Opencast Mechanized
8.	Proposed lease period	5 Years
9.	Proposed Environmental Clearance	5 Years
10.	Proposed production quantity for five years	Rough Stone: 2,08,760 m^3 Gravel: 34,184 m^3

(b) Profile of the project proponent

The proposed lessee Thiru.R.Natarajan S/o. Rangasamy is an individual with sound experience in the identification of quarry, operation and marketing in the field of Rough Stone and gravel quarry. The proposed land is patta land registered in the name of applicant vide patta no.757 & 943, please refer **Annexure - 5**.

(c) Project proponent details

Name of the proponent : Thiru.R.Natarajan

Status of the Proponent : Individual

Address Thiru.R.Natarajan
S/o. Rangasamy
No.147, Kollamangalam Village
Gudiyatham Taluk, Vellore-District

1.3 BRIEF DESCRIPTION OF NATURE, SIZE, LOCATION OF THE PROJECT AND ITS IMPORTANCE TO THE COUNTRY, REGION:

The proposed quarrying operation Opencast Mechanized method with 5m bench height, 5m bench width and overall bench slope is less than 80°. The quarry operation involves shallow jackhammer drilling, slurry blasting, excavation, loading and transportation.

1.3.1 SIZE AND LOCATION OF THE PROJECT

(a) Size of the project

Table - 1.2 Proposed project details

Sl. No.	Feature	Description
1	Type of land	Patta land
2	Extent of lease area	2.31.50 Ha
3	Type of lease	New Project
4	Geological Resource	Rough Stone – 5,35,500 m^3 Gravel - 50,134 m^3
5	Mineable Resource	Rough Stone – 2,08,760 m^3 Gravel – 34,184 m^3
6	Proposed production quantity for five years	Rough Stone – 2,08,760 m^3 Gravel – 34,184 m^3
6	Proposed depth of mining	32m (17m AGL + 15m BGL)

(b) Location of the project

The proposed project site is located in Karadikudi Village, Anaicut Taluk, Vellore District, Tamil Nadu and its Latitude 12°50’40.55" N to 12°50’49.50" N and Longitude: 78°56’07.22" E to 78°56’14.85" E with Survey of India Topo Sheet No. 57- L/13.

1.3.2 IMPORTANCE OF THE PROJECT TO THE COUNTRY AND REGION

There is an increasing demand for rough stone in India and other countries. Since the construction industry is rapidly growing now, there is an increasing demand for rough stone. Thus, this project will contribute not only to the demand of Rough Stone, but also provide employment opportunities to the nearby villages.

1.4 SCOPE OF THE STUDY -DETAILS OF REGULATORY SCOPING CARRIED OUT (AS PER TERMS OF REFERENCE):

Any mining project may cause environmental impacts near the project site during its operation. The type and intensity of impacts on various components of the environment may vary depending on the nature of the project, as well as its geographical location. The net impacts of the project can be quantified through Environment Impact Assessment (EIA) studies on Physical, Biological and Socio-economic environment. The EIA studies give a basis for preparing an Environmental Management Plan (EMP) to conserve the environment of the area.

For the purpose of preparing EIA/EMP the SEIAA, Tamil Nadu has issued a Terms of Reference ToR Lr.No.SEIAA-TN/F.No.9971/SEAC/ToR-1495/2023, Dated 22.06.2023 in accordance with the provisions of EIA Notification 2006 and its subsequent amendments. This EIA study includes both Core and Buffer zone i.e., the lease area and 10km radius of the project area respectively. This EIA report prepared based on the data generated from the Post Monsoon Season (October 2023 to December 2023) and all individual components of environment are described in detail. An in-depth analysis of available information has been made for working out an effective Environmental Management Plan.

1.4.1 PRESENT STUDY

The Project Proponent has assigned M/s. Global Mining Solutions, Salem for conducting Environment Impact Assessment / Environmental Management Plan (EIA/EMP) for this project. The Environmental Impact Assessment and Environmental Management Plan of this cluster quarry addressing all the environmental related impacts and mitigation measures. The EMP report is based on the data generated from October 2023 to December 2023 by M/s. Shrient Analytical & Research Labs Private Limited, Chennai and the data generated by the FAE of the M/s. Global Mining Solutions, Salem. The study evaluates the prevailing baseline environmental conditions. The objectives of the present study are given below.

- To prepare the present baseline scenario through primary field monitoring and secondary data for different environmental descriptors such as air, water, noise, traffic, biodiversity, socio-economic etc.
- To identify the activities of mining that have bearing on the environment
- To Assess the impact of proposed project activity
- To suggest preventive mitigation measures
- To prepare an Environmental Management Plan (EMP) including environmental monitoring.
- To Prepare Disaster Management Plan.

1.4.2 STATUS OF LITIGATIONS

This is a Rough Stone and Gravel Quarry project. There is no litigation/court case pending against this project.

a. Precise Area Communication:

The Project Proponent has obtained Precise Area Communication from the Assistant Director, Dept. of Geology & Mining, Vellore vide Rc.No.71/2022(Mines) dated 28.12.2022. The letter copy enclosed as **Annexure – 1.**

b. Mining Plan Approval Letter:

The project proponent has prepared mining plan under rule 19(1) 41 & 42 of Tamil Nadu Minor Mineral Concession Rules, 1959 and the same has been approved by the The Assistant Director, Dept. of Geology & Mining, Vellore vide Rc.No.71/2022(Mines) dated 13.01.2023. The approval letter along with approved plan is enclosed as **Annexure – 2.**

c. 500m radius quarry features:

The project proponent has obtained an official letter from the The Assistant Director, Dept. of Geology & Mining, Vellore vide Rc.No.72/2022(Mines) dated 13.01.2023. The letter copy enclosed as **Annexure – 3.**

d. Project Proponent undertaking affidavit:

The project proponent has issued an affidavit under in matter of Common Cause vs Union of India & Ors. The Affidavit copy is enclosed as **Annexure – 11.**

e. Land document of the proposed lease area:

It is patta land registered in the name of applicant vide patta no.757 & 943, the applicant has obtained consent from the pattadar are enclosed as **Annexure - 5.**

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CHAPTER - 2

PROJECT DESCRIPTION

2.1 TYPE OF PROJECT

The type of the project is Rough Stone and Gravel Quarry with Opencast-Mechanized mining method to excavate Rough Stone and Gravel within the proposed Mine Lease area with drilling, blasting, loading and transportation. This project is located at S.F. Nos. 253/7, 259/5, 259/2 & 259/4 over an extent of 2.31.50 Ha in Karadikudi Village, Anaicut Taluk, Vellore District, Tamil Nadu State.

As per EIA notification, 2006 and its subsequent amendments the project comes under Schedule 1(a) under Category B1 (Lease area >5 to 250 Ha), considering cluster situation and the total cluster area is 10.33.5 Ha. The details of mines located in the cluster area is certified by Assistant Director, Dept. of Geology & Mining, Vellore vide Rc.No.71/2022 (Mines) dated 13.01.2023.

Table - 2.1 500m Radius Cluster Mines Details

Sl. No	Name and address	Village and Taluk	S.F.Nos.	Extent (in Ha)	Period of lease
Existing Quarries					
1	S.Sumathi	Karadikudi Anaicut	252/5	1.29.5	15.03.2018 to 14.03.2023
2	C.Venkatesan	Karadikudi Anaicut	147/11	1.10.0	18.04.2018 to 17.04.2023
3	D.Sivakumar	Karadikudi Anaicut	258/8	0.33.5	11.02.2019 to 10.02.2024
4	T.Balachandar	Karadikudi Anaicut	253/6	0.44.0	05.07.2021 to 04.07.2026
Expired Quarries					
1	D.Sivakumar	Karadikudi Anaicut	425/11	1.24.5	20.10.2014 to 19.10.2019
2	R.Natarajan	Karadikudi Anaicut	254/4	0.34.0	10.05.2017 to 09.05.2022
Abandoned Quarries					
1	K.Giridharan	Karadikudi Anaicut	242/2,4,8 &6A	1.36.0	07.06.2010 to 06.05.2015
2	R.Natarajan	Karadikudi Anaicut	246/1,251/3A, 253/4	2.69.0	18.07.2011 to 17.07.2016
Present Proposed Quarries:					
1	K.Munisamy	Karadikudi Anaicut	255/2,7 & 358/2	2.15.5	

2	R.Natarajan	Karadikudi Anaicut	251/3A	1.05.5	
3	R.Natarajan	Karadikudi Anaicut	253/7,259/2,4 &5	2.31.5	
4	Tmt.Kasthuri	Karadikudi Anaicut	253/4	1.64.0	

The proposed production is 2,08,760 m^3 of Rough Stone and 34,184 m^3 of Gravel by opencast mechanized mining method.

2.2 NEED FOR THE PROJECT

The salient features of the proposed Rough Stone and Gravel quarry of Thiru.R.Natarajan.

Table - 2.2 The Salient features of the project

S.No.	Type of Detail	Description
1	Sector	1(a) Non coal mining
2	Fresh/Existing project	New Project
3	Category	B1
4	Nature of mineral	Minor Mineral
5	Life of the mine	5 years
6	Production Quantity for five years	Rough Stone - 2,08,760 m^3 Gravel - 34,184 m^3
7	Waste generation and management	Nil
8	Bench height and width	Proposed bench height & width is 5.0m respectively and number of proposed benches is 6 Nos (1+5).
9	Ultimate pit depth	32m (17m AGL + 15m BGL)
10	End use	The excavated Rough Stone and Gravel is used for construction industries for Government & Public sector projects besides catering domestic housing and infrastructure projects in and around the district.

2.3 LOCATION (MAPS SHOWING GENERAL LOCATION, SPECIFIC LOCATION, PROJECT BOUNDARY & PROJECT SITE LAYOUT):

This project site is located in Karadikudi Village, Anaicut Taluk, Vellore District, Tamil Nadu State. The Nearest Railway station Gudiyattam which is about 10.22 km on Northern side of the area. The National Highway (NH-4) Bengaluru – Chennai

Highway is about 5.8 Km on Northwestern side of the area. The State Highway (SH-122) Vellore -Odugathur about 0.34 Km on Northwestern side of the area. The general location is given in **Figure - 2.1**. The specific location is given in **Figure-2.2**.

FIGURE - 2.1 LOCATION MAP

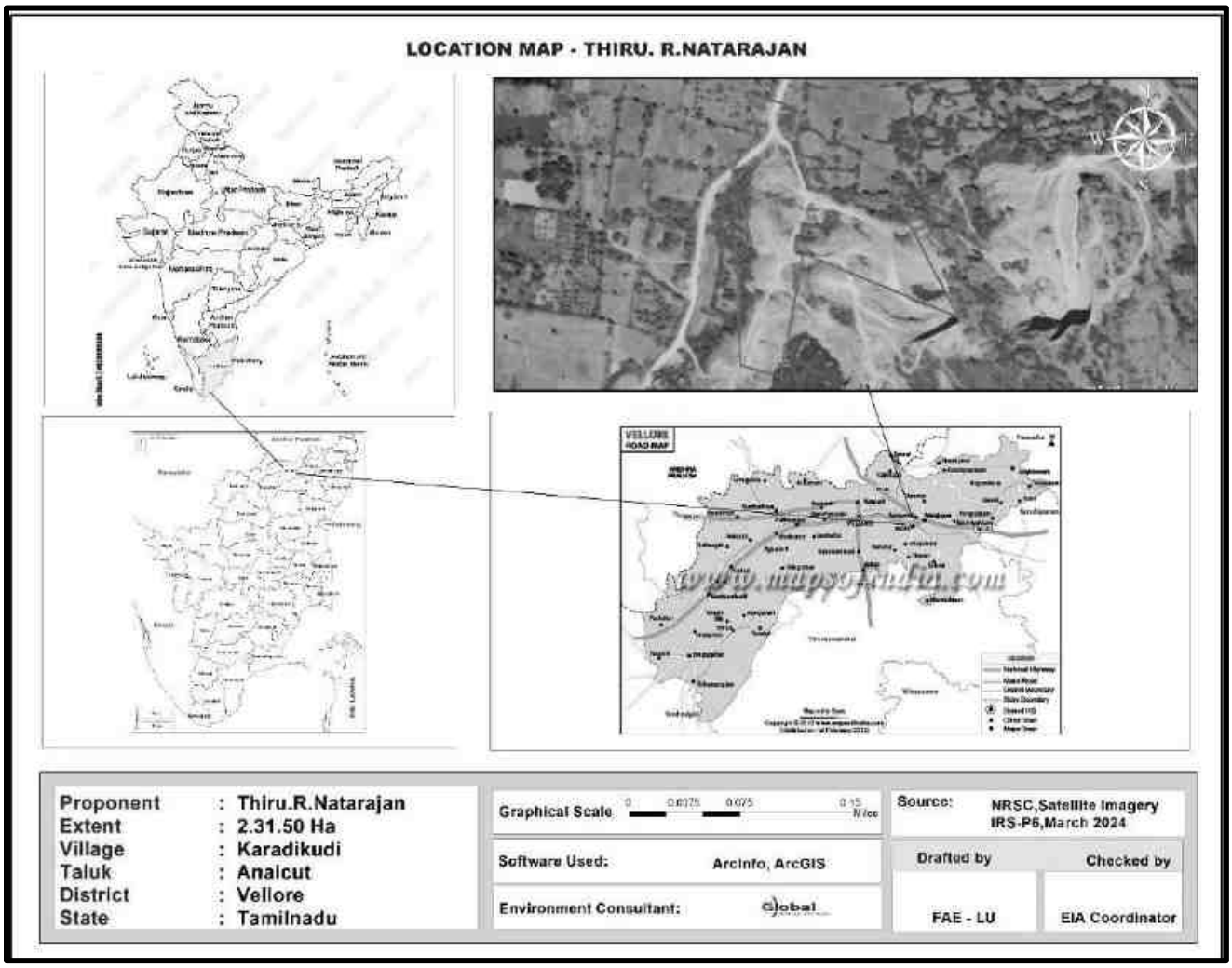


Table - 2.3 Co-ordinates of the Project Site			
Corners	Co- ordinates		Distance between the corners
	Latitude	Longitude	
1	12°50'40.73"N	78°56'07.82"E	1-2=116.0 m
2	12°50'44.47"N	78°56'07.29"E	2-3=13.2 m
3	12°50'44.36"N	78°56'07.72"E	3-4=83.6 m
4	12°50'47.04"N	78°56'07.22"E	4-5=45.0 m
5	12°50'48.14"N	78°56'08.20"E	5-6=42.2 m
6	12°50'49.50"N	78°56'08.01"E	6-7=34.0 m
7	12°50'49.12"N	78°56'09.07"E	7-8=100.2 m
8	12°50'45.87"N	78°56'09.32"E	8-9=117.4 m
9	12°50'45.64"N	78°56'13.19"E	9-10=108.6 m
10	12°50'42.50"N	78°56'14.85"E	10-11=173.6 m
11	12°50'43.98"N	78°56'09.31"E	11-12=105.6 m
12	12°50'40.55"N	78°56'09.12"E	12-1=39.8 m

FIGURE - 2.2 GOOGLE IMAGE SHOWING PROJECT SITE

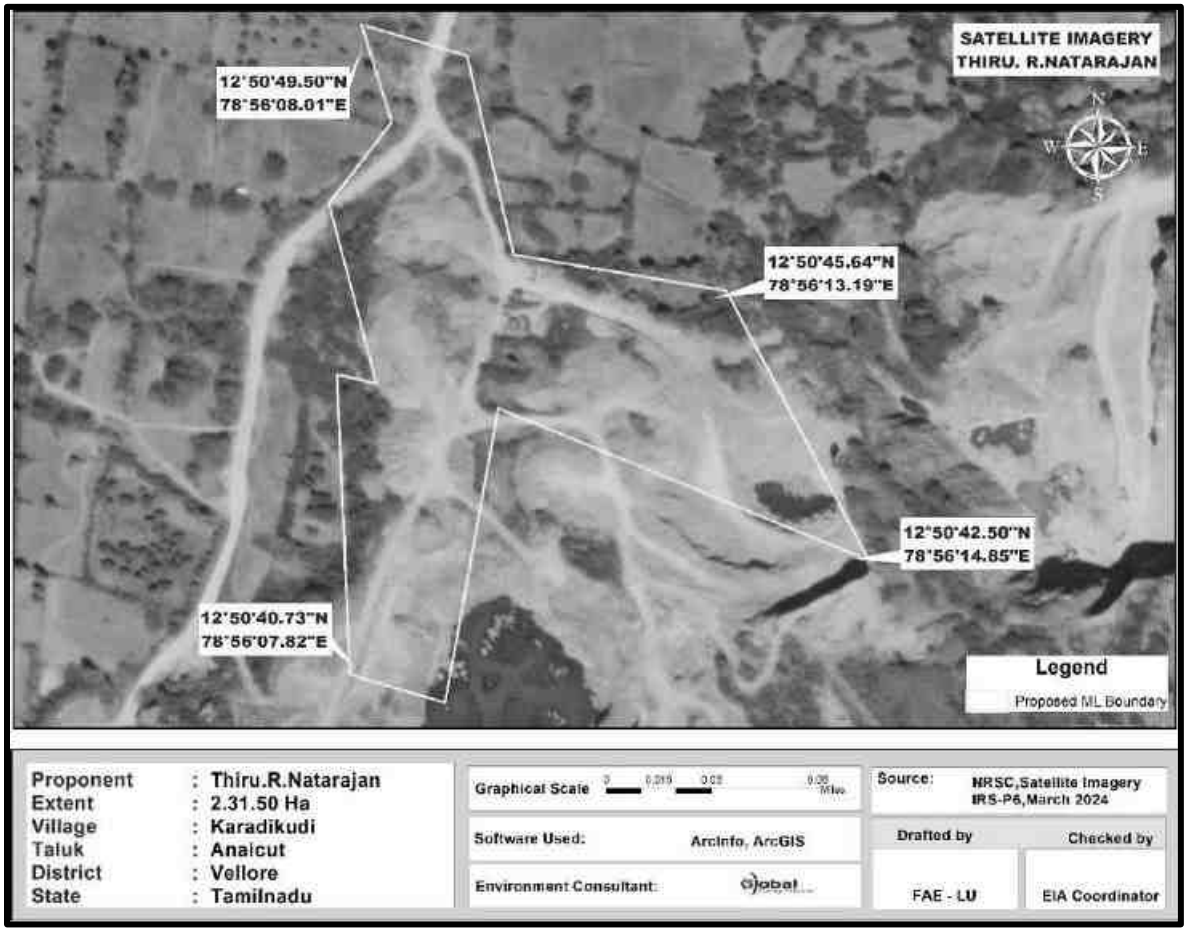


FIGURE - 2.3 SURFACE PLAN PROJECT SITE

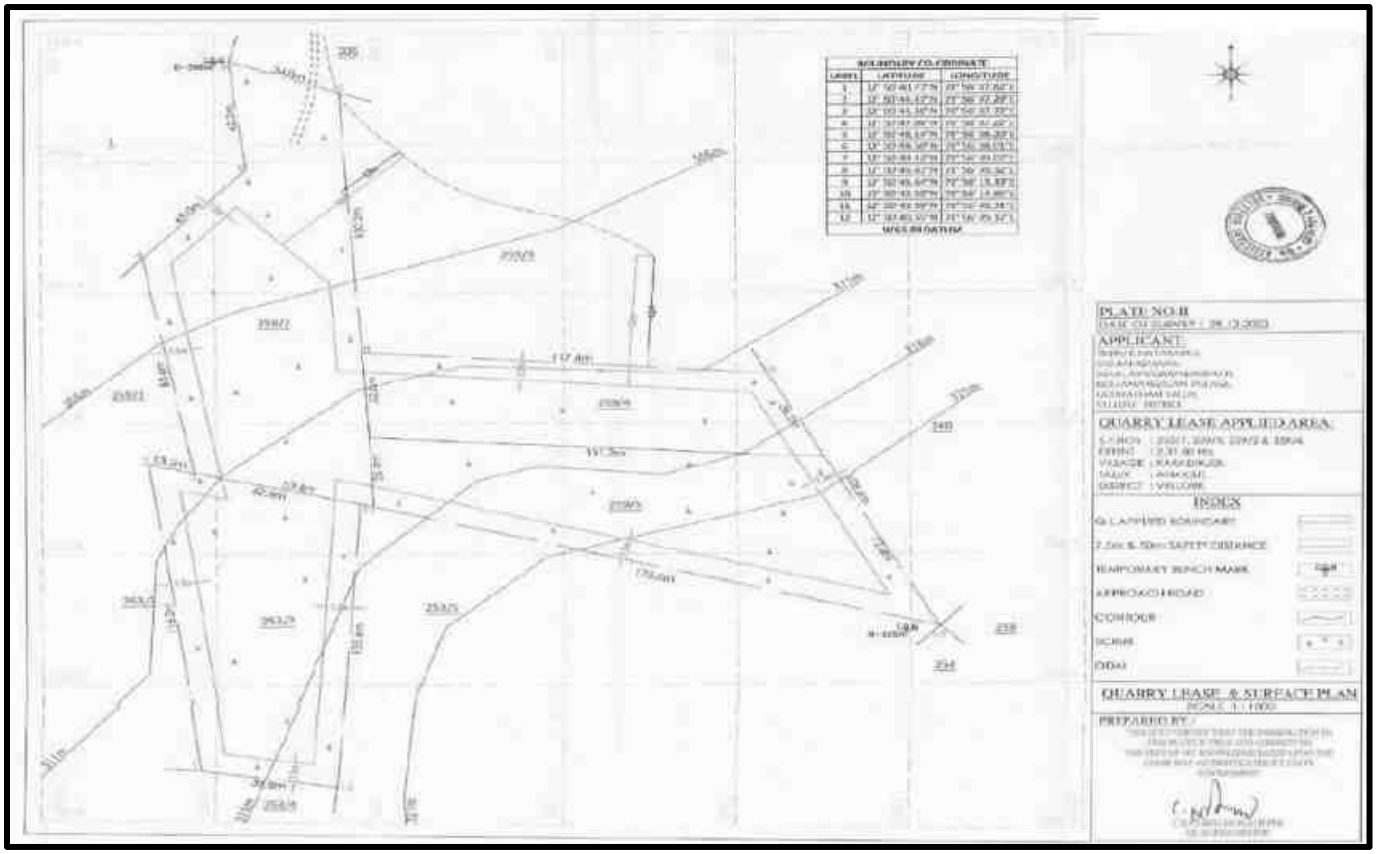
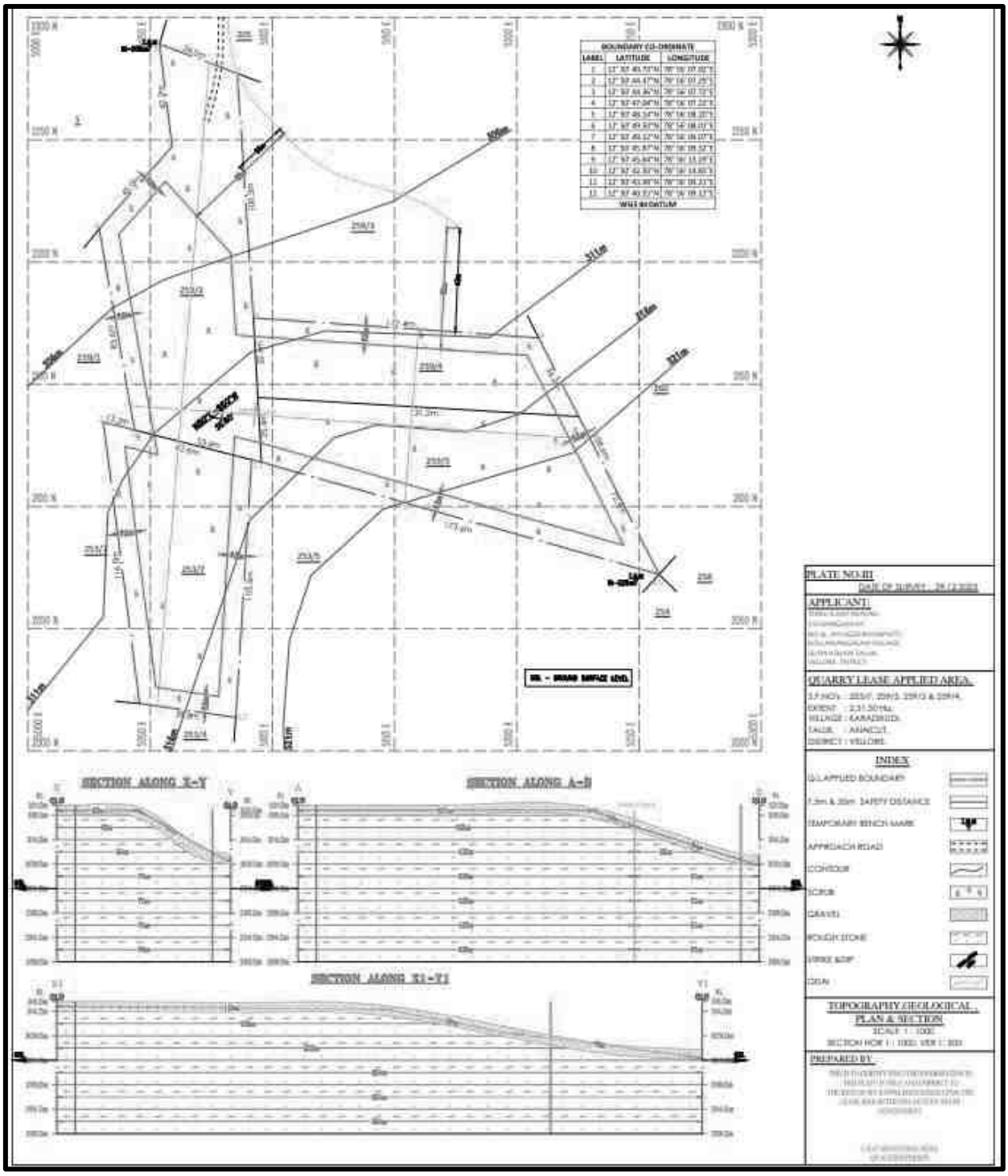


FIGURE - 2.4 GEOLOGY PLAN OF PROJECT AREA



2.3.1 PROJECT SITE LAYOUT

The proposed Mine Lease area is Patta Land and the Land use pattern of the project site is given below **Table - 2.4**.

Table - 2.4 Current Land Use Pattern

S. No.	Land Use	Present Area (Hect)	Area in use during the quarrying period (Hect)
1	Quarrying Pit	Nil	1.50.20
2	Infrastructure	Nil	0.01.0
3	Roads	Nil	0.01.0
4	Green Belt	Nil	0.20.0
5	Unutilized	2.31.50	0.59.30
	Total	**2.31.50**	**2.31.50**

2.3.2 LAND USE AT MINE CLOSURE STAGE

Table - 2.5 Land Use at Mine Closure Stage

S. No.	Land Use	Area in use during the quarrying period (Hect)
1	Area left for water body	1.50.20
2	Green Belt	0.20.0
3	Remaining area	0.61.30
Total		**2.31.50**

2.3.3 SALIENT FEATURES OF THE LEASE AREA

Sr.No	Salient Features	Description
1	Nearest Roadway	• The Nearest Railway station Gudiyattam which is about 10.22 km on Northern side of the area. • The National Highway (NH-4) Bengaluru to Chennai Highway is about 5.8 Km on Northwestern side of the area. • The State Highway (SH-122) Vellore - Odugathur about 0.34 Km on Northwestern side of the area.
2	Nearest Village	Thangal Village – 0.45 km - NE
3	Nearest Railway station	Gudiyattam– 10.22 km, N
4	Nearest Airport	Chennai International Airport – 135 km, NE

FIGURE - 2.5 TOPO MAP SHOWING EXISTING SITE FEATURES

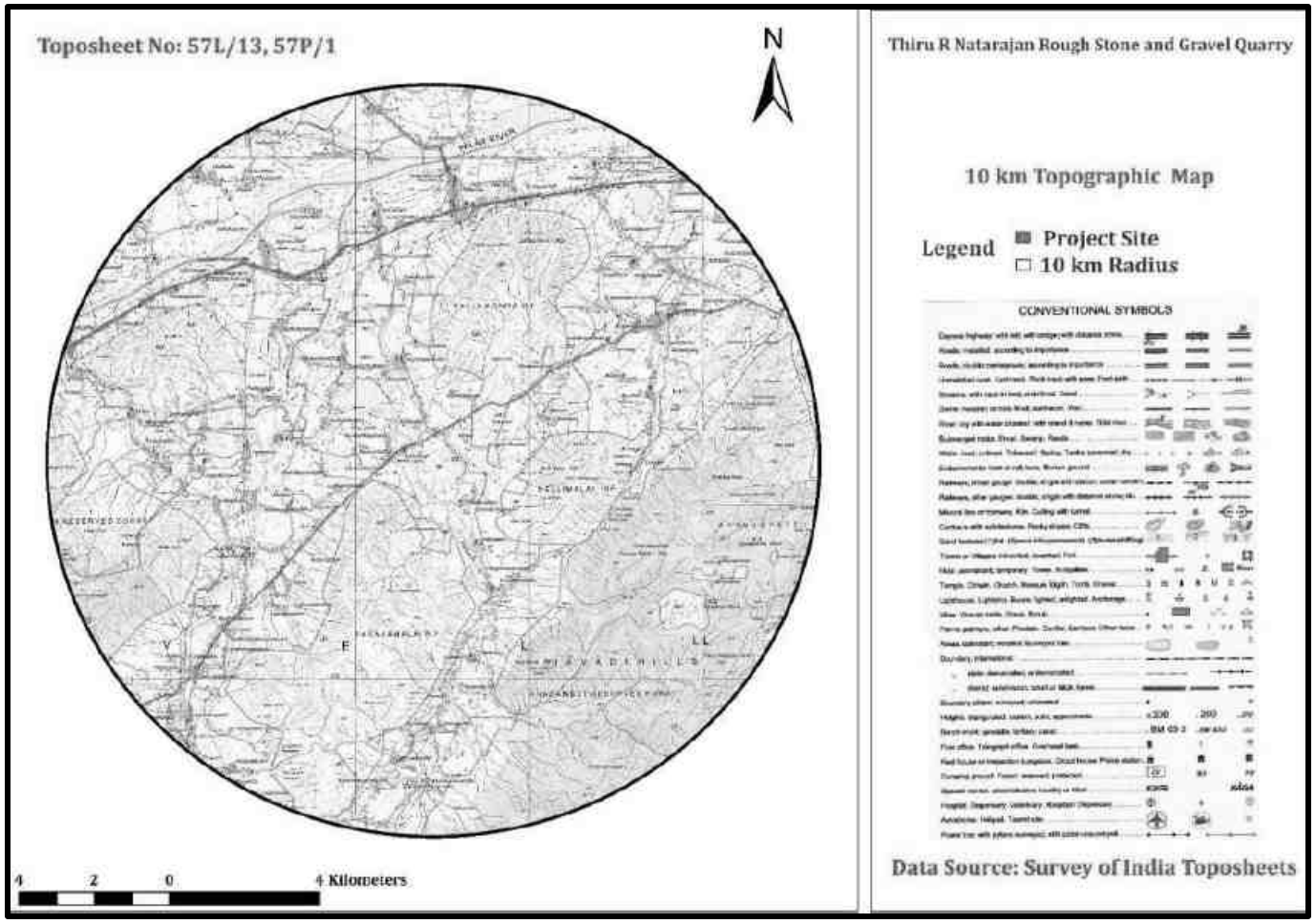
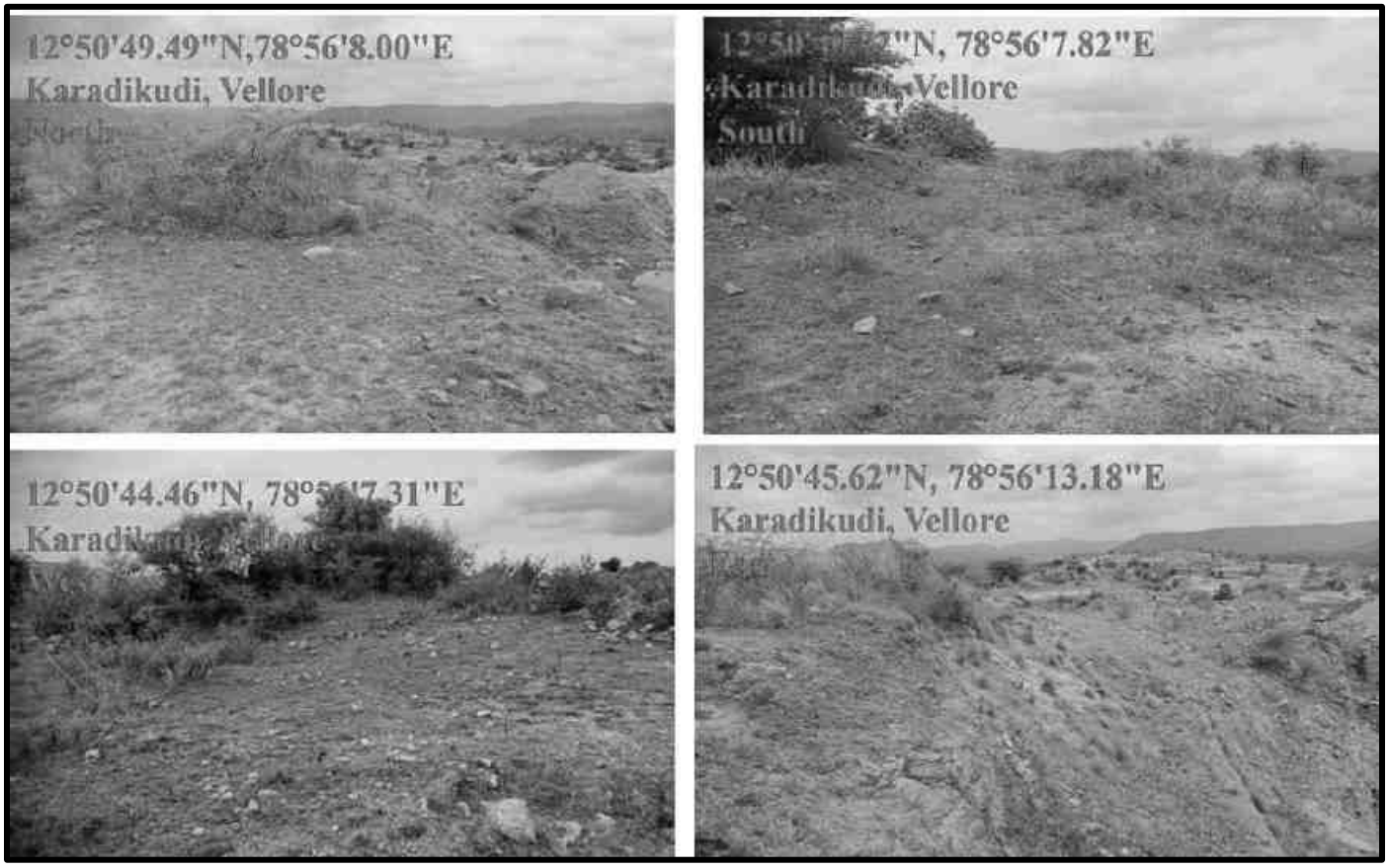


FIGURE - 2.6 PROJECT SITE PHOTOGRAPHS



2.4 SIZE OR MAGNITUDE OF OPERATION (INCL.ASSOCIATED ACTIVITIES REQUIRED BY OR FOR THE PROJECT):

Available Geological Resources observed to be 5,35,500 m^3 of Rough stone and 50,134 m^3 of Gravel and the proposed production is 2,08,760 m^3 of Rough stone and 34,184 m^3 Gravel by Opencast Mechanized mining method. The total revised Cost of the project is **290.4 Lakhs** (Including Fixed Asset + Operational & EMP cost). The revised total EMP Cost is **217.01 Lakhs** for a period of five years have been proposed.

2.4.1 STATUS OF STATUTORY CLEARANCES, PERMISSIONS, NO OBJECTION CERTIFICATES, CONSENTS:

The mining project will be implemented after getting all the Statutory Clearances, Permissions, No Objection Certificates, Consent etc. which are required/necessary for this project under various Acts, Rules and Regulations is as given in table below:

Table - 2.6 Status of Statutory Clearances, Permissions, NOC, Consents

S.No	Particular	Status
1	Mining Plan Approval Status	The project proponent has prepared mining plan under rule 19(1), 41 & 42 of Tamil Nadu Minor Mineral Concession Rules, 1959 and the same has been approved by The Assistant Director, Dept. of Geology & Mining, Vellore vide Rc.No.71/2022(Mines) dated 13.01.2023.
2	Environment Clearance Status	ToR Letter Received vide Lr.No.SEIAA-TN/F.No.9971/SEAC/ToR-1495/2023, Dated 22.06.2023
3	Grant of Consent to Establish (CTE)	After 30 days from grant of EC (Duration as per TNPCB)
4	Grant of Consent to Operate (CTO)	After 30 days from grant of EC (Duration as per TNPCB)

2.5 PROPOSED SCHEDULE FOR APPROVAL & IMPLEMENTATION

Proposed schedule for approval of the proposed mining project is given as under:

Table - 2.7 Proposed Schedule for Approval

S.NO	Activity Description	Oct 2024	Nov 2024	Dec 2024	Jan 2025
1	Submission of Final EIA/EMP Report to SEIAA-TN				
2	Consideration for EC by SEAC				
3	Recommendation of SEAC to SEIAA				
4	Grant of EC by SEIAA				

Proposed schedule has been prepared as per EIA Notification, 2006

Note: Application was submitted to Parivesh Portal on 31.03.2023, ToR was granted on 22.06.2023. Baseline data Collection during Post Monsoon Season (October 2023 to December 2023). After obtaining EC from SEIAA-TN, CTE and CTO under section 21 of the Air (Prevention and Control of Pollution) Act 1981 and section 25/26, Water (Prevention and Control of Pollution) Act 1974 will be obtained from Tamil Nadu State Pollution Control Board (TNPCB).

2.5.1 IMPLEMENTATION

Implementation of the proposed mining project will be done in accordance with the existing Acts and Rules applicable on mining operations as well as in accordance with any Act/Rule/Guidelines issued by Central or State Government from time to time and as per Mining Plan and Progressive Mine Closure Plan approved by the Assistant Director, Dept. of Geology & Mining, Vellore vide Rc.No.71/2022(Mines) dated 13.01.2023.

2.6 TECHNOLOGY & PROCESS DESCRIPTION

2.6.1 BASIC REQUIREMENTS FOR THE PROJECT

The project requirements such as water, power, man-power, fuel, machinery with source of supply is described in the sections below.

2.6.2 WATER REQUIREMENTS

In the proposed mines water will be mainly used for domestic purpose, dust suppression & plantation. Total water requirement for the project is 2.0 KLD which will be sourced from outside agencies. Negligible sewage of 0.8 KLD will be generated, for which a septic tank with soak pit will be set up. The water balance diagram is given below.

FIGURE - 2.7 WATER BALANCE DIAGRAM

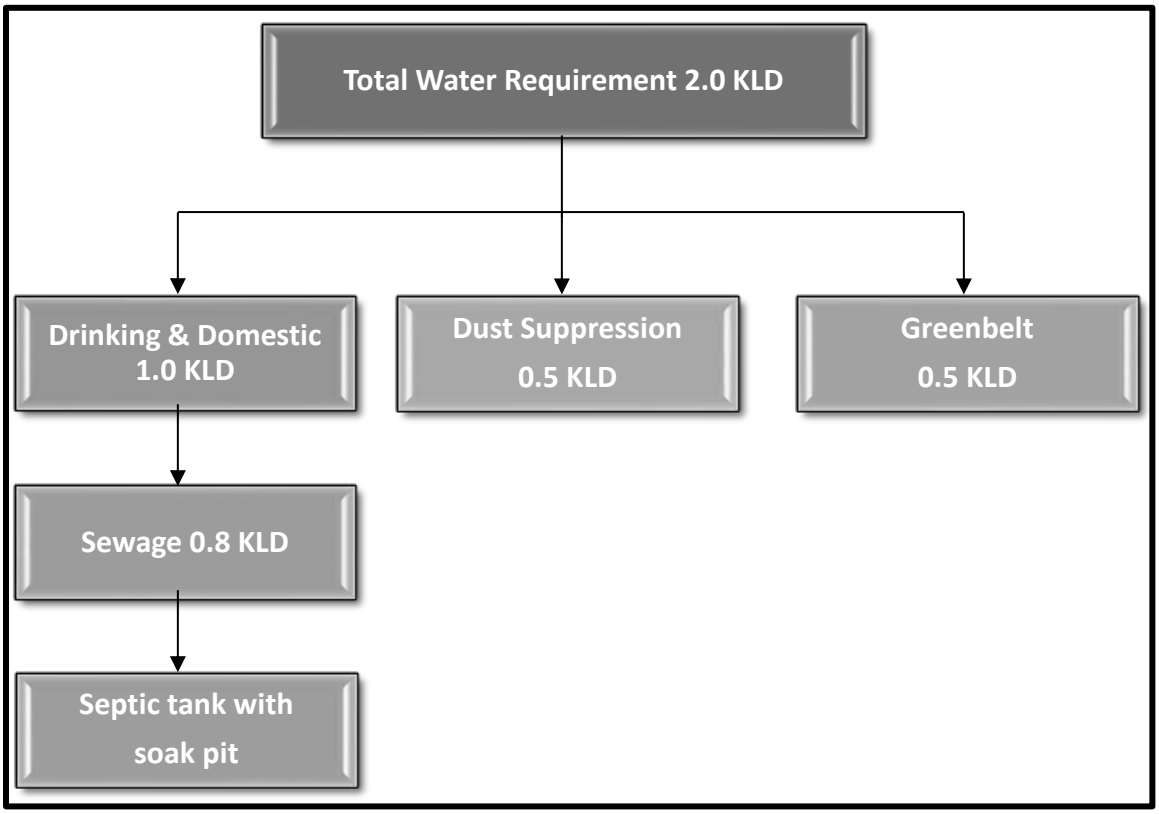


Table - 2.8 Water Requirement		
S.No	**Particular**	**Water Requirement (KLD)**
1	Drinking/Domestic	1.0
2	Dust suppression	0.5
3	Greenbelt/Plantation	0.5
Total		**2.0**

2.6.3 POWER REQUIREMENT

Total Fuel requirement is 1,72,708 Liters for entire life of the project. Power will be used only in the office building.

2.6.4 MAN POWER REQUIREMENT

Total Manpower requirement will be 24 persons. In which statutory persons will be 11 persons (Mines manager, Foreman, Mining Mate, etc.,) and other 13 persons include drivers and workman's. Preference will be given to the locals as per their eligibility.

S.No	Description	Employment potential
1	Mines Manager	1 No.
2	Foreman / Mate	1 Nos.
3	Operator	8 Nos.
4	Mechanic	1 No.
5	Driver	3 Nos.
6	Labours	10 Nos
	Total	**24 Nos**

2.6.5 EXTENT OF MECHANIZATION

Table - 2.9 Machineries involved in the project

S.No.	Particulars	capacity	Motive Power	Nos
1.	Jack hammer	32mm dia	Compressed air	6
2.	Compressor	400 psi	Diesel drive	2
3.	Excavator with Bucket and Rock Breaker	0.90 m^3	Diesel drive	1
4.	Tippers	5/10 Ts	Diesel drive	3

Source: Approved Mining Plan

Note: The mining equipment's of the above capacities are adequate for total material handling requirements for the proposed production of Rough stone in the ML area.

2.6.6 GEOLOGY AND TOPOGRAPHY

(a) Topography

The mine lease area of 2.31.50 Ha is covered in the Survey of India Toposheet 57L/13 and is bounded by Latitude: 12°50'40.55" N to 12°50'49.50" N and Longitude: 78°56'07.22" E to 78°56'14.85" E. No major river is found nearby the lease applied area. The water table is noticed at the depth of 50m. Temperature of the area is

reported to be 18^0C to a maximum of 42^0C during summer. Rainfall of this area is about 800 mm to 900 mm during the both NE & SW monsoons.

The topo map showing the lease area of the proposed quarry is given in **Figure - 2.5** and Satellite map showing proposed lease area is given in **Figure - 2.2**. The area applied for quarry lease is exhibits hilly terrain covered by Gravel formation. The massive Charnockite formation is noticed below 2m (Avg) Gravel formation and sloping towards northern side of the area, the altitude of the area is above 310m (maximum) from MSL. There is no forest land in the mine lease area. The project site is dry land which is not fit for any cropping.

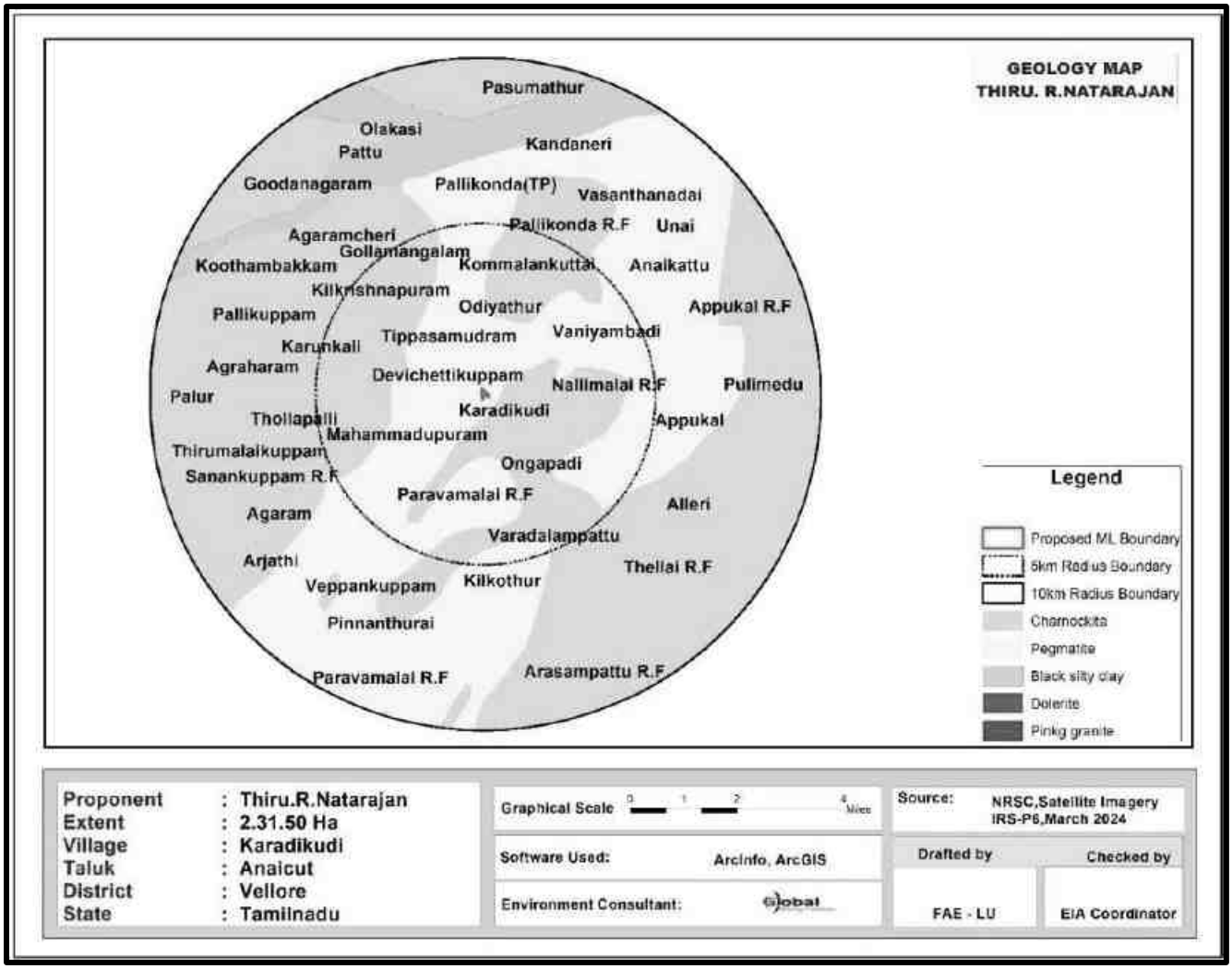
(b) Regional Geology

Vellore District comprises rocks of Satyamangalam Group and Older Supracrustal Group of Archaean Age, Charnockite and Migmatite Groups of Southern Granulite Terrain of Archaean to Proterozic age, Peninsular Gneissic Complex-II(PGC-II) of Archean to Palaeoproterozoic, basic instrusives of Mesoproterozoic age, epidote hornblende gneiss of Proterozoic, Alkali Complex and acid instrusives of Neoproterozoic age and Quaternary viz., black silty clay of Palar-Swarnamukhi Formation of Late Holocene in age. The grey hornblende-biotite gneiss of PGC-II is occurring in the north-western parts of the district.Epidote hornblende gneiss occurs as north-south trending body near Odugattur and Agaram with Charnokite Group.Charnockite is most predominant rock type at south Palar river and forms the mail hill masses and plains. Apart from Charnockite, pyroxene granulite, pink migmatite, hornblende biotite gneiss and biotite gneiss are the main lithologies observed at south of Vellore and in an around kaniyambadi. The major lithologies at north palar river near Katpadi are migmatite gneiss, pink migmatite and pink hornblende biotite granite.

Charnockite Group of rocks with interbanded sequence of pyroxene granulite and banded magnate quartzite have undergone wide spread migmatization giving rise to epidote-hornblende gneiss that show extensive shearing at the east of odugathur. Dolerite dykes occur profusely throughout the area of the district and trending NS, NE-SW and E-W with minor variations and extent over a few meters to 70m width. The granites, pegmatite, quartz and aplite veins occurs as a last phase of magmatism

and mainly intruded rocks of peninsular Gneissic Complex (PCG-II). The late Holocene active fluvial deposits is marked by black silty clay and part of Palar Swarnamukhi formation. Regional Geology map for the 10 Km radius from the proposed project site is given as **Figure - 2.8**.

FIGURE-2.8 REGIONAL GEOLOGY MAP-10 Km RADIUS FROM PROJECT AREA



(c) Local Geology

The area is underlain by the wide range of metamorphic rocks of peninsular gneissic complex. These rocks are extensively weathered and overlain by the recent valley fills and alluvium at places. The geological formations found in the district are Archaean rocks like Gneisses, Granites, Charnockites basic granulites and calc-gneisses. The younger formations are Quartz veins and pegmatite.

The rock type noticed in the area for lease is Charnockite which contains mostly Quartz and Feldspar with some ferromagnesian minerals. The Charnockite is part of peninsular Gneisses, a high-grade metamorphic rock. The strike of the Charnockite formation is $N50^0E – S50^0W$ with dipping towards $SE60^0$.

The general geological succession of the area is given as under.

AGE		ROCK TYPE
Recent	-	Gravelly soil
	Unconformity	
Archaean	-	Dolerite dyke Charnockite. Peninsular Gneissic complex And Calc Gneiss

2.7 PROJECT DESCRIPTION INCLUDING DRAWING SHOWING PROJECT LAY OUT COMPONENTS OF PROJECT ETC., SCHEMATIC REPRESENTATION OF THE FEASIBILITY DRAWING WHICH GIVE INFORMATION IMPORTANT FOR EIA PURPOSE.

2.7.1 PROCESS DESCRIPTION

(a) Proposed method of Mining

Opencast Mechanized method with 5.0 m height & 5.0m width and overall 80^0 slope of the bench. It is proposed to excavate 2,08,760 m^3 of Rough Stone and 34,184 m^3 of Gravel. No wastage is envisaged as the entire material available is Rough Stone and Gravel only.

(b) Timing

Mining will be done on single shift basis. Timing will be 8 hours from 8 AM to 1 PM and 2 PM to 5 PM. Lunch time will be provided between 1 Noon and 2 PM. Timing may be variable from season to season depending upon the sunrise and sunset. Weekly one day will be declared as holiday.

(c) Bench Geometry

Height (max) and Width (max) of the benches will be maintained as 5m each and overall slope angle will be at around 80^0 with the horizontal.

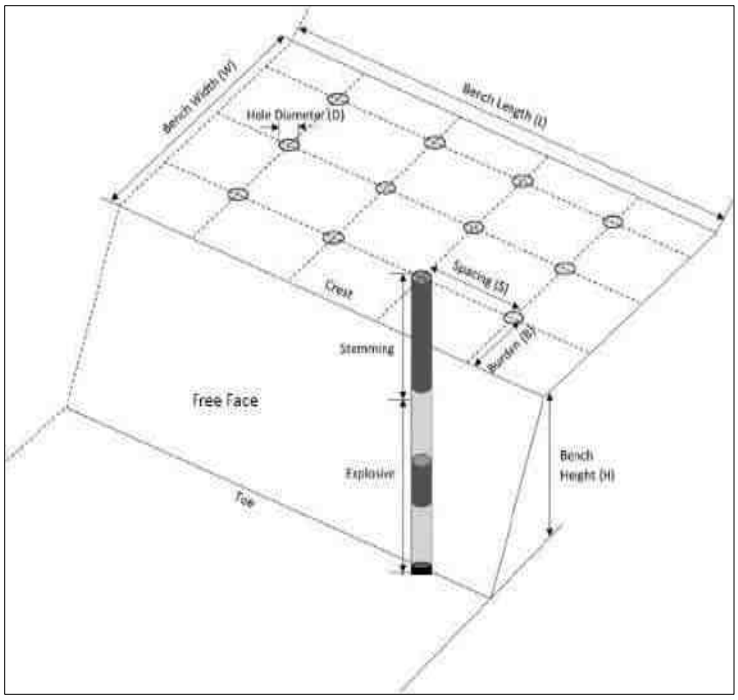
(d) Development of Mining Faces

The proposed mining method is Opencast Mechanized mining. Site preparation as such bush cleaning, approach road, office and sanitary facilities will be done after obtaining all the statutory clearances as such Environmental Clearance, Consent to Operate, Lease Deed, etc., Once site is ready will start the quarrying operation and it is anticipated in the month of March 2025.

(e) Drilling & Blasting

Drilling will be done upto maximum depth of 32m (17m AGL + 15m BGL). Jackhammer will be used for drilling with water spray. Powder factor of explosives for breaking such hard rock shall be in the order of 6 Tonnes per Kg of explosives and 60 kg explosive is proposed to be used for shattering and heaving effect for removal of Rough Stone and Gravel. The proposed blasting pattern is given as **Figure - 2.9.**

FIGURE - 2.9 BLASTING PATTERN



(f) Loading & Transportation of Rough Stone and Gravel

Hydraulic excavator will be used for lifting and loading of the Rough stone and Gravel. This excavator in combination with Tippers (5/10T) capacity of 3 nos will be used.

FIGURE - 2.10 FLOW CHART OF THE QUARRY OPERATION

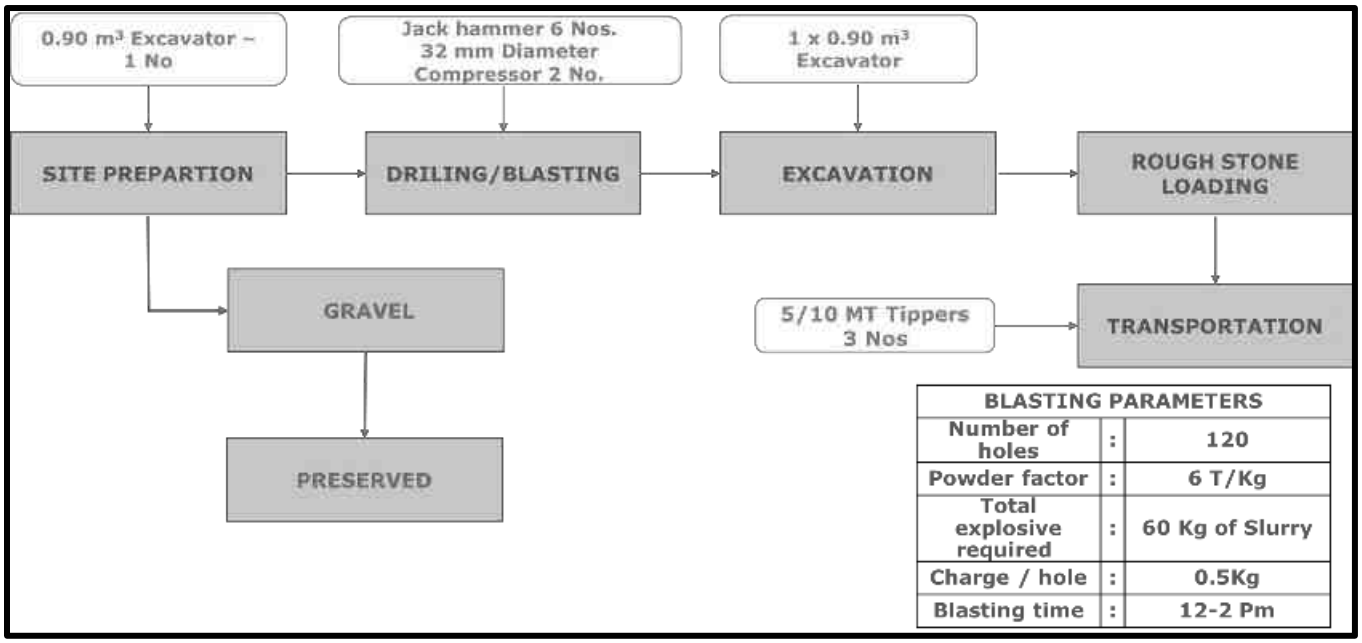


Table - 2.10 Mining Details

S.No	Description	Details	Remarks
1.	Method of Mining	Opencast method of mechanized mining with 5.0m height and 5.0m width and overall 80^0 slope of the bench. Hydraulic excavator will be used for the excavation and 5/10T tippers will be used for the Hauling.	Excavator – 1 No Tippers - 3 Nos.
2.	Mineral Use	The excavated Rough Stone and Gravel, will be usedfor construction industries for Government & Public sector projects besides catering domestic housing and infrastructure projects in and around the district	-
3.	Proposed Depth	32m	17m AGL + 15m BGL
4.	Proposed Production quantity	2,08,760 m^3 of Rough Stone 34,184 m^3 of Gravel	Five years
5.	Safety Zone	Out of total mine lease area, 0.20.0 Ha of 7.5m width will be maintained as safety zone during mining operation as well as at the conceptual stage of the project.	Around 240 nos. of saplings will be planted in this safety zone.
6.	Water requirement	2.0 KLD	Procured from the outside watervendors
7.	Energy requirement	1,72,708 liters of HSD (Entire Project Life)	All the equipment will be diesel operated. No electricity is needed for mining operation
8.	Manpower	24 Nos	
9.	Shift	General Shift	8.00 AM – 5.00 PM
10.	Project Cost	290.4 Lakhs	(Including Fixed Asset + Operational & EMP cost)

11.	EMP Cost	217.01 Lakhs	-
12.	CER Cost	As per MOEF&CC Notification CER cost is arrived for an amount of 5,00,000/- Lakhs @ 2% of the project cost.	The amount will be utilized for the development of nearby Government Schools.

2.7.2 YEAR WISE PRODUCTION & EXCAVATION DETAILS

Year wise Production of Rough stone and Gravel from the area will be upto maximum capacity. The recovery factor is up to 100% hence no waste expected to be generated. All excavated quantity is saleable. The summary of proposed development and production during the mine plan period is given in **Table - 2.11**.

Table - 2.11 Summary of production for 5 Years

Year	Section	Bench	Length in (m)	Width in (m)	Depth in (m)	Volume in m^3	Gravel in m^3	Mineable reserve of Rough stone in m^3
I	XY-AB	I	62	131	2	16244	16244	
		II	30	125	5	18750		18750
		III	37	121	5	22385		22385
						Total	**16244**	**41135**
II	X1Y1-AB	I	195	46	2	17940	17940	
		II	146	26	5	18980		18980
		III	110	42	5	23100		23100
						Total	**17940**	**42080**
III	X1Y1-AB	III	74	42	5	15540		15540
		IV	38	114	5	21660		21660
	XY-AB	V	10	108	5	5400		5400
						Total		**42600**
IV	XY-AB	V	15	108	5	8100		8100
		IV	171	35	5	29925		29925
	XIYI-AB	V	23	29	5	3335		3335
						Total		**41360**
V	XIYI-AB	V	135	29	5	19575		19575
		VI	145	22	5	15950		15950
	XY-AB	VI	12	101	5	6060		6060
						Total		**41585**
						Grand Total	**34184**	**208760**

2.7.3 CONCEPTUAL PERIOD

During conceptual stage the mined-out area will be converted into water reservoir and safety zone as well as upper benches will be used for plantation at the conceptual period. It will also serve the purpose as socio economic and corporate social

responsibility of the lessee by way of supplying water for irrigation purpose or at will of the local people. This will help in ground water recharging as well. The conceptual plan and section of mine lease area is given in **Figure - 2.11 & 2.12**. Ultimate extent and size of the quarry at the conceptual stage is given below as **Table - 2.12** and Land Use pattern is given as **Table - 2.13**.

Table - 2.12 Ultimate Pit Dimension			
Pit No.	**Length (max) (m)**	**Width (Avg) (m)**	**Depth (max) (m)**
I	195	77	32m (17m above ground level and 15m Below ground level)

Table - 2.13 Land Use At Mine Closure Stage		
S. No.	**Land Use**	**Area in use during the quarrying period (Ha)**
1	Area left for water body	1.50.20
2	Green Belt	0.20.0
3	Remaining area	0.61.30
Total		**2.31.50**

FIGURE - 2.11 CONCEPTUAL PLAN

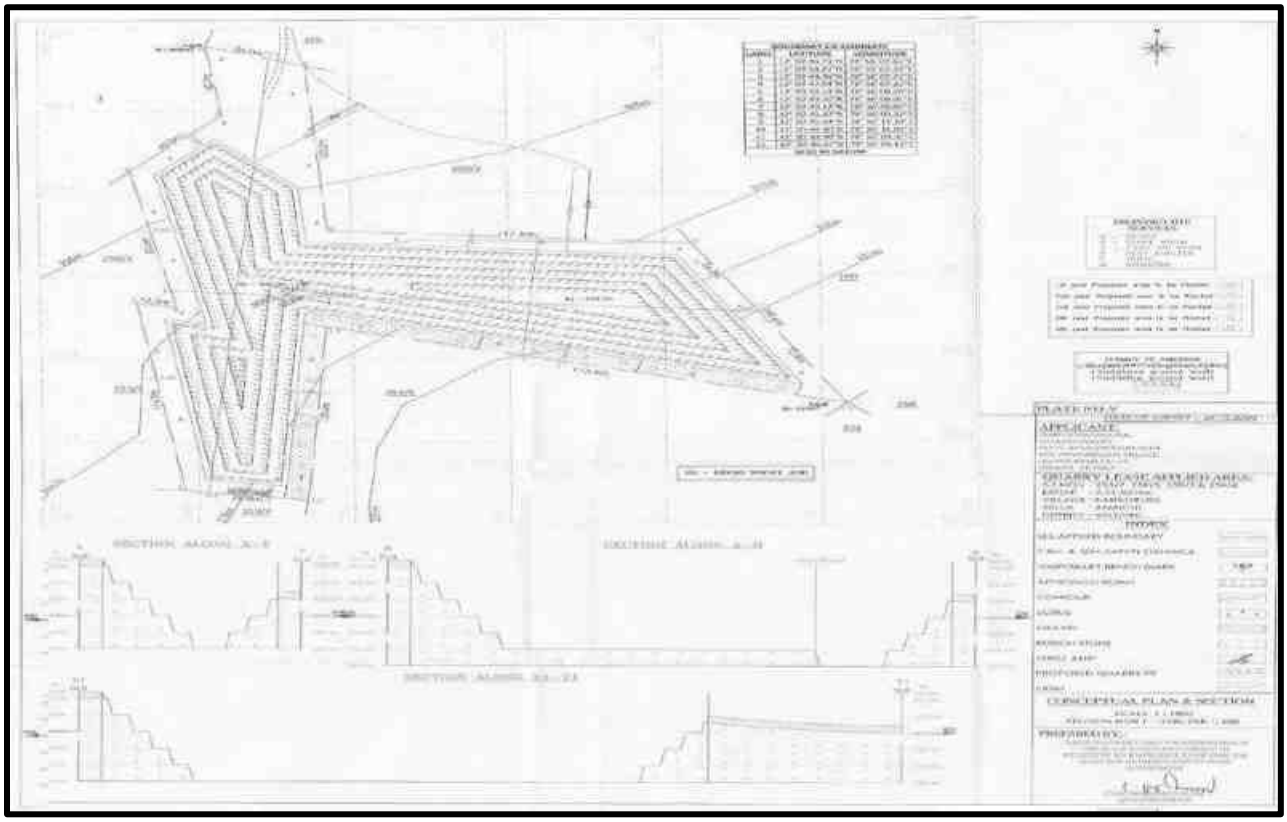


FIGURE - 2.12 CONCEPTUAL SECTION



2.8 DESCRIPTION OF MITIGATION MEASURES INCORPORATED INTO THE PROJECT TO MEET ENVIRONMENTAL STANDARDS ENVIRONMENTAL OPERATING CONDITIONS, OR OTHER EIA REQUIREMENTS (AS REQUIRED BY THE SCOPE)

The mitigation measures given in this section are for management of the emissions (particulate or gaseous), Noise pollution, wastewater & surface run-off generated from the mining operations to meet the environmental standards and environmental operating conditions are as follows:

2.8.1 AIR QUALITY MANAGEMENT

(a) Drilling

Drilling machines are proposed to be equipped with wet drilling arrangements and cyclone dust collectors.

(b) Blasting

- Controlled blasting is proposed to be adopted and optimum use of explosive energy will help in reducing the air pollution.
- Secondary blasting will be avoided.

- Rock breakers are proposed to be used for breaking oversized boulders in order to reduce the dust generation.
- Use of good quality of explosives having proper oxygen balance with regular monitoring.
- Ensuring proper stemming after charging of explosives. Proper stemming material will help in minimizing dust throw thereby lowering the spread of dust particles in ambient air pollution.
- Water spray on blasted muck pile before dozing/loading to control dust generation.

(c) Loading & Transportation

- Water spray on haulage roads, access roads, operating benches and proper maintenance of haul roads.
- Development of green belt/plantation around mine boundary, roads and other places will be carried out to control the air pollution.
- Proper maintenance of the HEMMs & transportation vehicles will be done.
- Vehicular emissions will be kept under norms.
- Personal Protective Equipment like dust masks will be provided to all employees. ➢ Regular air quality monitoring will be carried out.
- Compliance of conditions laid by MoEF&CC and TNPCB to minimize environmental impacts

2.8.2 NOISE MANAGEMENT

(a) Drilling

- Drilling with sharp drill bits to achieve optimum drilling performance and to reduce noise generation at source will be adopted.
- Personal protective equipments i.e. earplug in drilling & in high noise area shall be used.

(b) Blasting

- As blasting will be done in accordance with standards prescribed by DGMS for controlled blasting; therefore, ground vibrations will not affect the structures in the vicinity of mine area.

- Explosives charge per hole and per delay will be maintained as per DGMS guidelines.
- Blasting will be carried out by use of non-electric detonators (NONEL) system and the impacts of noise generated due to blasting are momentary.
- Vibrations and noise generated by blasting will be monitored regularly

(c) Transportation

- Adequate silencers in HEMMs will be provided to reduce generation of noise.
- Proper and regular maintenance, oiling and greasing of machines at regular intervals will be done to reduce generation of noise.
- All HEMMs will be equipped with acoustic a/c closed cabins for operators.
- The workers employed at HEMMs will be provided with protective equipment, earmuffs and earplugs as protective measures from the high noise level generated at the mine site and wherever required.
- Development of green belt & plantation around the mining activity and other areas, will be carried out.
- Regular monitoring of noise will be carried out.

2.8.3 WATER MANAGEMENT

(a) Waste Water

Septic Tanks and soak pits will be provided for the disposal of effluent generated from mine office.

(b) Surface Run-off

- Garland drains are proposed to be constructed around the temporary overburden soil dump to channelize the runoff water from dumps and also around the active pit to restrict rainy water from entering in to the working pit.
- Rain water falling directly into the mine pits will be stored and used for plantation & dust suppression.
- Regular monitoring of water quality will be carried out

2.8.4 GREENBELT/ PLANTATION

The mine lease area is devoid of major plantation. Shrubs and bushes are majorly found within the lease area. The proponent has planned to develop Green belt/Plantation by planting 1,160 Saplings. Out of this, 240 saplings will be planted

in the safety zone area of 0.20 Ha for the period of 5 year and remaining 920 saplings will be planted outside the lease area such as at project surrounding schools, temples, road sides, etc.

2.9 ASSESSMENT OF NEW & TESTED TECHNOLOGY FOR THE RISK OF TECHNOLOGICAL FAILURE:

From the nature and extent of the deposit, the reserves and the quality have been proved with adequate degree of reliability. Considering the type of mineralization, opencast mechanized method is the most feasible method for mining in the proposed mine lease. It is also a matter of fact that the mining machineries are upgrading with time and therefore the project proponent would act fast to adopt more advanced equipment and automation for safe and environment friendly mining technology in the years to come.

*****

CHAPTER -3

DESCRIPTION OF THE ENVIRONMENT

3.1 STUDY AREA, PERIOD COMPONENTS AND METHODOLOGY

The project area is located in Karadikudi Village, Anaicut Taluk, Vellore District, Tamil Nadu State over an extent of 2.31.5 Ha. The project area is considered as Core zone and the area in the surrounding 10km radius is considered as Buffer Zone. The baseline environmental monitoring was conducted by M/s. Shrient Analytical & Research Labs Private Limited, Chennai it is an NABL and MOEF recognized laboratory for various components of environment, viz. Air, Noise, Water, Land was carried out during Post Monsoon Season i.e. October 2023 to December 2023 in the study area covering 10 km radial distance from the Rough stone and Gravel mine. Other environmental data on flora and fauna, land-use pattern, forest etc. were also generated through field surveys and secondary information collected from different State Govt. departments. Socio-economic survey was conducted, through interaction with the people, sarpanch and medical officers by floating questionnaires and collection of information are supported by census data for demographic structures, amenities, and infrastructure availability within the study area. Baseline values for various environmental components are discussed in this Chapter.

3.1.1 ENVIRONMENTAL SETTING OF THE STUDY AREA

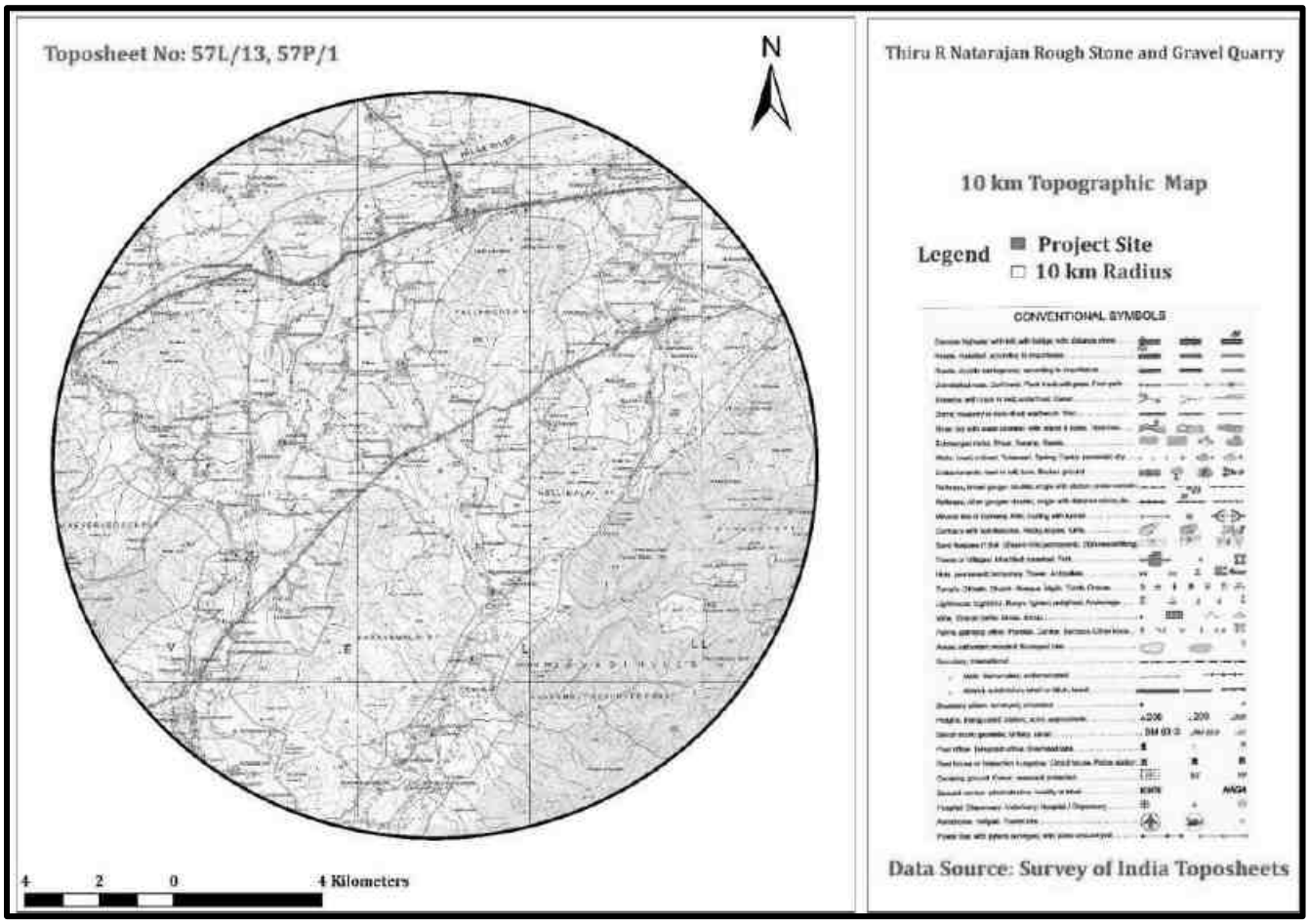
Table - 3.1 DESCRIPTION OF THE LEASE AREA

S.No.	Areas	Distance from project site		
1	Areas protected under international conventions, national or local legislation for their ecological, landscape, cultural or other related value	Nil within 15km radius		
2	Areas which are important or sensitive for ecological reasons			
A	Wetlands, water courses or other water bodies,	**Water bodies**	**Distance**	**Direction**
		Odiyathur lake	1.02 kms	N
		Chinna Eri	2.65 kms	W
		Periya Eri	2.0 kms	NW
		Narayanaburam lake	3.90km	NE

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<table>
<tr><td>Nallurpet lake</td><td>13.53km</td><td>NW</td></tr>
<tr><td>Mel Kavanur lake</td><td>10.26km</td><td>NE</td></tr>
<tr><td>Vasanthanadai lake</td><td>8.20km</td><td>NE</td></tr>
<tr><td>Sathiyamangalam Eri</td><td>10.80 km</td><td>NE</td></tr>
<tr><td>Poigai pond</td><td>14.35km</td><td>NE</td></tr>
<tr><td>Pallikonda Lake</td><td>5.73km</td><td>N</td></tr>
<tr><td>Agaram Aru</td><td>4.30km</td><td>NW</td></tr>
<tr><td>Palar</td><td>7.44km</td><td>N</td></tr>
<tr><td>Bahuda River</td><td>7.50km</td><td>N</td></tr>
</table>
</td></tr>
<tr><td>B</td><td>Coastal zone, biospheres</td><td>Nil within 10km radius</td></tr>
<tr><td>C</td><td>Mountains, forests, Sanctuary</td><td>
<table>
<tr><th>Forest</th><th>Distance</th><th>Direction</th></tr>
<tr><td>Pallikonda RF</td><td>2.23km</td><td>N</td></tr>
<tr><td>Nallimalai RF</td><td>2.47km</td><td>E</td></tr>
<tr><td>Paravamalai RF</td><td>2.37km</td><td>S</td></tr>
<tr><td>Sanankupppam RF</td><td>6.37km</td><td>SW</td></tr>
<tr><td>Arasampattu RF</td><td>5.41km</td><td>SE</td></tr>
<tr><td>Pudukuppam RF</td><td>10.41km</td><td>S</td></tr>
<tr><td>Puthur RF</td><td>14.66km</td><td>S</td></tr>
<tr><td>Karuthamalai RF</td><td>11.92km</td><td>SW</td></tr>
<tr><td>Thellai RF</td><td>12.55km</td><td>SE</td></tr>
<tr><td>Athiyur RF</td><td>12.31km</td><td>E</td></tr>
<tr><td>Kailasagira RF</td><td>13.49km</td><td>E</td></tr>
<tr><td>Koundinya Wildlife Sanctuary</td><td>19.60km</td><td>NW</td></tr>
</table>
</td></tr>
<tr><td>3</td><td>Areas used by protected, important or sensitive species of flora or fauna for breeding, nesting, foraging, resting, overwintering, migration</td><td>Nil within 15km radius</td></tr>
<tr><td>4</td><td>Inland, coastal, marine or underground waters</td><td>Nil within 15km radius</td></tr>
<tr><td>5</td><td>State, National boundaries</td><td>Nil within 15km radius</td></tr>
<tr><td>6</td><td>Routes or facilities used by the public for access to recreation or other tourist, pilgrim areas</td><td>Nil within 15km radius</td></tr>
<tr><td>7</td><td>Defense installations</td><td>Nil within 15km radius</td></tr>
<tr><td>8</td><td>Densely populated or built-up area</td><td>Odiyathur (2.26 Km -N)</td></tr>
</table>

9	Areas occupied by sensitive man-made land uses (hospitals, schools, places of worship, community facilities)	Odiyathur (2.26 Km -N)
10	Areas containing important, high quality or scarce resources (ground water resources, surface resources, forestry, agriculture, fisheries, tourism, minerals)	Nil
11	Areas already subjected to pollution or environmental damage. (those where existing legal environmental standards are exceeded)	Nil
12	Areas susceptible to natural hazard which could cause the project to present environmental problems (earth quakes, subsidence, landslides, erosion, flooding or extreme or adverse climatic conditions) similar effects	No. The area is not prone to earthquakes, floods, etc.

FIGURE - 3.1 ENVIRONMENTAL SETTING OF THE STUDY AREA



3.1.2 STUDY PERIOD

The relevant information and data (both primary and secondary) were collected in core as well as buffer zone (10 km distance from the mine boundary) during Post Monsoon Season (October 2023 to December 2023) in accordance with the guidelines for preparation of EIA studies in order to assess the impact of the mine site within the 10 Km study area on existing physical, biological and social environment.

3.2 ESTABLISHMENT OF BASELINE FOR VALUED ENVIRONMENTAL COMPONENTS:

Information on the following components/parameters were collected to understand the existing scenario of the core and buffer area:

- Meteorological environment
- Air environment
- Water environment

- Noise environment
- Soil environment
- Biological environment
- Land use & Land cover
- Socio economic environment
- Hydrogeology

3.2.1 BASELINE DATA COLLECTION

Baseline environment data on various components of the environment in the study area were collected during Post Monsoon Season (October 2023 to December 2023) to assess the present scenario of the area. Details are given in the table below.

Sr.No	Environmental Component	Primary data		
		Parameters	Frequency	Monitoring /Sampling locations
1	Land	Agriculture, Habitation, Industry, Stony waste/ Quarries, Forest area, Plantation/ Vegetation, Open scrub, Water bodies etc.	Once in a Season	10 km radius study area
2	Meteorology	Temperature, Relative Humidity, Wind Speed, Wind Direction.	Hourly	1
3	Air	PM10, PM2.5, SO2, NO2 & CO PAH	twice a week (24 hourly)	6
4	Noise	Equivalent noise levels in Leq in dB (A)	Once in a season (day & night time)	6
5	A. Surface Water	Parameters as per IS: 2296 (Class-A)	Once in a season	3
	B. Ground Water	Parameters as per IS 10500:2012	Once in a season	6
6	Soil	Parameters As per IS 2720/USDA	Once in a season	3
7	Biological Environment	Flora and Fauna	Once in a season	Study Area
8	Socio- Economic Environment	Socio-Economic Environment	Once in a season	Study Area

3.2.2 INSTRUMENTS USED FOR ENVIRONMENTAL BASELINE DATA COLLECTION

The following instruments were used at the site for environmental baseline data collection work.

- Respirable Dust Sampler with attachment for gaseous Pollutants, Envirotech APM 460.
- Fine Particulate Matter (FPS) Sampler APM 550
- Sound Level Meter Model CENTER – C - 322
- Digital D.O. Meter Model – BW SOLO
- Weather Monitoring Station Model Enviro WM 271
- Water Level Indicator and
- Global Positioning System (GPS) Apart from collecting samples of air, water, noise and soil from representative sampling points given in proceeding sections, the data on land use, vegetation and agricultural crops were also collected by the field team through interaction with a large number of local inhabitants of the study area and different Government departments/agencies. This provided an excellent opportunity to the members of the field team for obtaining clear scenario of the existing environment of the study area.

3.2.3 BASE MAP OF ALL ENVIRONMENTAL COMPONENTS

(a) Enumeration of the Structures located within 1.0 Km radius from the Proposed Quarry Site

A site survey has been conducted to identify and list structures located within a 1 Km radius from the proposed Quarry and are detailed below. There are permanent structures within a 1 km radius from the project site. The PP has obtained a letter from Village Administrative Office (VAO), Karadikudi stating that there are no structures situated within 300 m radius (**Refer Annexure - 4**).

FIGURE - 3.2 BASE MAP SHOWING 50M INTERVAL FOR 1KM RADIUS FROM THE LEASE AREA

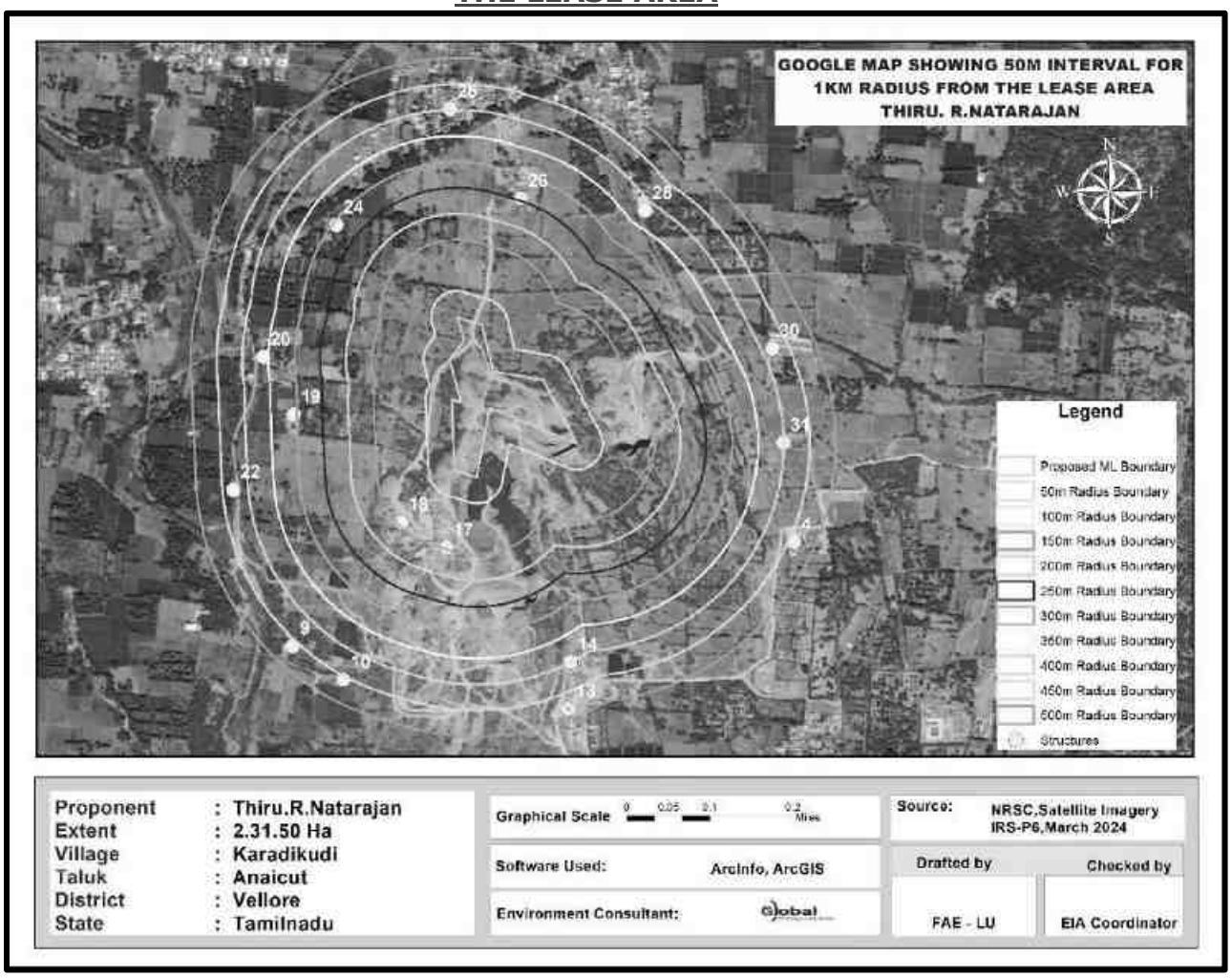
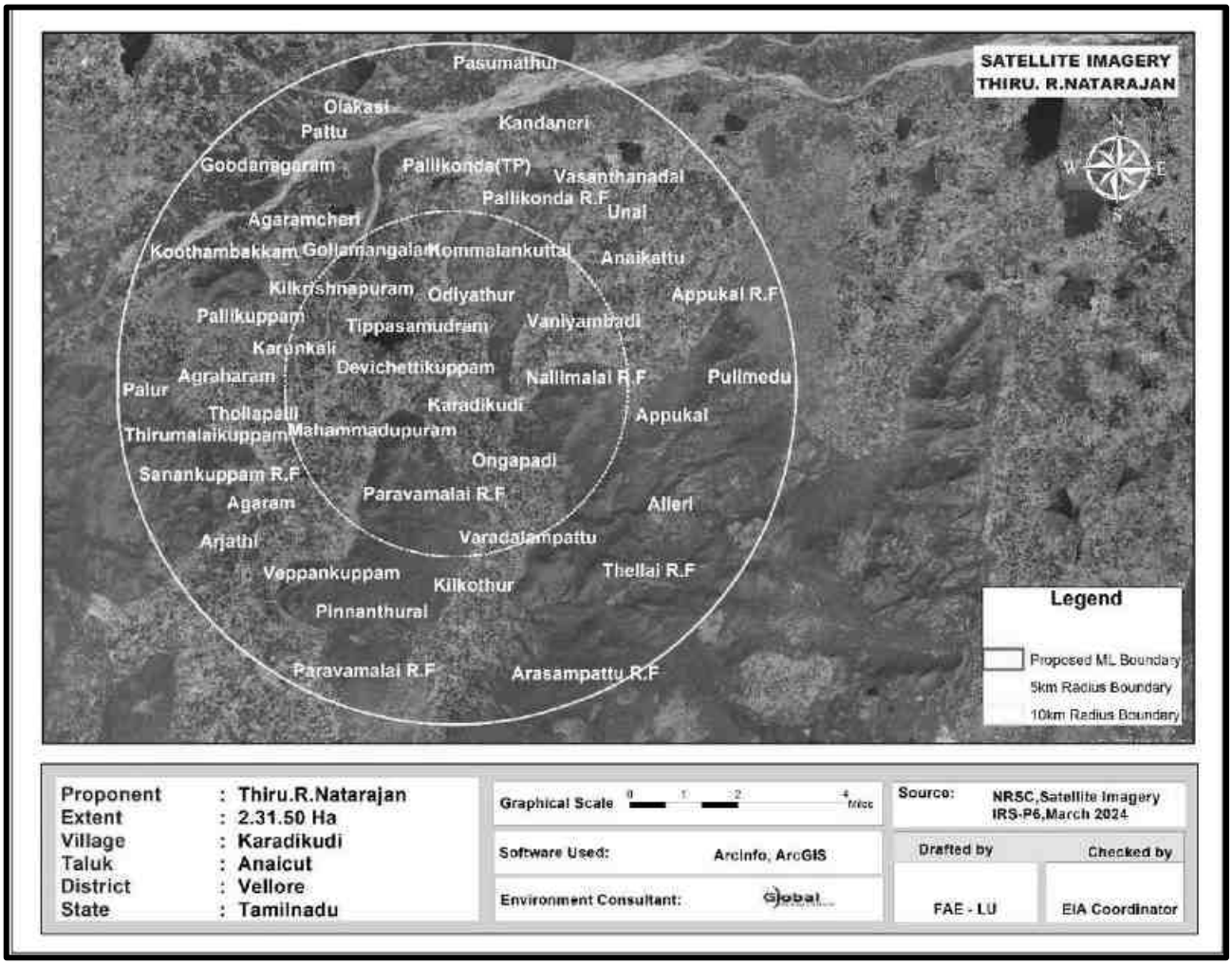


FIGURE - 3.2a SATELLITE MAP OF THE PROJECT AREA (10 KM RADIUS)



3.3 ENVIRONMENTAL BASELINE DATA

3.3.1 METEOROLOGICAL ENVIRONMENT

Meteorological conditions prevailing in the buffer zone is given below

(a) Climate

The climate of Vellore District is tropical. The period from the weather is pleasant during the period from November to January. The normal temperature varies between 18^0C to a maximum of 42^0C during summer, whereas the hottest climate experiences from Post Monsoon Season (October 2023 to December 2023) with mercury reaching 38.5°C at the highest.

(b) Rainfall

Vellore district generally experiences hot and humid climate conditions. The district receives rain under the influence of both southwest and northeast monsoons. Most of the precipitation occurs in the form of cyclonic storm caused due to depressions in Bay of Bengal chiefly during NE monsoon period. The SW monsoon is highly erratic and summer rains are negligible. Rainfall of this area is about 800 mm to 900 mm during both NE & SW monsoons. The excess rainfall is 192% (Source: Mausam.imd.gov.in). Rainfall received from 2017 to 2021 is given below.

Table - 3.2 Rainfall data

Actual Rainfall in mm					Normal rainfall in mm
2017	2018	2019	2020	2021	
1231.8	750.3	1022.6	1077	1521.2	980

(c) Relative Humidity

The relative humidity, in general around the year is between 55 and 65% in most parts of the district, except during the north-east monsoon season when it is over 65%. However, the coastal areas will be comparatively more humid.

(d) Seismic information

The study area falls in Zone III, which comes under the moderate zone. The seismic map of India is given as **Figure - 3.3**.

FIGURE - 3.3 SEISMIC MAP OF INDIA

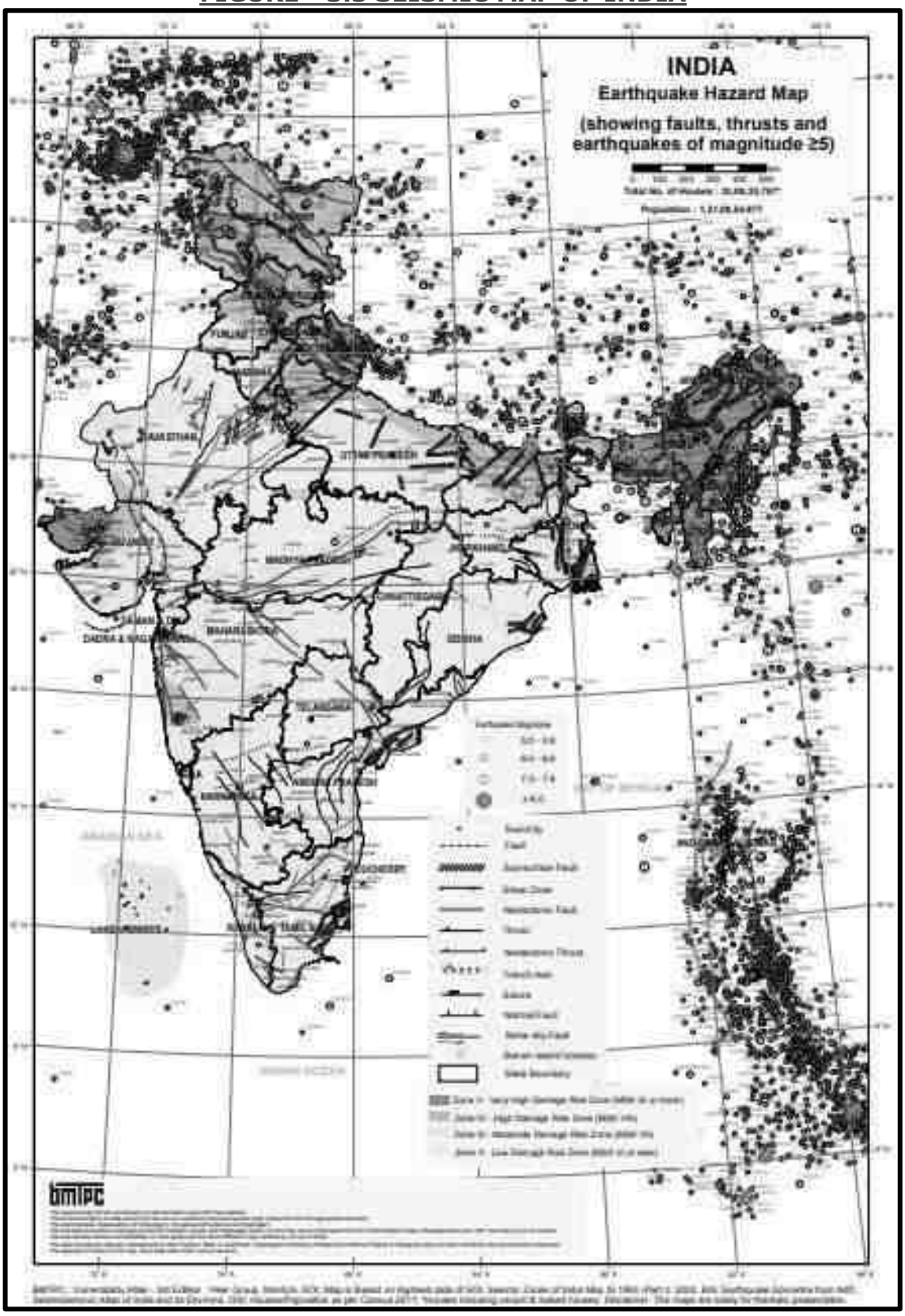
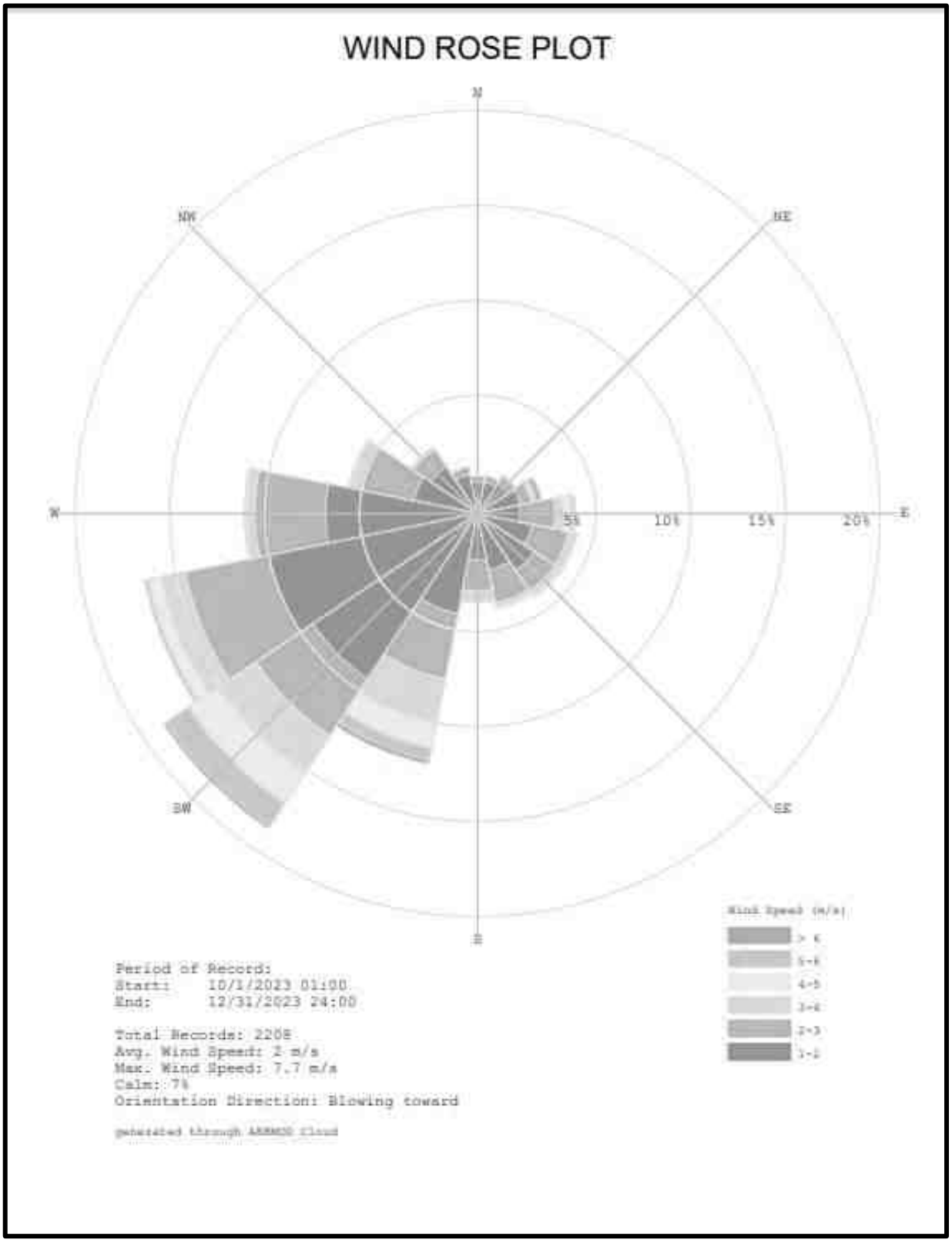


FIGURE - 3.4 WIND ROSE PLOT DURING OCTOBER 2023 TO DECEMBER 2023



(e) Meteorological data of the project area

The meteorological data collected in the study area from October 2023 to December 2023 which includes Temperature, Wind speed, Wind direction and Relative humidity. The predominant wind blows from West. The temperature of the area is reported to be 24.4°C and 27.1°C during summer.

3.3.2 AMBIENT AIR MONITORING DATA

Ambient air quality monitoring has been carried out in 6 locations. One in the core zone and remaining five locations in the buffer zone areas. Monitoring locations have been chosen such that the measurement represents the overall air condition prevailing in the area. The study area represents mostly rural environment with stone mining quarries & crushers.

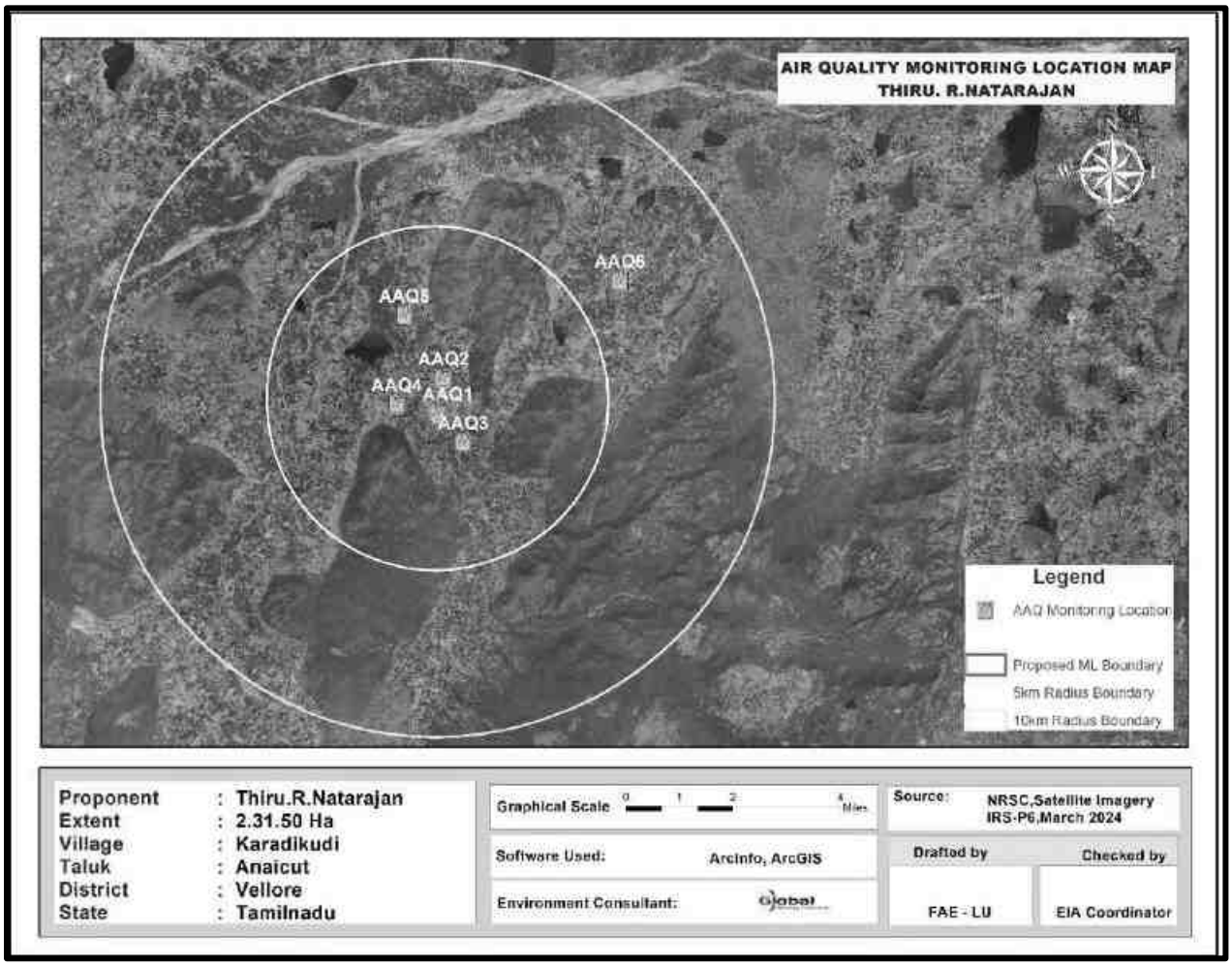
The regional climatologically data, was used as a guideline to know the predominant wind direction during study period. The locations were identified keeping in view predominant wind directions prevailing during study period, sensitive receptors, human settlements, and mining activities around.

The levels of Respirable Particulate Matter (PM10), Fine Particulates (PM2.5), Sulphur Dioxide (SO2) and Oxides of Nitrogen (NOx) were monitored for establishing the baseline status. PM10 were sampled with the help of Respirable Dust Samplers on filter papers and SO2 & NOx were absorbed in the respective absorption media in the impingers attached to RD samplers and analyzed Spectro-photometrically. PM2.5 was monitored with the help of Fine Particulate Samplers. The monitoring locations for ambient air study are given in **Table - 3.3** and **Figure - 3.5** below.

Table - 3.3: Details of Ambient Air Quality Monitoring Locations

S. No.	Station Code	Locations	Distance & Direction	Coordinates
1	AAQ1	Within Mine Lease area	Core Zone	12°50'40.55"N 78°56'09.12"E
2	AAQ2	Thangal	0.64 km, N	12°51'04.18"N 78°56'17.48"E
3	AAQ3	Pichanatham	1.38 km, SE	12°50'2.02"N 78°56'36.06"E
4	AAQ4	Karadikudi	1.02 km, W	12°50'39.03"N 78°55'31.26"E
5	AAQ5	Odiyathur	2.65 km, NW	12°52'7.05"N 78°55'39.56"E
6	AAQ6	Anaicut	5.92 km, NE	12°52'36.81"N 78°59'14.06"E

FIGURE - 3.5 BASE MAP OF AMBIENT AIR MONITORING LOCATIONS



The concentrations of various air pollutants at the 6 locations are given below. For all the components in the table, the unit are in $\mu g/m^3$.

Table - 3.4 Results of Air Sampling Analysis in 6 locations			
Station ID	**Min**	**Max**	**Avg.**
Particulate matter PM_{10} ($\mu g/m^3$)			
AAQ-1	52.6	64.7	58.65
AAQ-2	46.1	56.2	51.15
AAQ-3	41.1	52.5	46.8
AAQ-4	44.6	59.2	51.9
AAQ-5	45.2	59.3	52.25
AAQ-6	44.4	55.2	49.8
CPCB NAAQS 2009 for PM_{10} - 100 $\mu g/m^3$			
Particulate matter $PM_{2.5}$ ($\mu g/m^3$)			
AAQ-1	24.1	30.5	27.3
AAQ-2	20.9	27.1	24
AAQ-3	18.7	28.1	23.4
AAQ-4	21.1	29.7	25.4
AAQ-5	20.8	27.1	23.95
AAQ-6	20.2	24.8	22.5
CPCB NAAQS 2009 for $PM_{2.5}$ - 60 $\mu g/m^3$			
Sulphur Di-oxide as SO_2 ($\mu g/m^3$)			
AAQ-1	4.1	6.4	5.25
AAQ-2	4.1	6.8	5.45
AAQ-3	4.0	6.4	5.2
AAQ-4	4.2	8.8	6.5
AAQ-5	4.4	7.8	6.1
AAQ-6	4.1	6.5	5.3
CPCB NAAQS 2009 for SO_2 – 80 $\mu g/m^3$			
Oxide of Nitrogen as NO_2 ($\mu g/m^3$)			
AAQ-1	8.7	11.2	9.95
AAQ-2	7.3	9.1	8.2
AAQ-3	6.2	8.4	7.3
AAQ-4	8.2	12.5	10.35
AAQ-5	7.7	10.2	8.95
AAQ-6	6.4	9.5	7.95
CPCB NAAQS 2009 for NO_2 – 80 $\mu g/m^3$			

The results are summarized in graph and given as below **Figure - 3.6 to 3.11**.

FIGURE - 3.6 AMBIENT AIR QUALITY DATA A1 - MINE LEASE AREA

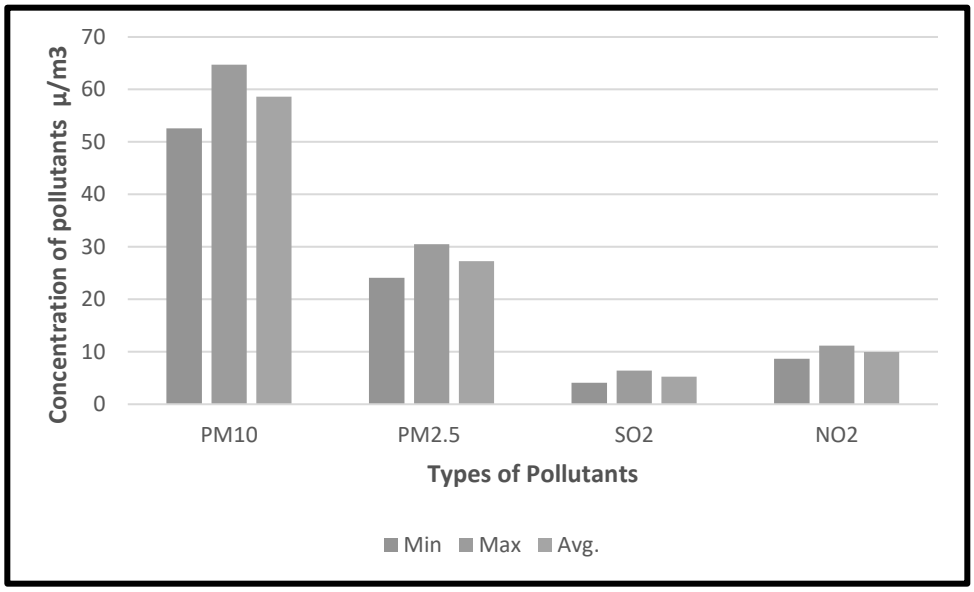


FIGURE - 3.7 AMBIENT AIR QUALITY DATA A2 - THANGAL VILLAGE

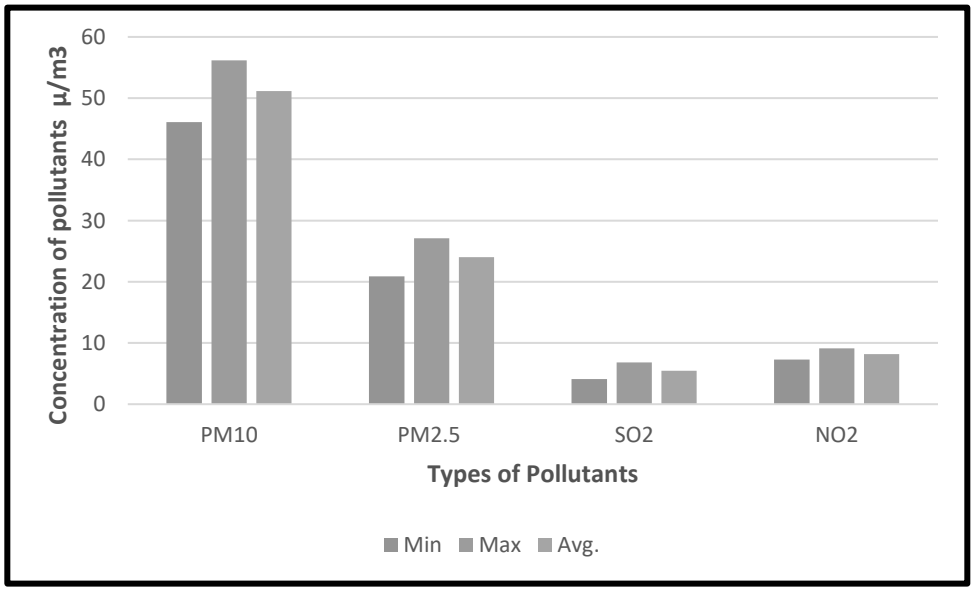


FIGURE - 3.8 AMBIENT AIR QUALITY DATA A3 - PICHANATHAM VILLAGE

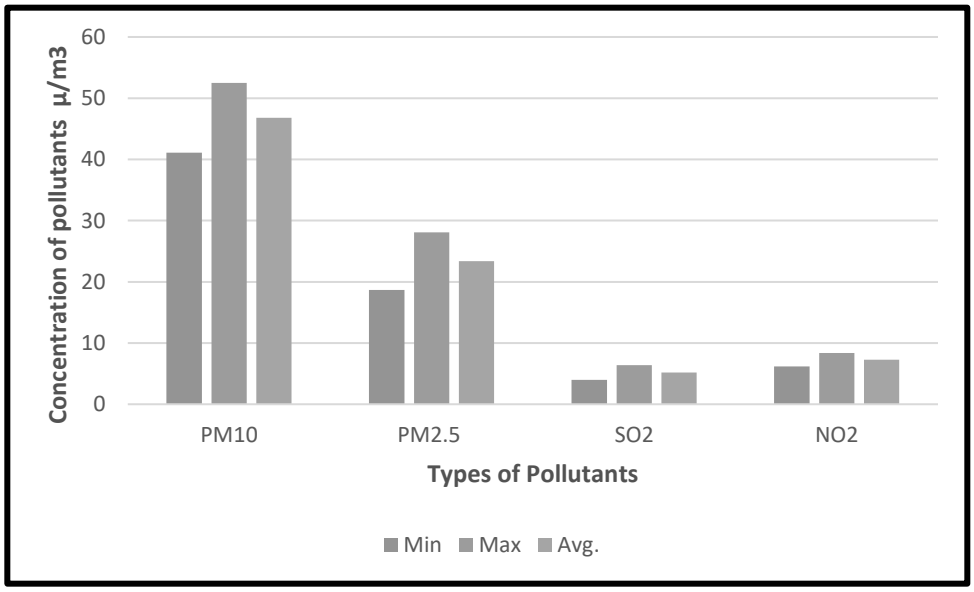


FIGURE - 3.9 AMBIENT AIR QUALITY DATA A4 - KARADIKUDI VILLAGE

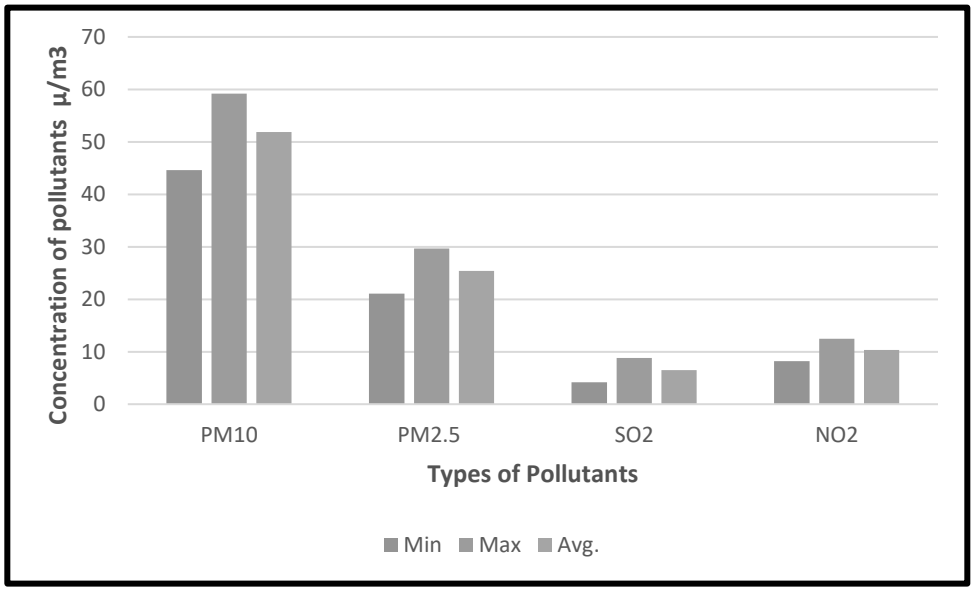


FIGURE - 3.10 AMBIENT AIR QUALITY DATA A5 - ODIYATHUR VILLAGE

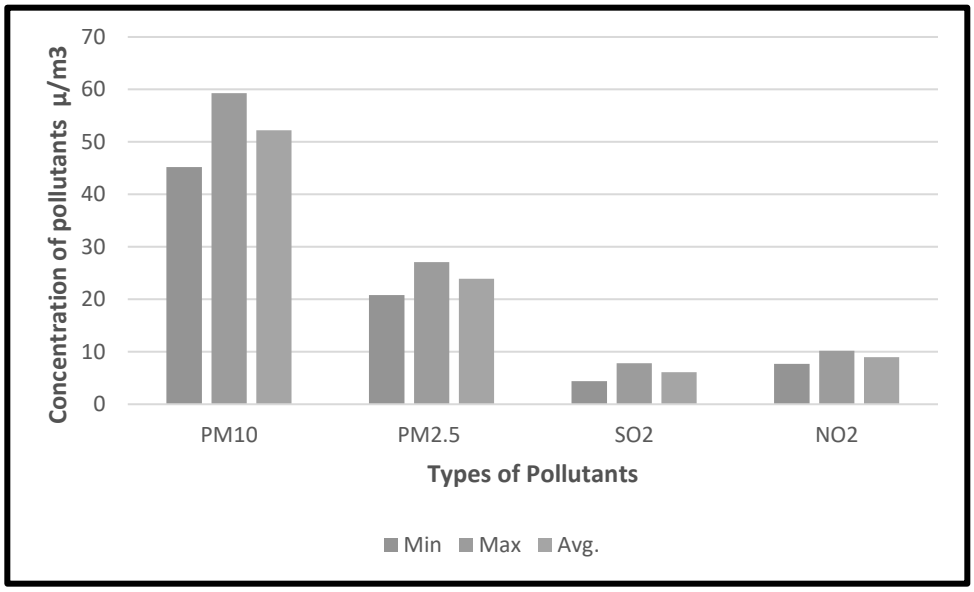
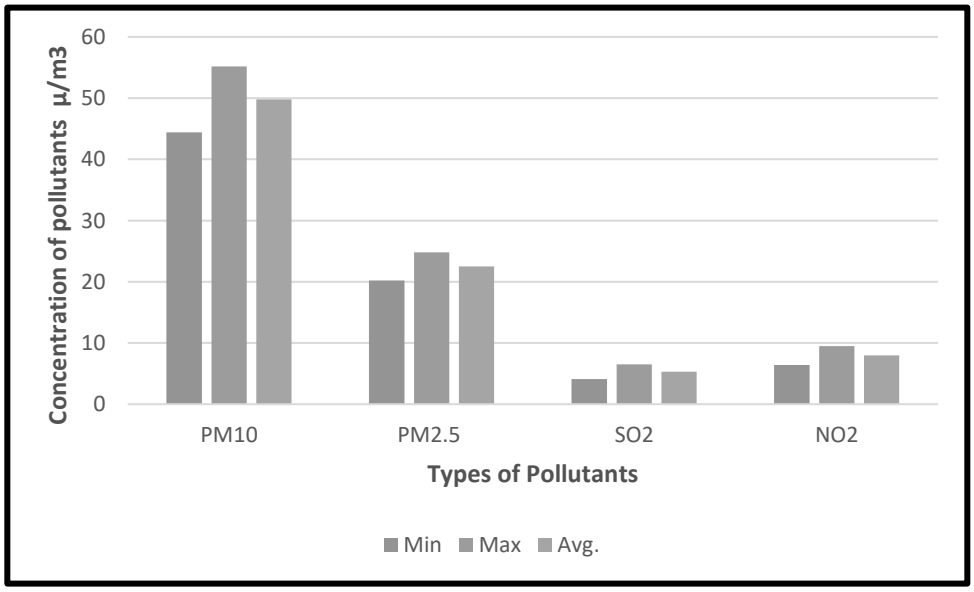


FIGURE - 3.11 AMBIENT AIR QUALITY DATA A6 - ANAICUT VILLAGE



From the above results, it is observed that the ambient air quality with respect to PM_{10}, $PM_{2.5}$, SO_2, and NO_2 at all the monitoring locations are well within the permissible limits specified by CPCB.

3.3.3 WATER ENVIRONMENT

Assessment of baseline data on water environment includes:

- Identification of water resources
- Collection of water samples
- Analyzing water samples collected for Physico-chemical parameters as per standards.

(a) Surface Water

From the proposed site, Periya Eri is located at a distance of 2.00 km in Northwest direction, Agaram Aru is located at a distance of 4.30 km in Northwest direction, Palar River is located at a distance of 7.44 km in Northern direction and Bahuda River is located at a distance of 7.50 km in Northern direction respectively. The rainfall over the area is moderate, the rainwater storage in open wells, trenches is in practice over the area and the stored water acts as source of freshwater. The prevailing status of surface water quality has been assessed during the study period. Surface water quality locations and results are provided in **Table - 3.5** and **Figure - 3.12**.

(b) Ground Water

The rainfall is the main source for the availability of water both in surface and sub-surface. The quantum of rainfall varies every year depending upon the monsoon. However, the extraction of surface and sub-surface water is increasing year by year. It leads to environmental impact on the water sources like depletion of water level, deterioration of water quality. It makes the demand for the quantification of available water and also its quality for various purposes like agriculture, industries, drinking and domestic purposes. Total six (06) ground water monitoring locations were identified for assessment in different villages around the project site based on the usage of sub surface water by the settlements/ villages in the study area. The groundwater results are compared with the acceptable and permissible water quality standards as per IS:10500 (2012) for drinking water. Groundwater quality monitoring locations and results are given in **Table - 3.5** and **Figure - 3.12a**.

(c) Sampling Locations and Results

Three (3) surface water samples and Six (6) ground water samples were collected from the study area and were analyzed for physio-chemical, heavy metals and bacteriological parameters in order to assess the effect of mining and other activities on water bodies. The samples were analyzed as per the procedures specified by CPCB, IS. The water sampling locations are given in **Table - 3.5** and shown as **Figure - 3.12 & 3.12a**. The monitoring locations were selected based on:

- Location of the major water bodies
- Location of project site,
- Likely areas that can represent baseline conditions
- Water bodies nearby

Table - 3.5 Water Sampling Locations

S.NO	Location Code	Monitoring Locations	Latitude and longitude
Surface Water			
1	SW1	Agaram aru River (Upstream)	12°55'10.81"N & 78°56'47.7"E
2	SW2	Agaram aru River (Downstream)	12°53'23.33"N & 78°52'4.9"E
3	SW3	Odiyathur Lake	12°51'39.32"N & 78°53'12.8"E
Ground Water			
1	GW1	Project site	12°50'40.55"N 78°56'09.12"E
2	GW2	Thangal	12°51'04.18"N & 78°56'17.48"E
3	GW3	Pichanatham	12°50'2.02"N & 78°56'36.06"E
4	GW4	Karadikudi	12°50'39.03"N & 78°55'31.26"E
5	GW5	Odiyathur	12°52'7.05"N & 78°55'39.56"E
6	GW6	Anaicut	12°52'36.81"N & 78°59'14.06"E

FIGURE - 3.12 BASE MAP OF SURFACE WATER SAMPLING LOCATIONS

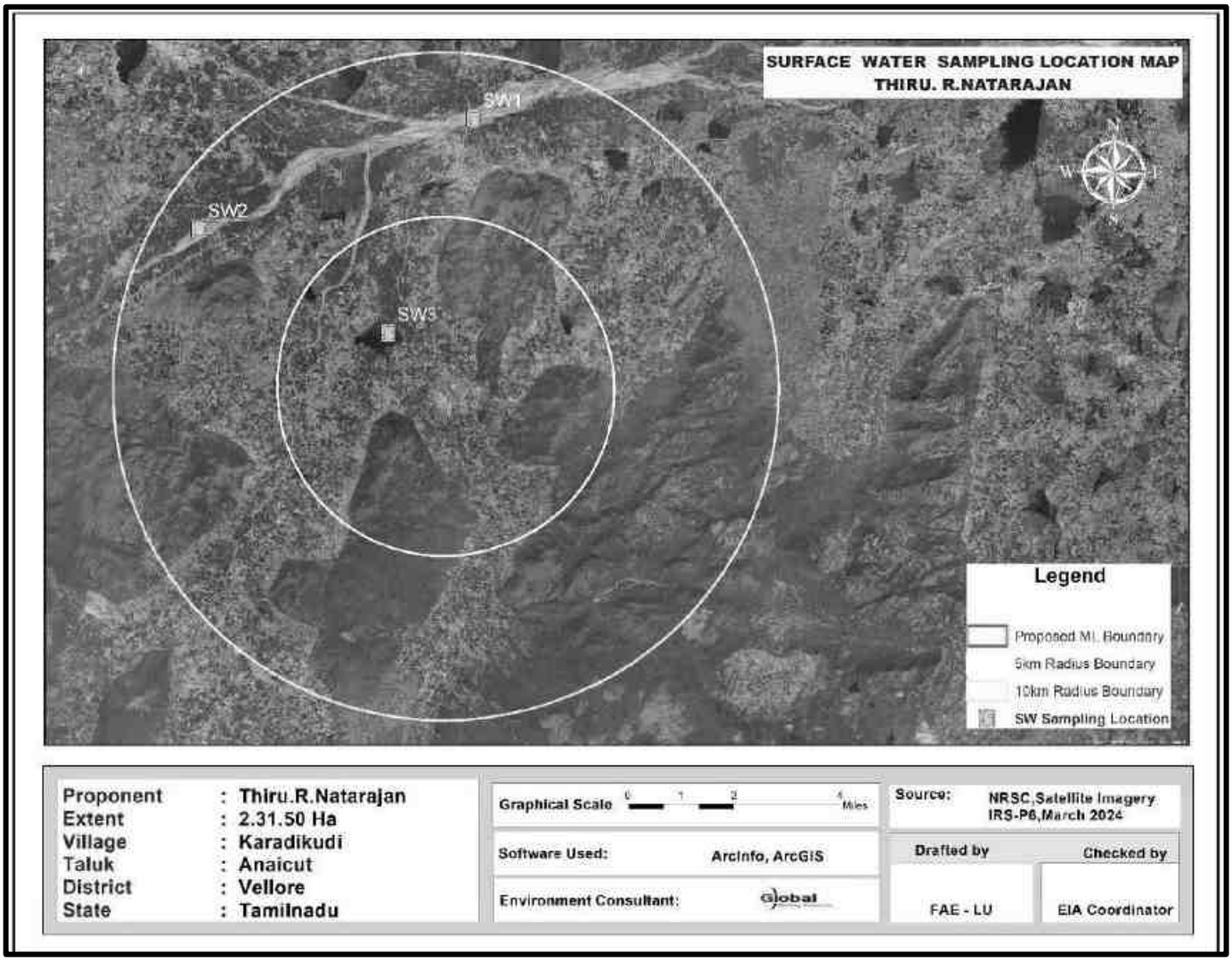
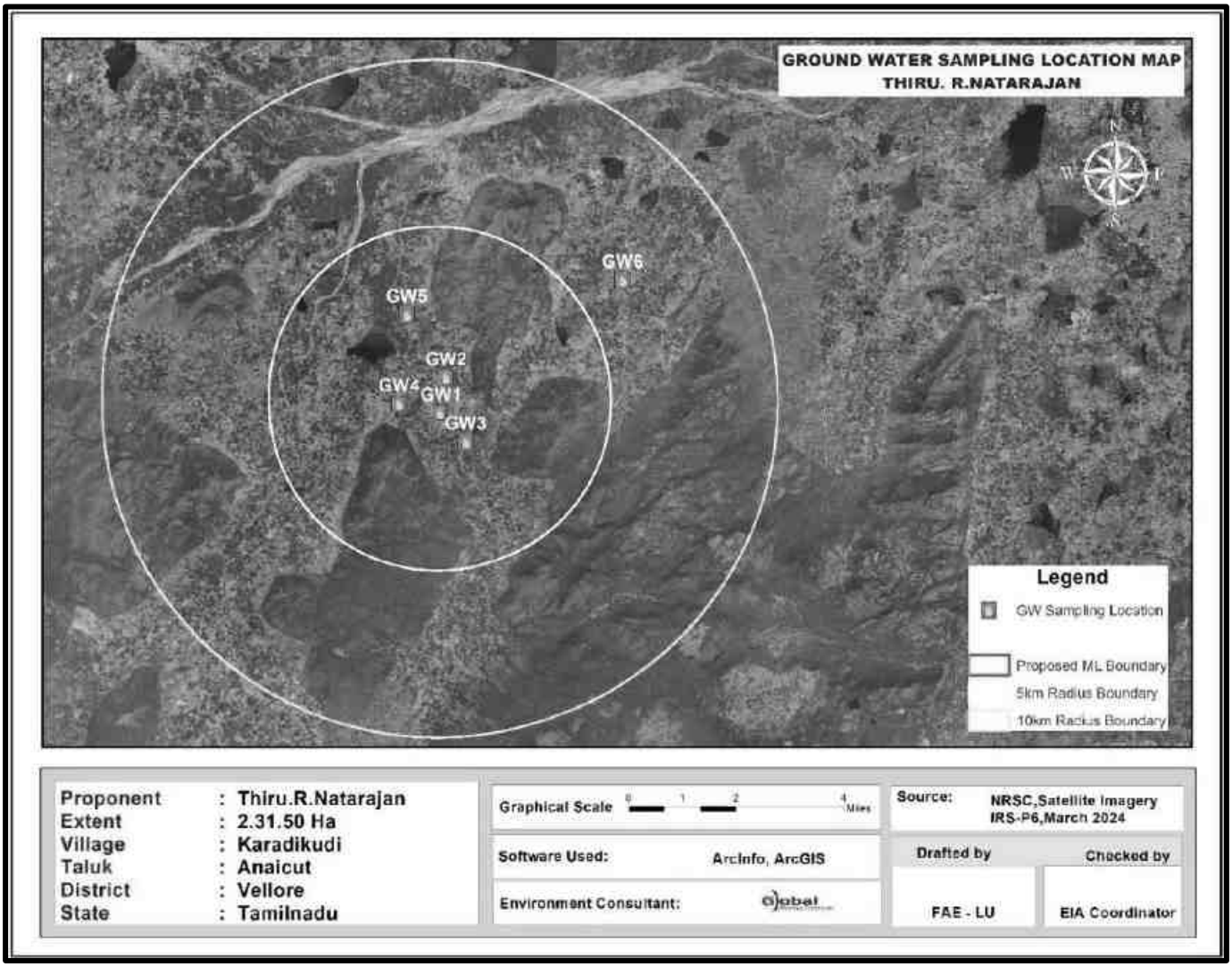


FIGURE - 3.12a BASE MAP OF GROUND WATER SAMPLING LOCATIONS



The samples were analyzed by M/s. Shrient Analytical & Research Labs Private Limited, Chennai and the results are summarized as table below.

Table - 3.6 Results of Surface Water Analysis

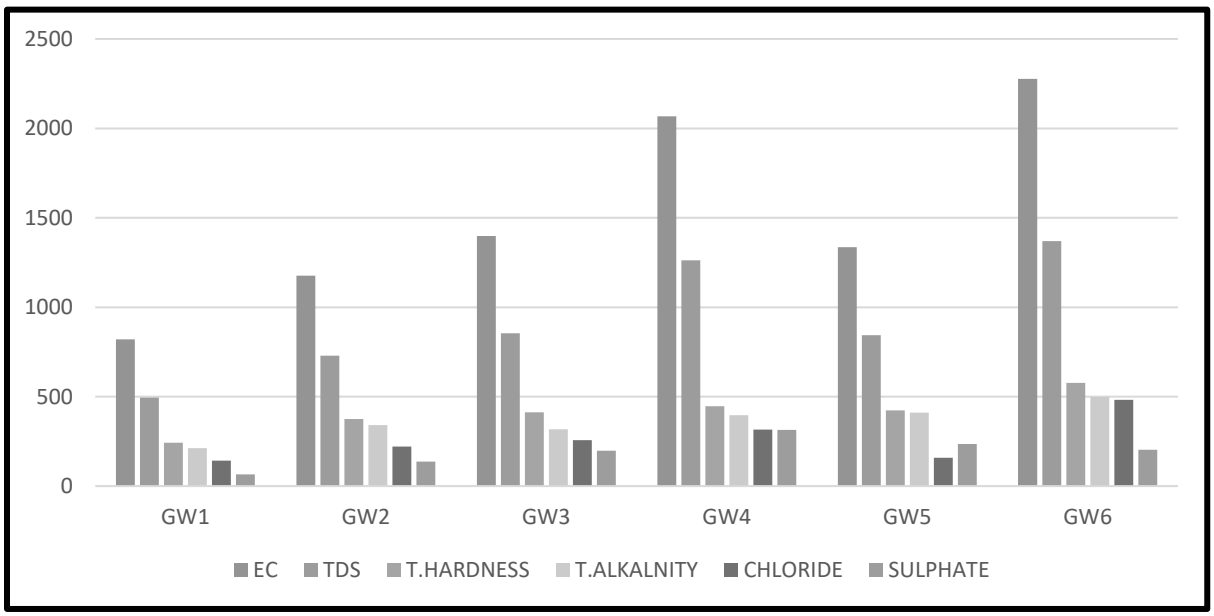
Sr.No	Parameter	Unit	SW1	SW2	SW3	Surface water standards (IS: 2296 –Class A)
1	pH	-	8.01	8.08	7.41	6.5-8.5
2	EC	µs/cm	1042	1251	511.2	-
3	Turbidity	NTU	<1.0	<1.0	110	1
4	Temperature	-	30.5	31	30.5	-
5	Odour	mg/l	Agreeable	Agreeable	Agreeable	500
6	Total Hardness	mg/l	312	320	190	-
7	Calcium Hardness	mg/l	171	175	130	
8	Magnesium Hardness	mg/l	141	145	59.5	-
9	Calcium	mg/l	68.4	69.9	52.1	300
10	Magnesium	mg/l	33.9	34.8	14.3	-
11	Total Alkalnity	mg/l	372	396	141	-
12	Chloride	mg/l	163	192	51.2	-
13	Sulphate	mg/l	54.7	109	65.8	400
14	Mangenese	mg/l	BDL(DL-0.05)	BDL(DL-0.05)	BDL(DL-0.05)	0.5
15	Iron	mg/l	0.03	0.06	0.08	1.0
16	Nitrate	mg/l	2.35	1.25	2.68	20
17	Fluoride	mg/l	0.662162162	0.706306306	0.4875	1.5
18	TDS	mg/l	630	755	326	500
19	FRC	mg/l	BDL(DL-0.2)	BDL(DL-0.2)	BDL(DL-0.2)	250
20	TSS	mg/l	14.0	24.0	56.0	-
21	COD	mg/l	BDL(DL-4.0)	BDL(DL-4.0)	BDL(DL-4.0)	-
22	BOD	mg/l	BDL(DL-2.0)	BDL(DL-2.0)	BDL(DL-2.0)	-
23	DO	mg/l	6.5	6.2	5.9	-

Table - 3.7 Results of Ground Water sampling Analysis

S. No	Parameter	GW1	GW2	GW3	GW4	GW5	GW6	Specification/Limit (As per IS:10500 2012)	
								Desirable	Permissible
1	pH	7.61	6.78	7.38	7.74	7.61	7.32	6.5 - 8.5	No Relaxation
2	EC	820.2	1176	1398	2068	1336	2276	1	5
3	Turbidity	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	Agreeable	Agreeable
4	Odour	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable
5	Total hardness	242	376	413	446	424	577	1	15
6	Calcium hardness	156	298	316	260	242	376	-	-
7	Magnesium hardness	85.6	78.1	96.7	186	182	201	-	-
8	Calcium	62.5	119	126	104	96.7	150	200	600
9	Magnesium	20.5	18.7	23.2	44.6	43.7	48.2	75	200
10	Total Alkalnity	212	341	318	396	412	498		
11	Chloride	143	222	256	315	158	483		
12	Sulphate	64.8	137	199	315	235	203	250	1000
13	Mangenese	BDL (DL-0.05)	BDL (DL-0.05)	BDL (DL-0.05)	BDL (DL-0.05)	BDL (DL-0.05)	BDL (DL-0.05)	30	100
14	Iron	0.06	0.06	0.12	0.03	0.00	0.04	45	No Relaxation
15	Nitrate	3.24	2.98	3.44	2.61	1.87	2.65	200	400
16	Fluoride	0.55	0.19	0.57	0.56	0.62	0.69	1	No Relaxation
17	TDS	495	730	854	1262	844	1370	0.1	0.3
18	FRC	BDL(DL-0.2)	BDL(DL-0.2)	BDL(DL-0.2)	BDL(DL-0.2)	BDL(DL-0.2)	BDL(DL-0.2)	Not Specified	Not Specified

Some of the common parameters including EC, TDS, Total Hardness, Total Alkalinity, Chlorides and Sulphates in the 6 locations were plotted and the graph is provided below.

FIGURE - 3.13 VALUES OF FEW COMMON PARAMETERS IN GROUND WATER ANALYSIS

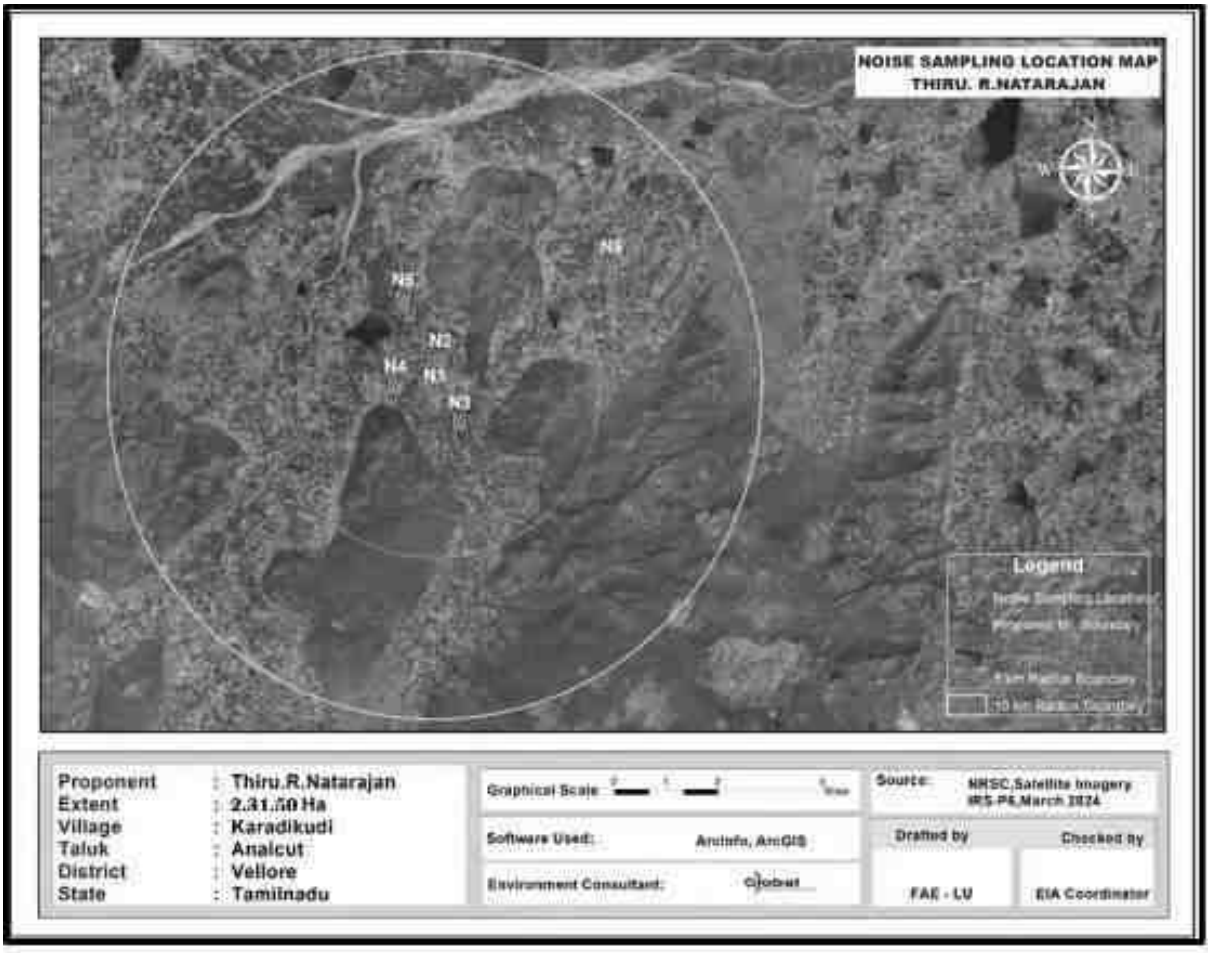


All the values were found to be within the permissible limits.

3.3.4 NOISE MONITORING

Noise level monitoring was calculated using a noise level meter by NABL Accredited lab and the results are summarized below. The noise monitoring locations are given in **Figure - 3.14**.

FIGURE - 3.14 BASE MAP OF NOISE MONITORING LOCATIONS



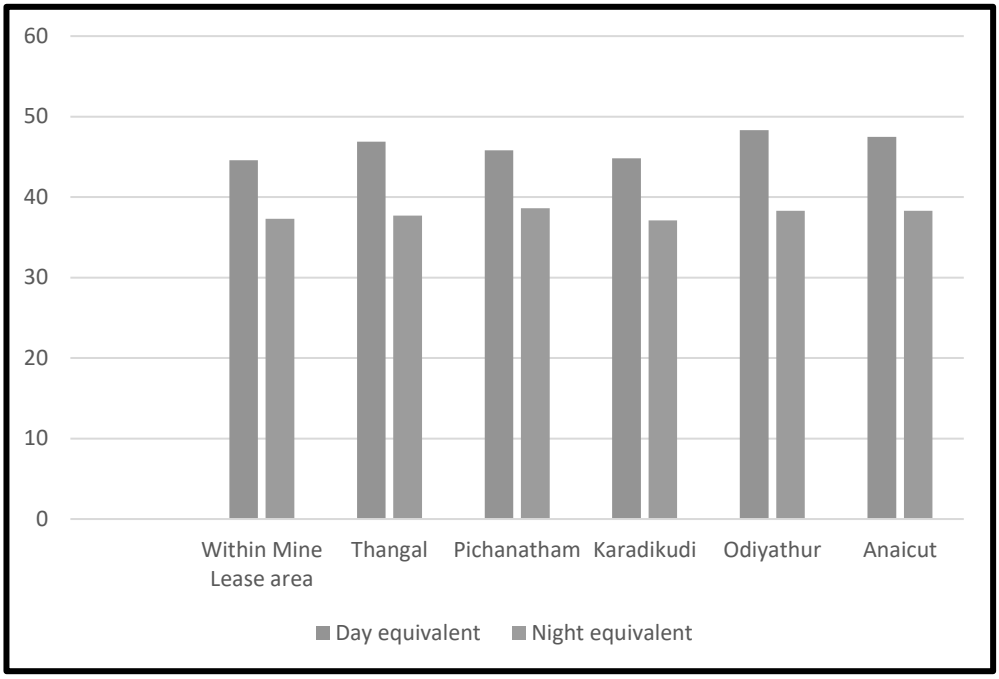
The results are given in Table below.

Table - 3.8 Noise monitoring Results

S. No	Location	Day equivalent (dB)	Night equivalent (dB)	Permissible noise level standards by CPCB		Zone
				Day time (dB)	Night time (dB)	
1	Within Mine Lease area	44.6	37.3	75	70	Industrial Zone
2	Thangal	46.9	37.7	55	45	Residential Zone
3	Pichanatham	45.8	38.6			
4	Karadikudi	44.8	37.1			
5	Odiyathur	48.3	38.3			
6	Anaicut	47.5	38.3			

The results are plotted as below.

FIGURE - 3.15 DAY AND NIGHT EQUIVALENT VALUES IN 6 LOCATIONS

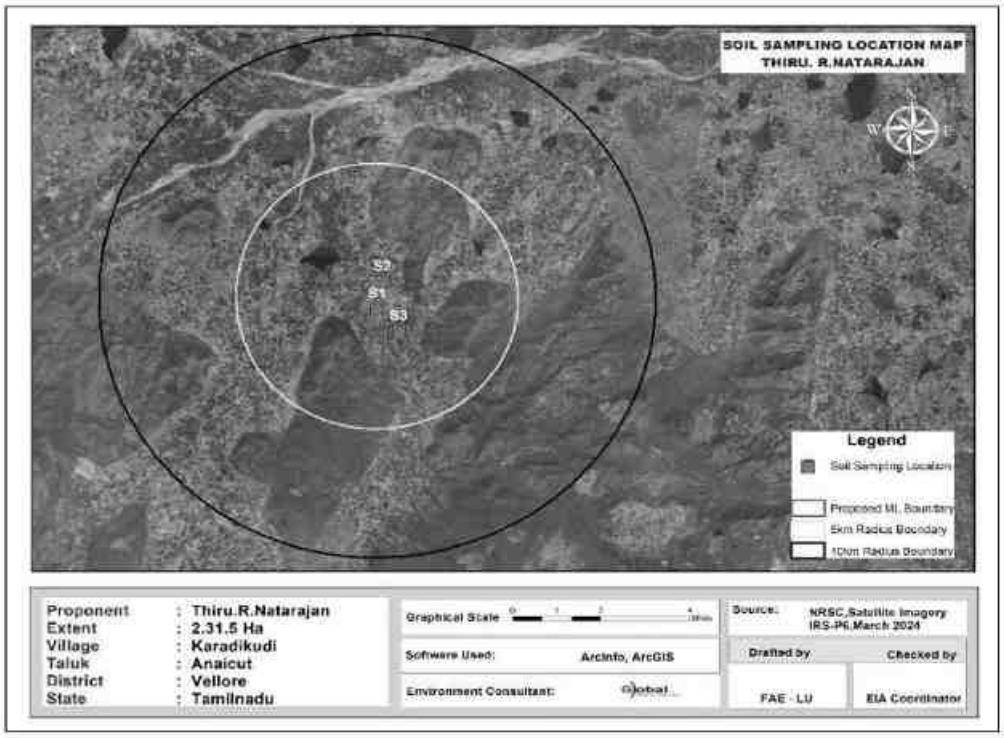


All the values are found to be within CPCB norms.

3.3.5 SOIL SAMPLING ANALYSIS

Soil samples have been collected from the mine lease area (S1) and 2 other locations from Thangal Village (S2), Pichanatham Village (S3). The locations are shown in figure below.

FIGURE - 3.16 BASE MAP OF SOIL SAMPLING LOCATIONS



The results are summarized in the table below.

Table - 3.9 Results of Soil Sample Analysis

S.No	Parameter	S1	S2	S3
1	pH	8.21	7.52	7.94
2	EC	87.21	64.83	109.20
3	Dry matter	90.86	95.11	91.62
4	Water content	9.14	4.89	8.38
5	Organic matter	0.12	0.15	0.21
6	Soil texture	Silty Clay Loam	Silty Clay	Clay
7	Total soluble Sulphates %	BDL(DL-0.02)	BDL(DL-0.02)	BDL(DL-0.02)
8	Grain Size Distribution			
	Sand %	8.60	5.41	5.16
	Silt %	54.20	49.39	37.06
	Clay %	37.20	45.21	57.78
9	Nitrogen & nitrogenous compounds mg/kg	154	192	177
10	Phosphorus mg/kg	0.14	0.14	0.14
11	Sodium mg/kg	1015	825	793
12	Potassium mg/kg	515	339	384
13	Water holding capacity	4.2	3.9	4.7
14	Porosity	19.5	18.4	17.2

3.3.6 BIOLOGICAL ENVIRONMENT

The biological study of the area has been conducted in order to understand the ecological status of the existing flora and fauna to generate baseline information and evaluate the probable impacts on the biological environment. The details are given below.

(a) Flora in the study area

We have contacted field survey during study period. The flora population in each quadrant is summed up for the total population in the study area. Also, data from the State Forest department is used.

Core Zone

During the field visit, it is observed that there are no national parks / Sanctuaries / forests in the 10km buffer area. The study area is devoid of any major plantations.

Table - 3.10 Flora in Core Zone

S.No.	Scientific name	Vernacular/English name	Type of flora
1	*Calotropis gigantea*	Erukku	Shrubs
2	*Cassia auriculata*	Aavarai	
3	*Achyranthes aspera*	Nayuruvi	

Buffer zone

Only common trees, shrubs, bushes, etc. are found in the buffer zone. The list is given below.

Table - 3.11 Flora in Buffer zone

S.No.	Scientific name	Vernacular/English name	Type of flora
1	*Azadirachta indica*	Neem	Trees
2	*Carica papaya*	Papaya	
3	*Mangifera indica*	Mango	
4	*Acacia leucophloea*	Velamaram	
5	*Acacia nilotica*	Karu- velamaram	
6	*Moringa oleifera*	Murungai	
7	*Tamarindus indica*	Puli	
8	*Tectona grandis*	Theku	
9	*Manilkara zapota*	Sappota	
10	*Musa paradisiaca*	Vaazhalai	
11	*Borassus flabelliformis*	Panna-maram	
12	*Ficus benghalensis*	Alamaram	
13	*Ficus religiosa*	Arasamaram	
14	*Phyllanthus emblica*	Nellikkai	

15	*Calotropis gigantea*	Erukku	Shrubs
16	*Cassia auriculata*	Aavarai	
17	*Ricinus communis*	Aamanakku	
18	*Tecoma stans*	Arali	
19	*Aloe vera*	Kathalai	
20	*Catharanthus roseus*	Niththiya kalyani	Herbs
21	*Acalypha indica*	Kuppaimeni	
22	*Coccinia grandis*	Kovai	Climbers
23	*Cissus quadrangularis*	Pirandai	
24	*Jasminum angustifolium*	Kayyu malligai	
25	*Ziziphus oenoplia*	Suraimullu	
26	*Cymbopogon*	Lemon grass	Grasses
27	*Cyperus rotundus*	Coco grass	
28	*Cynodon dactylon*	Arugampul	

(b) Fauna in the study area

There is no specific Fauna found within ML area. The buffer zone Fauna in the area is studied by direct observation method. Secondary data collected from Forest department and the same is used in this report. People in the nearby locality were also consulted. The commonly found fauna in the area are given below.

Table - 3.12 Fauna in buffer zone

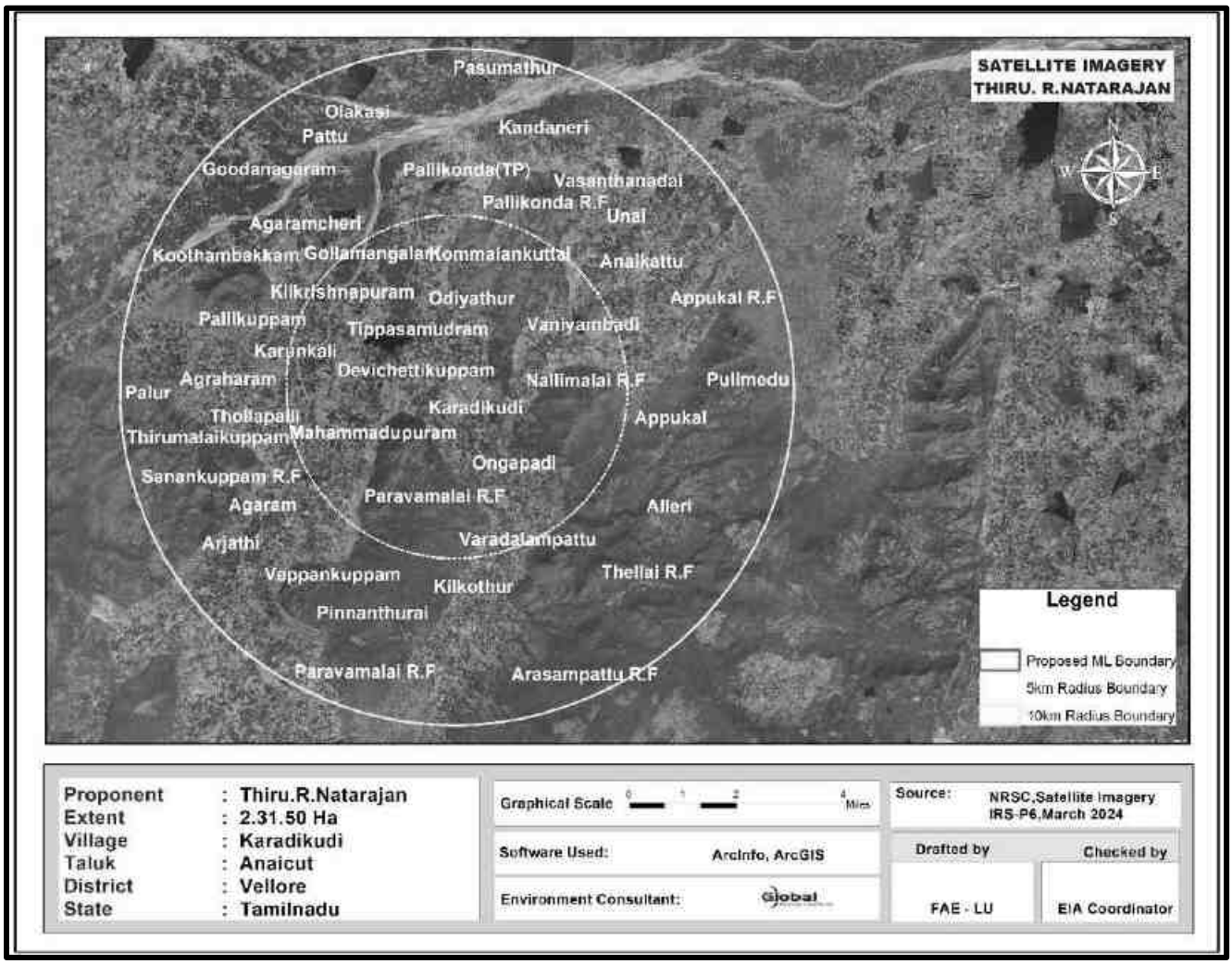
S. No.	Scientific name	Common name	Type of fauna	Schedule to which the species belong
1	*Canis familiaris*	Common dog	Mammals	IV
2	*Felis catus domesticus*	Domestic cat		IV
3	*Golunda ellioti*	Indian bush rat		IV
4	*Funambulus palmarum*	Squirrel		IV
5	*Lepus nigricollis*	Indian hare		IV
6	*Bos indicus*	Domestic cow		IV
7	*Corvus splendens*	Common Crow	Birds	V
8	*Passer domesticus*	House Sparrow		IV
9	*Acridotheres tristis*	Common Myna		IV
10	*Streptopelia chinensis*	Spotted dove		IV
11	*Calotes versicolar*	Lizard	Amphibia	IV
12	*Ptyas mucosa*	Indian rat Snake		IV
13	*Rana hexadactyla*	Frog		IV

3.3.7 LAND USE

(a) Remote Sensing Satellite Data used for the Study

For Land use and land cover study, Sensing Satellite data of Geo EYE has been used as per **Figure - 3.17**, a satellite map showing 10 Km radial distance. The geographical coordinates of the project are Latitude 12°50’40.55"N to 12°50’49.50"N and Longitude 78°56’07.22"E to 78°56’14.85"E.

FIGURE - 3.17 REMOTE SENSING SATELLITE IMAGE



Selection of Remote Sensing satellite Image (RSI) is on the availability of cloud free data and interpretability of predominant Land Use and Land Cover (LULC) category. The examination of satellite data showed that the region is always covered by clouds with lesser percentage during summer due to cluster habitation. But rained crops are

cultivated during southwest monsoon and hence a data acquired during first onset of precipitation is preferred so as to delineate crop and fallow land parcels of agricultural category. Delineation of scrub land is also possible since land with scrub could be easily distinguished from crop vegetation and separated. This may be an arduous task during monsoon since the entire area would be witnessed with sudden sprout of lush natural vegetation, mostly *Prosopis*, with first onset of precipitation.

(b) Methodology Adopted for the Land Use Study

Present study involves micro level analysis of land use pattern showing 10 km radius and changes in land use pattern using satellite data. This necessitates a careful analysis of satellite data adopting a well-defined methodology.

To cater the requirement, a preliminary assessment of terrain using digital analysis helping to infer relationship between terrain and land use has been carried out. Such an approach provides lucid understanding of land use units and enhances the knowledge on the land use pattern assisting in impact assessment.

The knowledge base thus generated is used to delineate various land use units while carrying out interpretation of the satellite image. The derived land use information is transformed into a GIS based spatial database using geo-referencing techniques. Besides, a limited but well focused field investigation also carried out and coordinates of significant land use units using hand held GPS (Global Positioning System) are gathered to be used as control points for geo-referencing. Interpreted land use units are verified in the field to carryout necessary corrections wherever is required before preparing final land use map.

Using the image elements such as color, tone, texture, size, shape and associated elements various land use units are delineated following the categorization and nomenclature adopted for the national level land use classification system as recommended by National Remote Sensing Centre (NRSC), Department of Space, Government of India. Some of the land use units that are identified in the study area are listed in **Table - 3.13** given below.

(c) Field Verification

Field verification involved collection, verification and record of the different surface features that create specific spectral signatures / image expressions on False Color

Composite (FCC) images. In the study area, doubtful areas identified in course of interpretation of imagery is systematically listed and transferred on to the corresponding Survey of India (SOI) topographical maps for ground verification. In addition to these, traverse routes were planned with reference to SOI topographical maps to verify interpreted LU/LC classes in such a manner that all the different classes are covered by at least 5 sampling areas, evenly distributed in the area. Ground truth details involving LU/LC classes and other ancillary information about crop growth stage, exposed soils, landform, nature and type of land degradation are recorded and the different land use classes are taken the Land use map.

Table - 3.13: Major Land use Units of the Study Area

Sr.No.	1st level classification	2nd level classification
1	Built-Up or Habitation	Residential
		Commercial / Industrial
2	Agriculture	Crop / Fallow Land
		Plantation
3	Water Bodies	Reservoir / Lake / Pond
		River
4	Vegetation Cover	Scrub
		Open Vegetation
		Close Vegetation
		Mangroves
5	Waste Land	Open Without Scrub
		Open With Scrub
6	Others	Mudflow
		Salt Pan
		Brick Manufacturing

(d) Land Use Pattern of 10 km Radial Buffer Area of Project Site

The existing land use pattern and land cover distribution of the whole acquired block, have been studied from the satellite imagery and subsequent ground checking during the field surveys.

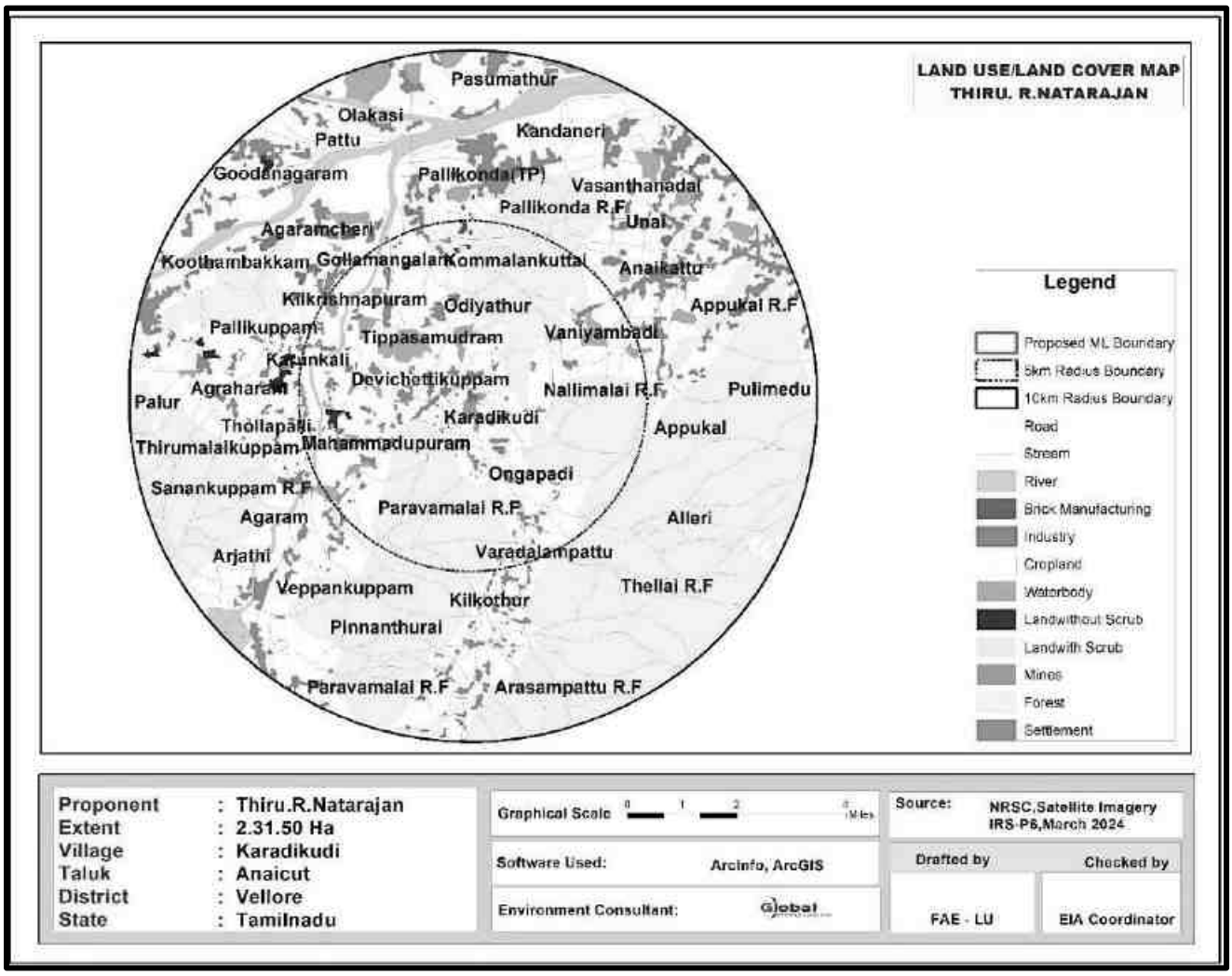
It mainly comprises of agricultural land with bi-annual crops of Kharif (Kharif: Jowar, Bajra, Cotton, etc. Season: July to October) and Rabi (Rabi: Wheat, Rai etc. Season: December to March). The presence of the agricultural land is followed by few dense settlements Karadikudi village natural or man-made pond etc. The shortage of rainfall, availability of ground water at deeper level and other climatic condition do not support good agricultural productivity in spite of having enough land. There is no

demarcated forest land within the study area, however, some scattered forest is found throughout the 10 km radius, especially along the periphery of the villages.

The general land use pattern of the core and buffer may be broadly classified into four major types – Buildup or habitation, Agriculture, Water Bodies, Waste land and other categories. Under Buildup or Habitation category villages, town and infrastructure are covered. Under Agriculture category crop land/fallow land and plantation are considered. Under the Water bodies category Reservoir/ lake, pond, River and stream are covered. Under Wasteland category land with scrub and land without scrub are interpreted. Lastly, other categories covers Mines area and Forest area for interpretation. These categories are delineated from the selected satellite image using image elements such as color, tone, texture, size, shape and associated elements. The delineated land use units are transformed into a spatial database in GIS environment and estimated for area thus representation of each category in the study area. The total area of LULC in the study area is calculated as 329 sq.km and spatial distribution of various LULC categories within buffer area are discussed below. The 5km and 10km radius land use map is shown in **Figure - 3.18**.

Land Use / Land Cover Classification classified into first level classification and second level classification and major land use/land cover classes were demarcated in the study area following Level II classification. A thematic map of 1:50,000 scale was generated incorporating these classified categories considering the area of the project. The details are given in **Table - 3.14** and Graphical representation are given below.

FIGURE - 3.18 LAND USE/LAND COVER MAP OF THE STUDY AREA



Built-up / Settlements

Settlements in the study area are generally small to medium size in stature and area scattered. Vellore is the relatively larger settlements observed at the north part of the study area.

Interpretation of settlement from the satellite image is based upon the image elements such as color, tone, texture and association. It is delineated by their typical red color. Association with linear features such as roads reaffirmed the presence of delineation of settlements. The spatial extent of Settlement is estimated as 20.14 sq.km representing 6.15% of the study area.

Agricultural Land

Under the broad category of Agriculture crop land, fallow land and plantation is

delineated. Cultivation is mostly dependent upon river water for irrigational activities. River, Ponds and tanks in each village act as rainwater storage units and do support domestic requirement and even cultivation to some extent. Because of these conditions, minimal water requiring crops such as corn, sunflower, oil seeds, grams, millets and coriander are cultivated. Cultivation is the most predominant crop cultivated and even if it failed their stalks are used as fodder for cattle.

Crop and Fallow land are interpreted using their image elements such as light to green, smooth to medium tone, they are the second most predominant land use category delineated in the buffer area. As explained earlier, cultivation mostly depends upon river, canal and rainfall and majority of the land parcels are tilled and ready for cultivation with even a scanty Canal. Hence, cropland is the predominant category estimated at 151.03 Sq.km representing 46.12% of the buffer area.

Wasteland

The last category of the land use units in the study area is "Wasteland" which denotes land parcels that could not be utilized for cultivation even after conservation measures – such as land with scrub, land without scrub area.

Next to agricultural area, natural vegetation such as land with scrub forms the predominant LULC category of the buffer area. Land with scrub is sparse and delineated as patches scattered in all the parts of the buffer area. The spatial pattern of scrub recommends it closely associated with water courses. This category occupies land with scrub an area of 1.56 sq.km representing 0.48% of the total core and buffer area.

On the other hand, Land without scrub is interpreted using brown to white color, medium tone and medium texture and is generally restricted around land covered with scrub and fallow land. They occur as small patches and very minimal area covering 1.23 sq.km representing 0.38% of the buffer area.

Water bodies

Many water bodies such as small and big Streams are seen distributed all over the study area. They support the domestic water requirements for cattle. At some places, they may also use for irrigation purpose and are very limited. Few dry stream courses are also seen in the study area. In the satellite image, water bodies are interpreted

by their light blue to greyish blue color, smooth tone and smooth texture.

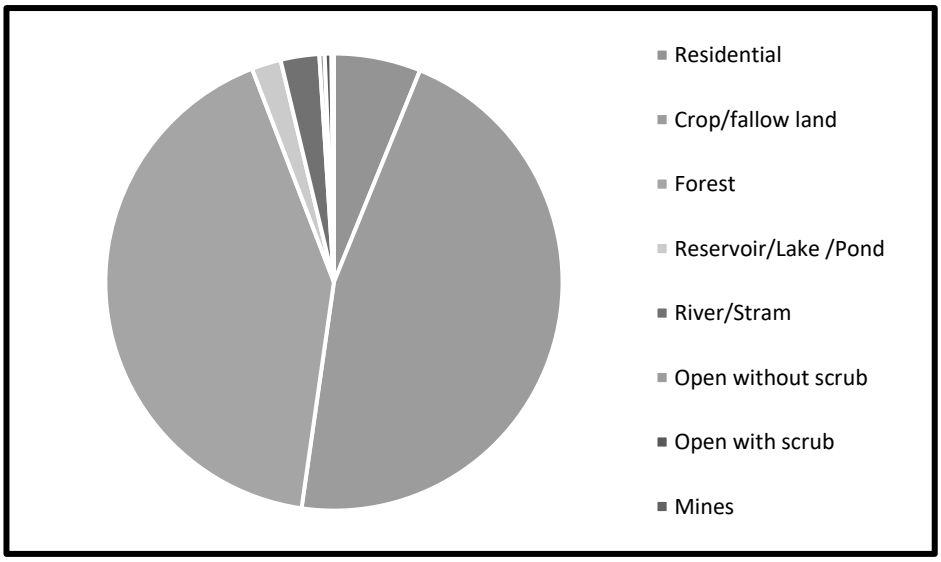
Most of the water bodies retain water for a shorter period after precipitation due to the soil constraint and hence go dry soon. Spatial extent of rivers, stream and other water bodies are estimated at 15.75 sq.km with 4.81% of the buffer area.

Mining and forest area

Mining and forest area are seen distributed all over the study area. Majority of domestic income are from mining business. Spatial extent of Mining and Forest area are estimated at 0.56 & 137.23 sq.km with 0.17 & 41.90% respectively.

Table - 3.14 Major Land Use Units of the Study Area in Percentage

S. No	1st Level Classification	Area in (sq.km)	Percentage (%)	2nd Level Classification	Area in (sq.km)	Percentage (%)
1	Built-up or habitation	20.14	6.15	Residential	20.14	6.15
				Commercial/Industrial		
2	Agriculture	151.03	46.12	Crop/fallow land	151.03	46.12
				Plantation		
3	Forest	137.23	41.90	Forest	137.23	41.90
4	Water bodies	15.75	4.81	Reservoir/Lake /Pond	6.8	2.08
				River/Stream	8.95	2.73
5	Waste Land	2.79	0.85	Open without scrub	1.23	0.38
				Open with scrub	1.56	0.48
6	Mines	0.56	0.17	Mines	0.56	0.17
Total		**327.5**	**100**		**327.5**	**100**



3.3.8 SOCIOECONOMIC ENVIRONMENT

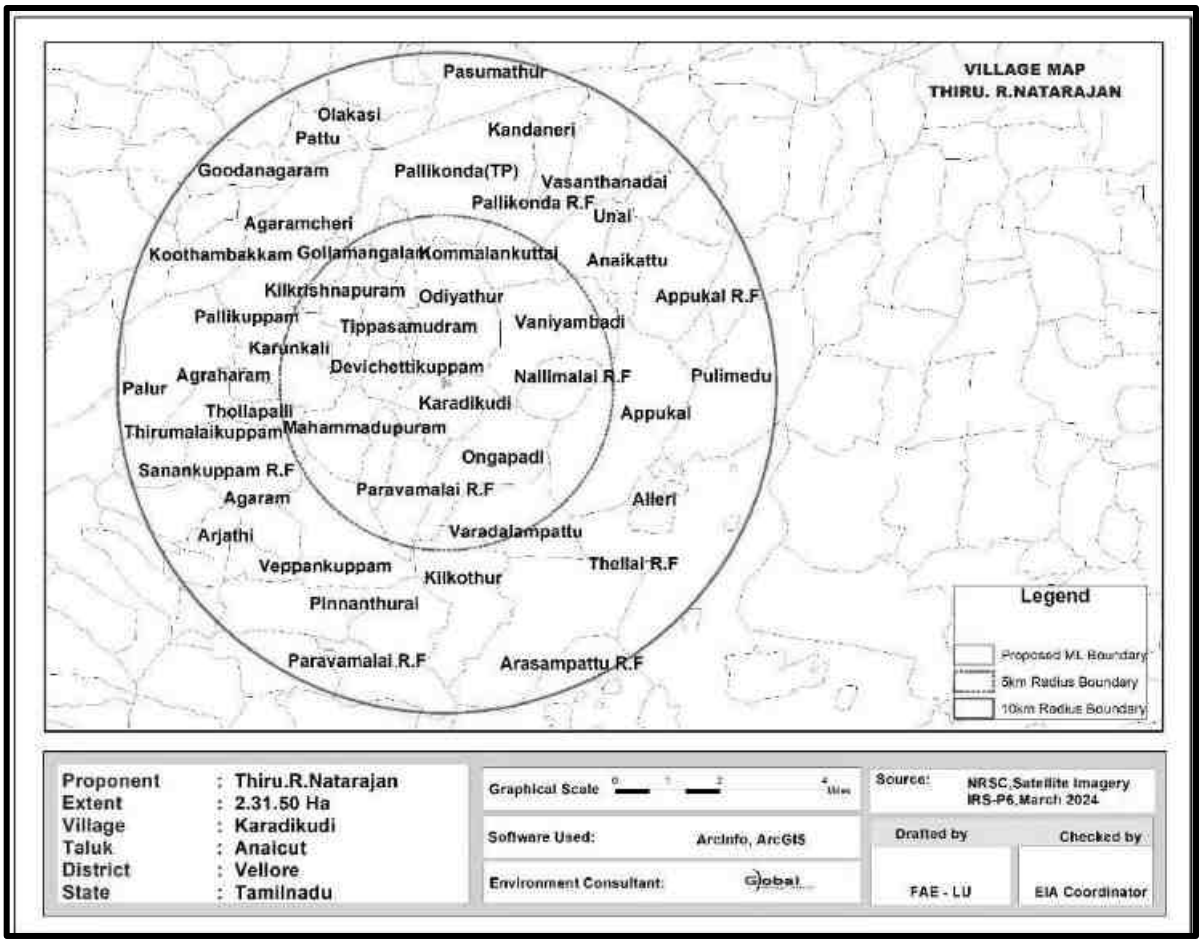
The socio-economic environment of the study area is studied by conducting primary sites through site visits and conducting sample surveys. The secondary data obtained from Census 2011 is also used. The following data area collected from secondary data:

- Demographic pattern.
- Health pattern
- Occupational structure.

(a) Details of Villages

The profile of the villages located in the study area is given in **Figure 3.19** below.

FIGURE - 3.19 VILLAGE MAP OF THE STUDY AREA



The project is located in Karadikudi Village, Anaicut Taluk, Vellore District, Tamil Nadu. The total population is 168185 which comprise of 83322 males and 84863 females. There are 50 rural/urban area in the study area. List of villages are given below.

Table - 3.15 Village details in study area

S.No.	Village/Town Name	Radius	Taluk Name	District Name
1	Karunkali	1-5km	Anaicut	Vellore
2	Mahammadupuram			
3	Paravamalai R F			
4	Pallikonda Tp			
5	Odiyathur			
6	Brahmanamangalam			
7	Kilkrishnapuram			
8	Kommalankuttai			
9	Tippasamudram			
10	Devichettikuppam			
11	Karadikudi			
12	Kilkothur			
13	Varadalampattu			
14	Ongapadi			
15	Vaniyambadi			
16	Appukal			
17	Agraharam			
18	Thollapalli			
19	Agaram			
20	Unai	6-10km		
21	Kandaneri			
22	Pulimedu			
23	Elavambadi			
24	Seduvalai			
25	Genganallore			
26	Anaikattu			
27	Vasanthanadai			
28	Vallandaraman			
29	Erayangadu			
30	Okkanapuram			
31	Guruvarajapalayam			
32	Veppankuppam			
33	Ramanayanikuppam			
34	Kuppambattu			
35	Palapadi			
36	Arjathi			
37	Ulli		Gudiyatham	
38	Singalpadi			
39	Ananganallore			
40	Kothakuppam			
41	Pattu			
42	Veppur			
43	Koothambakkam			
44	Agaramcheri			
45	Gollamangalam			
46	Pallikuppam			
47	Pasumathur		K V Kuppam	
48	Netteri			
49	Palur		Ambur	Tirupathur
50	Madanur			

(b) Population Profile of the study area

The below table shows that the male and female population ratios are almost equal. Among the total population 1.57% belong to Scheduled Tribes, 28.70% are Scheduled Caste and the balance 69.73% people belong to other castes. Among the total population 69.42% of the people are literate. Among the total population, 11.70% are literate males and 18.88% are literate females. This shows that the male literates are higher than the female literates.

Table - 3.16 Population profile of the study area

Particulars	No of Population	Percentage (%)
A. Population break-up by Gender		
Male Population	83322	49.54
Female Population	84863	50.46
Total	**168185**	**100**
B. Population break-up by Caste		
Scheduled Caste	48261	28.70
Scheduled Tribes	2648	1.57
Others	117276	69.73
Total	**168185**	**100**
C. Literacy Level		
Male Literate Population	63639	37.84
Female Literate Population	53107	31.58
Male Illiterate	19683	11.70
Female Illiterate	31756	18.88
Total	**168185**	**100**
D. Occupational structure		
Main workers	56643	-
Marginal workers	17037	-
Total Workers	73680	43.81
Total non-workers	94505	56.19
Total	**168185**	**100**

The results are plotted in figures below.

FIGURE - 3.20 GENDER-WISE POPULATION DISTRIBUTION

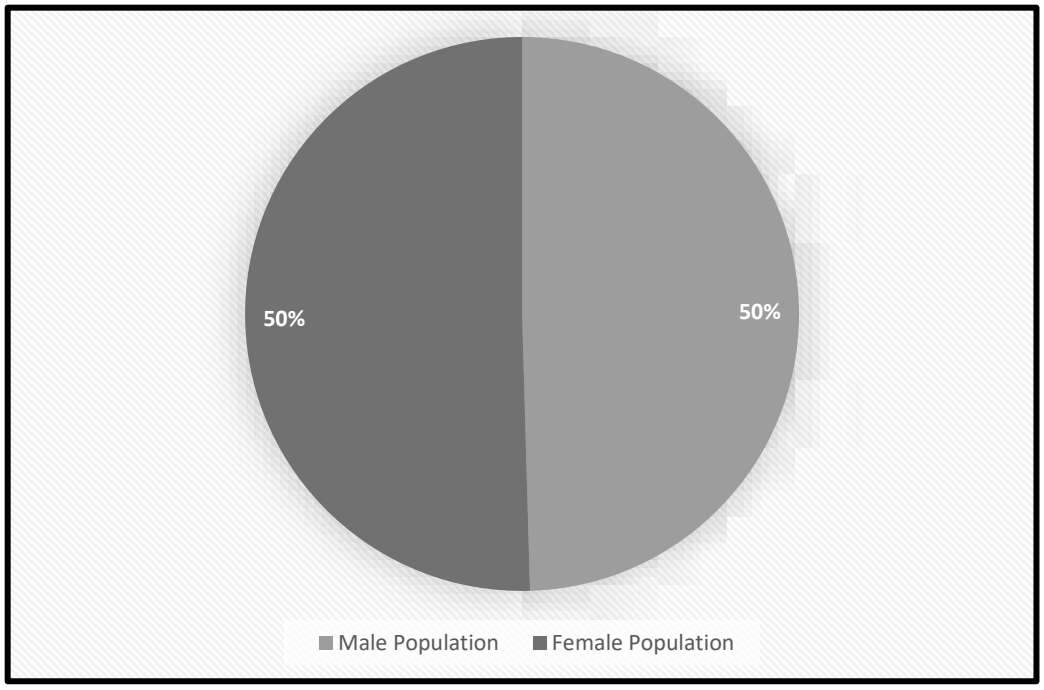


FIGURE - 3.21 GENDER WISE LITERACY DISTRIBUTION

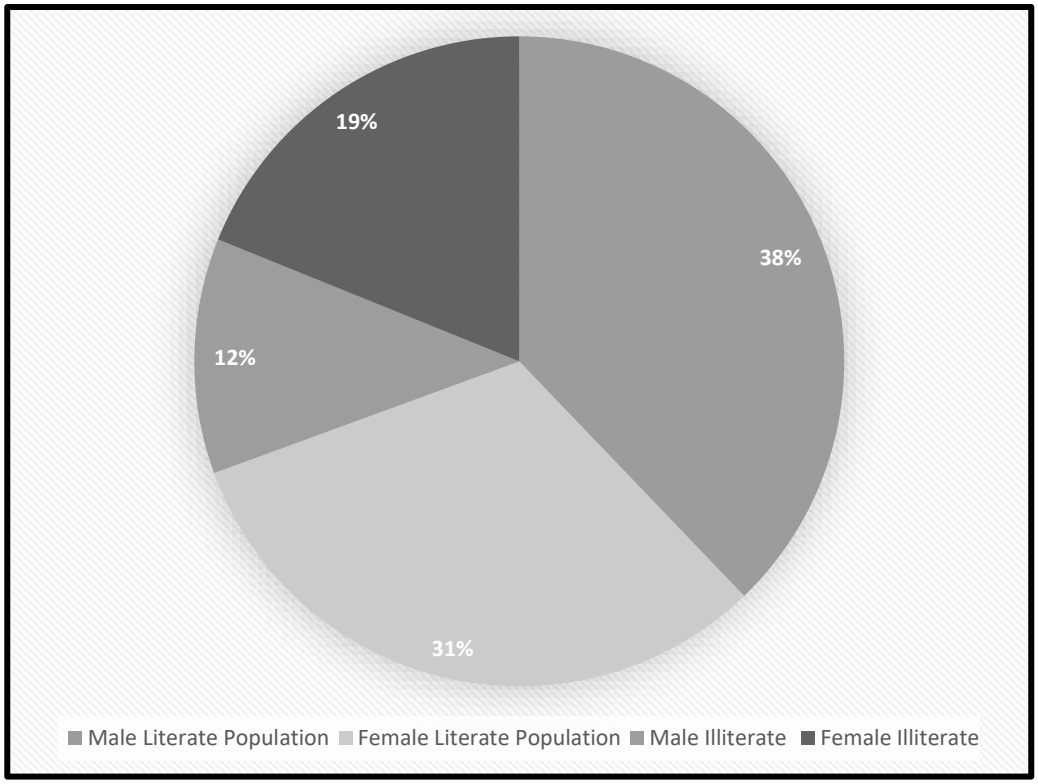
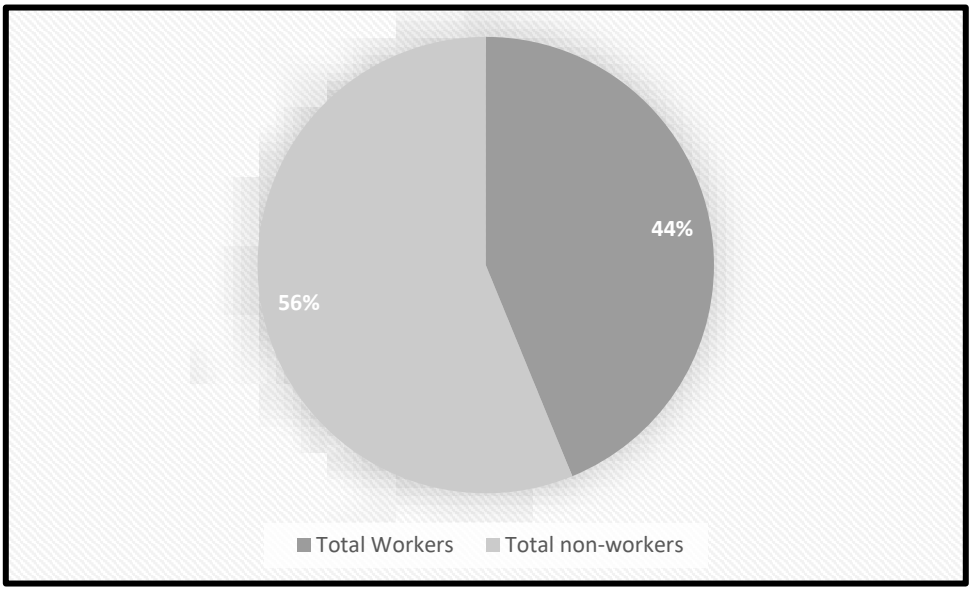


FIGURE - 3.22 OCCUPATIONAL STRUCTURE WITHIN BUFFER ZONE



(c) Infrastructure facilities in the study area

Education

In the study area, there are totally 20 Primary Schools functioning in this urban area. Among them 35 villages have 9 primary school, 10 villages have 5 primary schools & 5 villages have more than 6 primary school.

Table - 3.17 Educational infrastructure in the study area

S. No.	Particulars	Available in village (Nos)
1	Govt. Primary School	Anaicut - 20
2	Govt. Middle School	19
3	Govt. Secondary School	13
4	Govt. Senior Secondary School	11
5	Govt. Arts and Science Degree College	29
6	Govt. Engineering College	0
7	Govt. Medicine College	0
8	Govt. Management Institute	0
9	Govt. Polytechnic	0
10	Govt. Vocational Training School/ITI	0

Healthcare

In the study area, the following facilities are available.

Table - 3.18 Medical Infrastructure in the study area

S.No.	Particulars	Available in village (Nos)
1	Community Health Centre	5
2	Primary Health Centre	5
3	Primary Health Sub Centre	18
4	Maternity And Child Welfare Centre	16
5	TB Clinic	9
6	Hospital Allopathic	0

Other Infrastructure

The other infrastructure facilities available are given below.

Table - 3.19 Other Infrastructure in the study area

S.No.	Particulars	Available in village (Nos)
1	Tap Water-Treated	25
2	Covered Well	15
3	Hand Pump	16
4	Tube Wells/Borehole	13
5	Post office	7
6	Public bus services	20
7	Commercial Bank	8
8	Cooperative bank	13

(d) Sample Survey

The expert visited 5 villages in the study area namely Thangal, Pichanatham, Karadikudi, Odiyathur and Anaicut villages. Discussions were held with the people from nearby locality to study the social and economic conditions prevailing in the area. The expert also visited nearby hospitals, primary health centres and Balwadis/Anganwadis. The following observations were made.

Primary schools are available in many villages. For hospital facilities, people in the locality have to go to hospital in Anaicut which is about 6.73 Km -NE from the lease area. Major schools with higher secondary and senior secondary schools are located in Anaicut. The major Panchayat Union located in the area is in Vellore. Facilities like petrol pump stations, ATM facility are available in Anaicut.

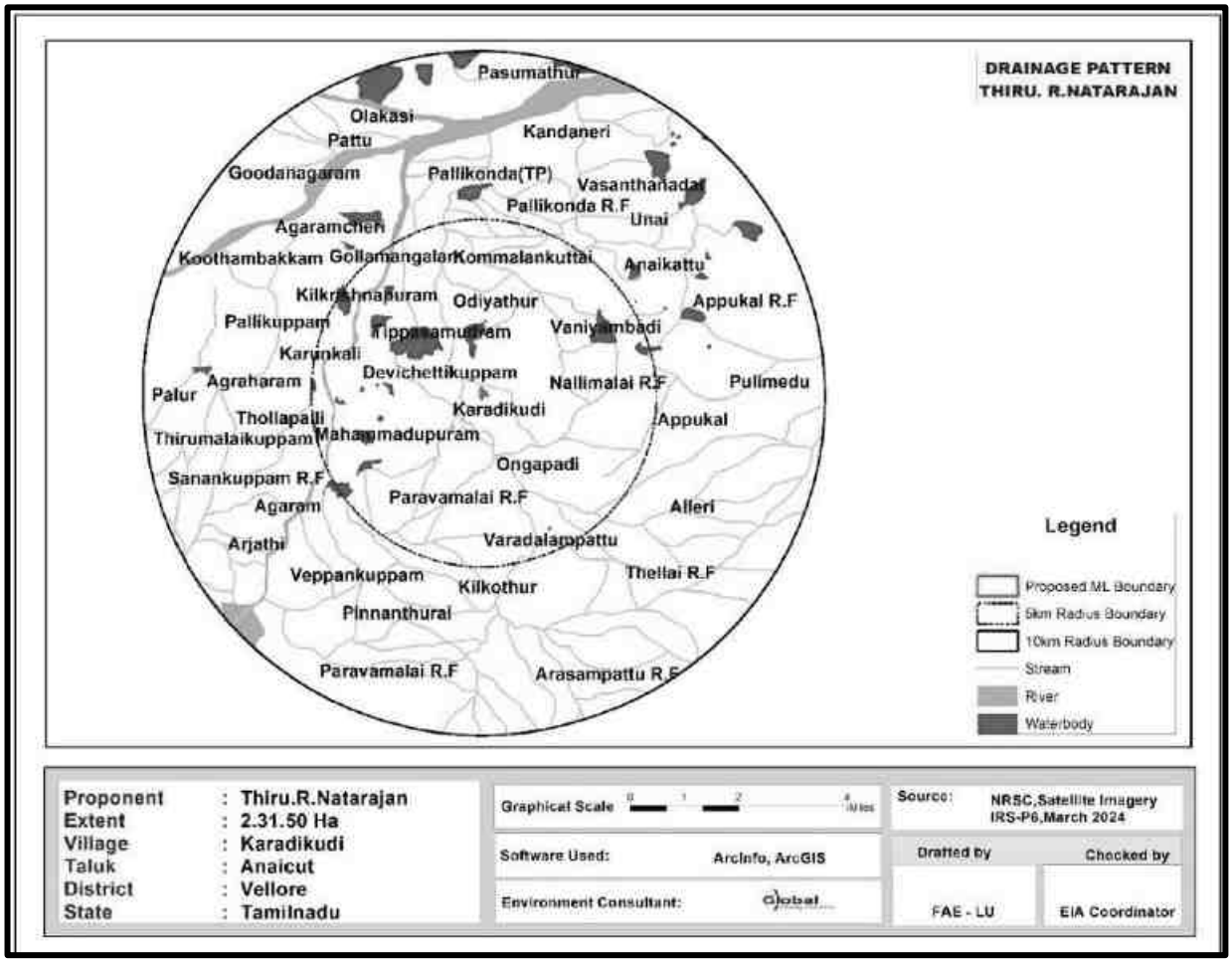
3.3.9 HYDROGEOLOGY OF THE STUDY AREA

The hydrological and hydrogeological pattern of the study area is studied in detail using satellite imagery. Within 10km radius from the proposed site, there is Periya Eri which is located at a distance of 2.00 km in Northwest direction, Agaram Aru is located at a distance of 4.30 km in Northwest direction, Palar River is located at a distance of 7.44 km in Northern direction and Bahuda River is located at a distance of 7.50 km in Northern direction respectively.

(a) HYDROGEOLOGICAL STUDY

Study is to assess the hydrogeological condition of the surrounding proposed mine lease area. The study area is located in Karadikudi Village, Anaicut Taluk, Vellore District, Tamilnadu State is considered to understand the nature of the general hydrogeological conditions of the surrounding proposed mine lease area.

FIGURE - 3.23 10 KILOMETER RADIUS OF THE DRAINAGE MAP



(b) PHYSIOGRAPHY AND DRAINAGE

Physiography: The area applied for quarry lease is exhibits hilly terrain covered by Gravel formation. The massive Charnockite formation is noticed below 2m (Avg) Gravel formation and sloping towards northern side of the area, the altitude of the area is above 310m (maximum) from MSL.

Drainage: The drainage pattern study were observed around 1 Km and 10 Km radius from the proposed mine lease area (Refer **Figure - 3.23**). The study reveals that, there is Periya Eri which is located at a distance of 2.00 km in Northwest direction, Agaram Aru is located at a distance of 4.30 km in Northwest direction, Palar River is located at a distance of 7.44 km in Northern direction and Bahuda River located at a distance of 7.50 km in Northern direction respectively.

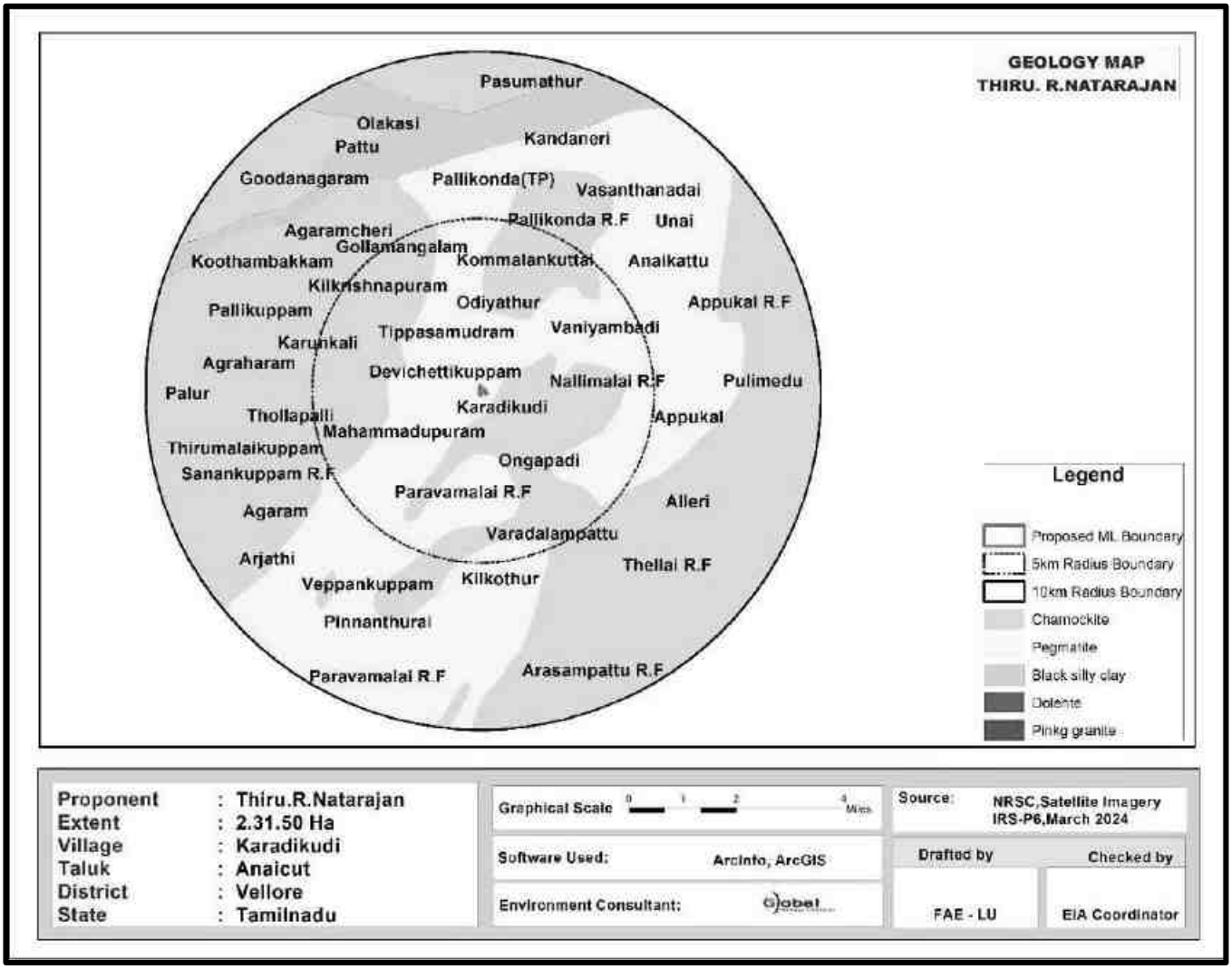
(c) GEOLOGY, GEOMORPHOLOGY AND SOIL

Geology: The Core and 10 Km buffer zone geological features (Refer **Figure - 3.24**) shows that Vellore District comprises rocks of Satyamangalam Group and Older Supracrustal Group of Archaean Age, Charnockite and Migmatite Groups of Southern Granulite Terrain of Archaean to Proterozic age, Peninsular Gneissic Complex-II(PGC-II) of Archean to Palaeoproterozoic, basic instrusives of Mesoproterozoic age, epidote hornblende gneiss of Proterozoic, Alkali Complex and acid instrusives of Neoproterozoic age and Quaternary viz., black silty clay of Palar-Swarnamukhi Formation of Late Holocene in age. The grey hornblende-biotite gneiss of PGC-II is occurring in the north-western parts of the district. Epidote hornblende gneiss occurs as north-south trending body near Odugattur and Agaram with Charnokite Group. Charnockite is most predominant rock type at south Palar river and forms the mail hill masses and plains. Apart from Charnockite, pyroxene granulite, pink migmatite, hornblende biotite gneiss and biotite gneiss are the main lithologies observed at south of Vellore and in an around Kaniyambadi. The major lithologies at north Palar river near Katpadi are migmatite gneiss, pink migmatite and pink hornblende biotite granite.

Charnockite Group of rocks with interbanded sequence of pyroxene granulite and banded magnate quartzite have undergone wide spread migmatization giving rise to epidote-hornblende gneiss that show extensive shearing at the east of Odugathur. Dolerite dykes occur profusely throughout the area of the district and trending NS, NE-SW and E-W with minor variations and extent over a few meters to 70m width.

The granites, pegmatite, quartz and aplite veins occurs as a last phase of magmatism and mainly intruded rocks of peninsular Gneissic Complex (PCG-II). The late Holocene active fluvial deposits is marked by black silty clay and part of Palar Swarnamukhi formation. Regional Geology map for the 10 Km radius from the proposed project site is given as **Figure - 3.24**.

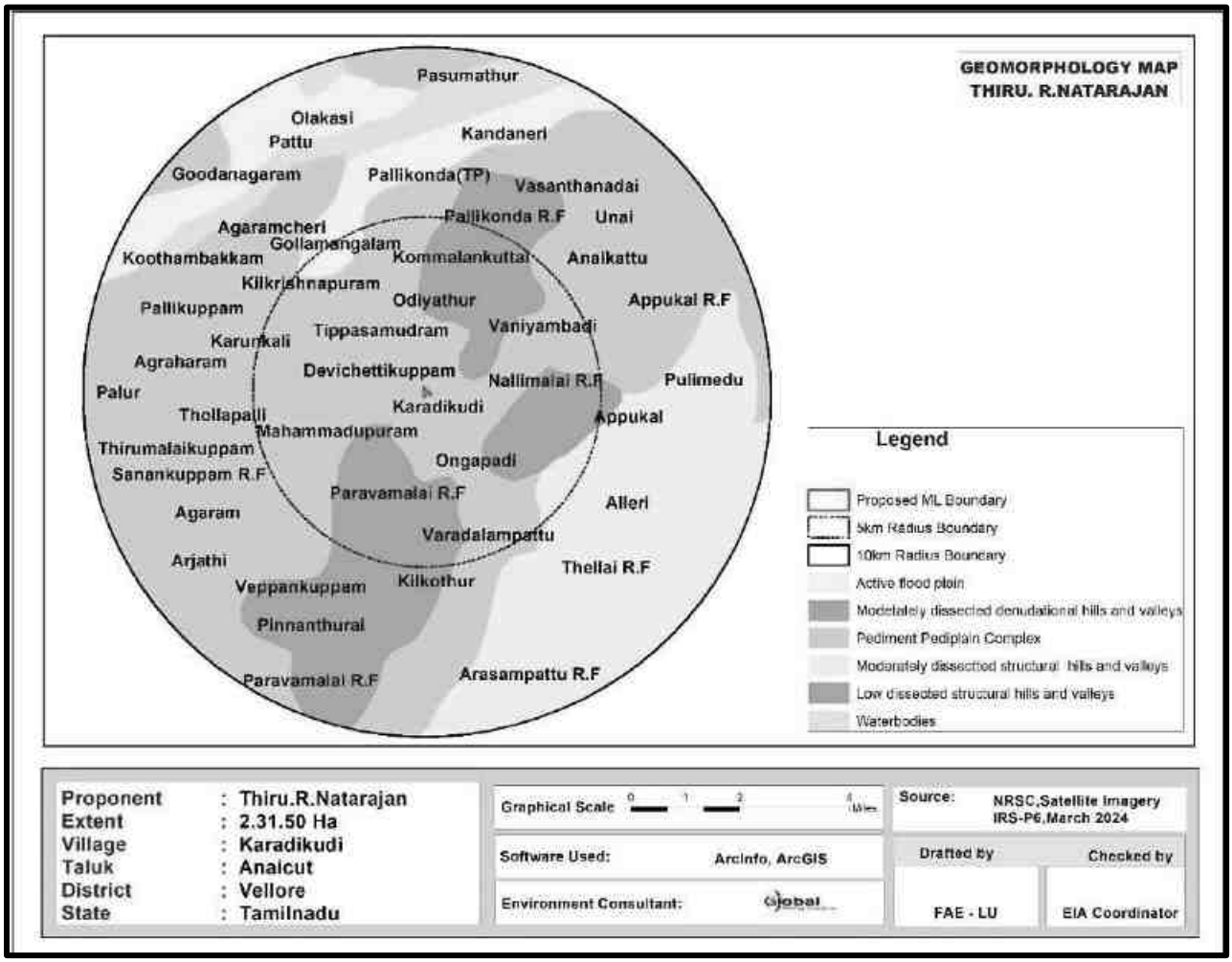
FIGURE - 3.24 10 KILOMETER RADIUS OF THE GEOLOGY MAP



Geomorphology: The Core and 10 Km buffered zone geomorphological features (Refer **Figure - 3.25**) shows that the district is pediment pediplain complex, western, southern and eastern part of the district are covered by moderately dissected denudational hills & valley near Rangampettai & east of Kaniyambadi. The area at south of Odugattur is falls under moderately dissected structural hills & valley. Active flood plains on the banks of Palar River. The isolated water bodies are through the

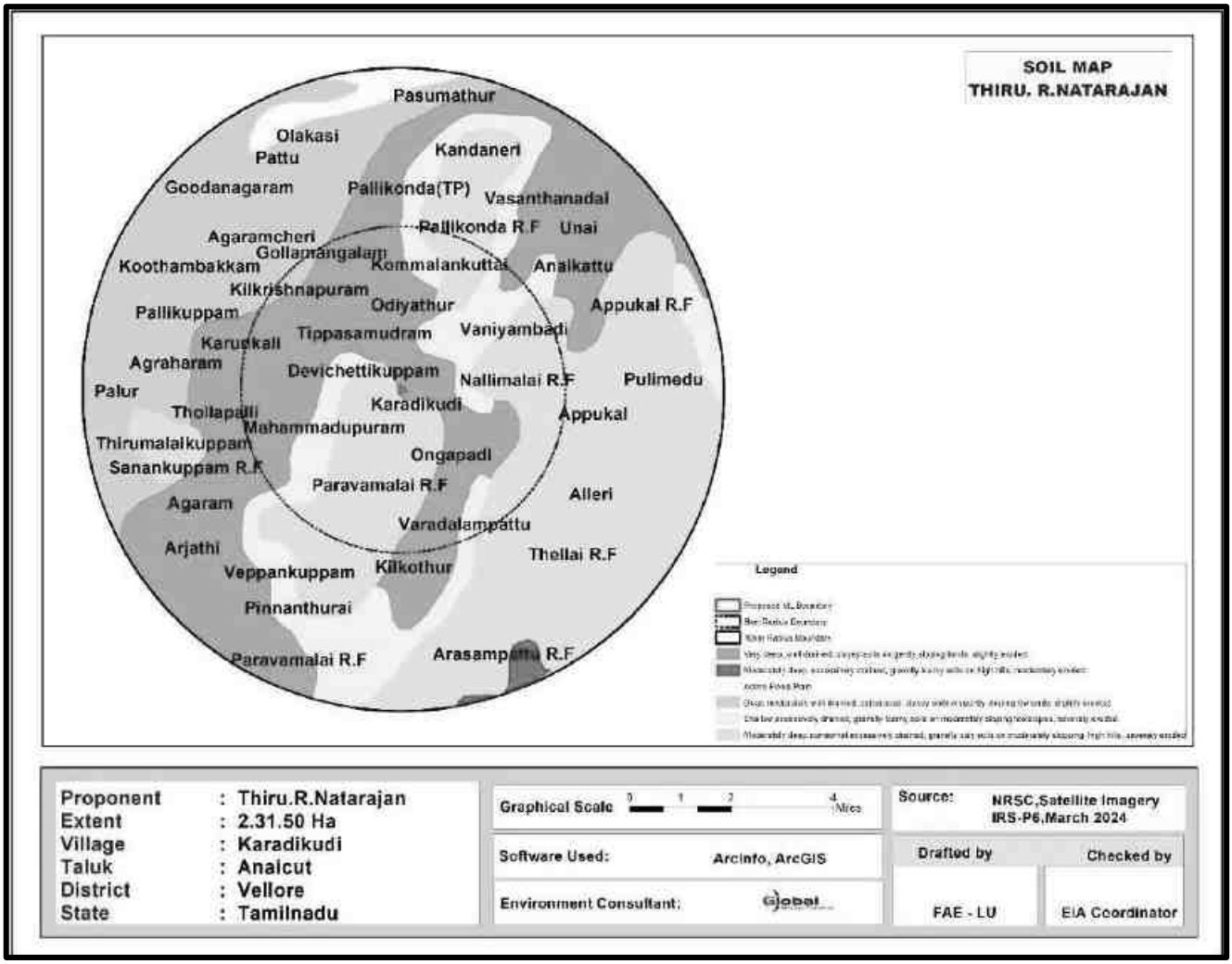
district. The most of the lineament are trending in NNE-SSW direction, while geomorphic lineaments are trending in E-W direction. The study area falls moderately denudational hills and valleys, Pediment pediplain complex, Moderately dissected structural hills and valleys, low dissected structural hill and valleys.

FIGURE - 3.25 10 KM RADIUS OF THE STUDY AREA GEOMORPHOLOGY MAP



Soil: The soil developed in and around Odugattur is moderately deep excessively drained, gravelly clay soil on hills, whereas, on NW part of the district near Rangampettai, shallow, well drained, gravely clay soil on gently sloping lands (Refer **Figure - 3.26**). The soil developed on both the banks of Palar River is deep drained, calcareous clayey soil on gently sloping low lands. The soil develops on isolated patch at SE of Odugattur is moderately deep, excessively drained, gravelly loam soil high hills.

FIGURE - 3.26 10 KM RADIUS OF THE STUDY AREA SOIL TYPE MAP



(d) BELOW GROUND LEVEL (BGL)

Figure - 3.27 & 3.28 shows the Non-Monsoon and Monsoon water level map of the study area.

FIGURE - 3.27 NON-MONSOON WATER LEVEL MAP OF THE STUDY AREA

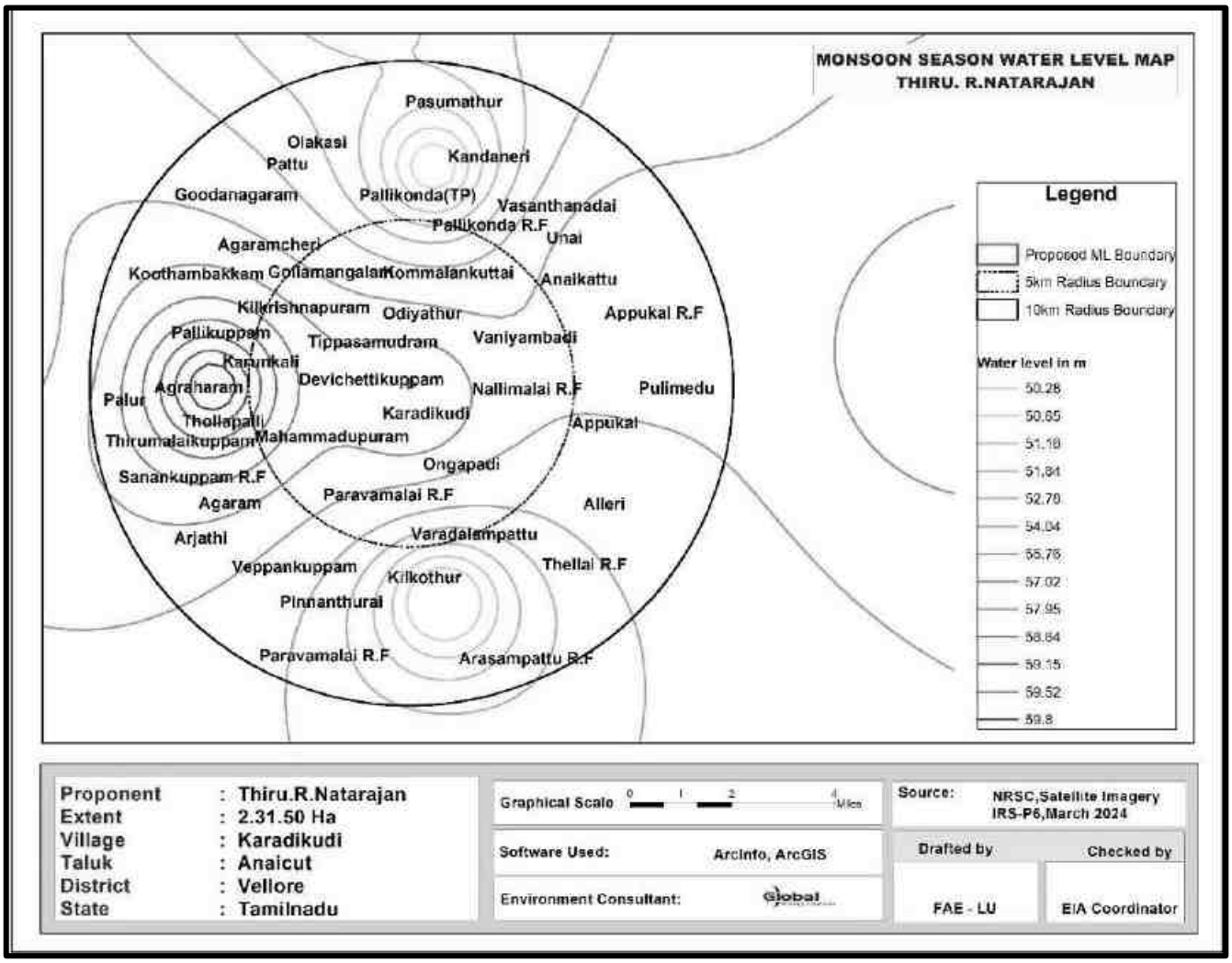
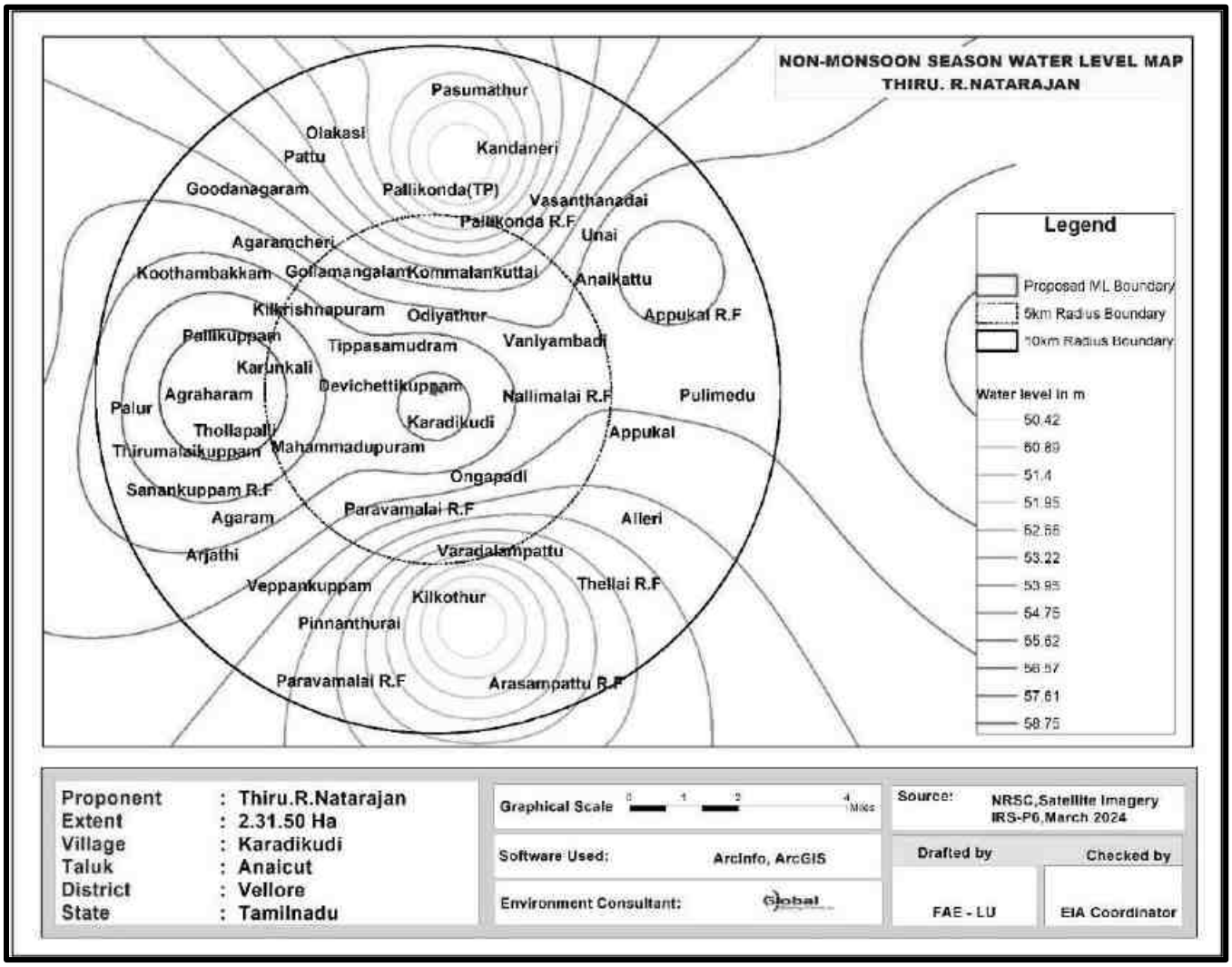


FIGURE - 3.28 MONSOON WATER LEVEL MAP OF THE STUDY AREA



(e) FIELD INVESTIGATION

The temporary seasonal stream water flow from center to outer most area. There is Periya Eri which is located at a distance of 2.00 km in Northwest direction, Agaram Aru is located at a distance of 4.30 km in Northwest direction, Palar River is located at a distance of 7.44 km in Northern direction and Bahuda River is located at a distance of 7.50 km in Northern direction from the proposed site. The water is temporarily found only during the rainy season.

In this representation in the two seasons, the water level substantially gets fall-down in the non-monsoon season, because of the rainfall impact and it extended up to the Monsoon season. Some of the wells water level is shallow depth in both seasons. These dug wells are located nearby water bodies. So, clearly shows that surface water is impact in these wells.

The shallow depth of groundwater level in the monsoon season. It is interesting to note that the water level is increased because of heavy rainfall during the southwest and northeast monsoon. The groundwater table level is substantially increased in the monsoon season. The ultimate depth of quarrying is proposed with maximum depth of 32m (17m Above Ground Level and 15m Below Ground level for the period of five years) and will not intersect the ground water table.

In the study area, the shallow aquifer is developed through dug wells and deeper aquifer through tube wells. The study has revealed that potential fractures are encountered at deeper levels. The water in the wells is available mainly monsoon and it reduces during non-monsoon demanding the groundwater. Bore wells are deep and it reflects that the yield is only better at deeper water levels.

Rain water collected in the tanks in the region acts as a good source of water during monsoon season. In order to increase the recharge, tanks, and percolation ponds may be provided with the recharge wells/recharge shafts penetrating this impervious layer to make it more effective in recharging the aquifer.

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CHAPTER - 4

ANTICIPATED ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

4.3 INTRODUCTION

This chapter deals with the various anticipated environmental impacts and mitigation measures of the proposed mining activity. The proposed method of mining is Opencast Mechanized and the quarry operation involves Shallow Jack Hammer Drilling, Blasting, Excavation, Formation of benches, Loading and Transportation of minerals. The above activities may affect the surrounding environment like removal of rock mass, Loss of flora and fauna of the area, surface water discharge, change in air and water quality, etc., If adequate measures are not taken for the proposed operations, it will cause the environmental degradation of the area and it will lead to affect the ecosystem of the surrounding environment.

In order to maintain the existing environmental scenario of the proposed mine lease area it is mandatorily required to assess the present ecology and environment of the proposed mine lease area and buffer area of the project before starting mining operations. The various environmental impacts which are identified by the proposed quarrying activities have been discussed below and its subsequent paragraphs.

- Land Environment
- Water Environment
- Air Environment
- Noise Environment
- Biological Environment
- Socio Economic Environment

DETAILS OF INVESTIGATED ENVIRONMENTAL IMPACTS DUE TO PROJECT LOCATION POSSIBLE ACCIDENTS, PROJECT DESIGN, PROJECT CONSTRUCTION, REGULAR OPERATIONS FINAL DECOMMISSIONING OR REHABILITATION OF A COMPLETE PROJECT.

4.2 LAND ENVIRONMENT

This is a proposed Rough Stone Quarry & Gravel Quarry of Thiru.R.Natarajan, at S.F.Nos. 253/7, 259/5, 259/2 and 259/4 over an extent of 2.31.50 Ha in Karadikudi Village, Anaicut Taluk, Vellore District, Tamilnadu State. The method of mining is Opencast mechanized with a bench width and height of 5m. It is proposed to excavate to 2,08,760 m^3 of Rough Stone and 34,184 m^3 gravel formation upto a depth of 32m (17m Above Ground Level and 15m Below Ground level for the period of five years). There is no stream/odai within the mine lease area.

The main anticipated impact on the Land Environment due to quarrying operation is change in Landscape, change in Land – use Pattern.

The entire mine lease area of 2.31.50 Ha is Patta land. The project area of 1.522 Ha (except unutilized area - 0.59.30 Ha) is proposed to be altered by effective quarrying operation such as excavation (1.50.20 Ha), Infrastructure (0.01.0), Road (0.01.0 Ha) and green belt will be developed in the safety zone of 0.20.0 Ha. The ultimate depth of quarrying is proposed with maximum depth of 32m (17m Above Ground Level and 15m Below Ground level for the period of five years) and will not intersect the ground water table.

4.2.1 MEASURES FOR MINIMIZING AND/OR OFFSETTING ADVERSE IMPACTS IDENTIFIED

<table>
<tr><th>Aspect</th><th>Impact</th><th>Mitigation measures</th></tr>
<tr><td>Topography</td><td>The area applied for quarry lease is exhibits hilly terrain covered by Gravel formation. Quarrying activity will lead to change in geological setting of the area i.e., Due to the quarrying activity in the mine lease area will leads to affect the aesthetic view on the environment. Further, due to the movement of heavy vehicles in and around the mine lease area will leads to affect the surrounding agricultural lands, ecology and biodiversity, human habitations due to the emissions from vehicles like SO_2, NO_x, PM_{10}, $PM_{2.5}$, etc., The existing land use pattern is given as under.
<table>
<tr><th>Land Use</th><th>Present Area (Hect)</th><th>Area in use during the quarrying period (Hect)</th></tr>
<tr><td>Quarrying Pit</td><td>Nil</td><td>1.50.20</td></tr>
<tr><td>Infrastructure</td><td>Nil</td><td>0.01.00</td></tr>
<tr><td>Roads</td><td>Nil</td><td>0.01.00</td></tr>
<tr><td>Green Belt</td><td>Nil</td><td>0.20.00</td></tr>
<tr><td>Unutilized</td><td>2.31.50</td><td>0.59.30</td></tr>
<tr><td>Total</td><td>2.31.50</td><td>2.31.50</td></tr>
</table></td><td>The major impact due to this project on land environment is the change in land use. Mining activity will be carried out upto a depth of 32m (17m Above Ground Level and 15m Below Ground level). At the end of mining period, the quarried pit will act as a water reservoir to store the rain water.
Land Use at the end of mine will be as follows.
<table>
<tr><th>Land Use</th><th>Area in use during the quarrying period (Hect)</th></tr>
<tr><td>Area left for water body</td><td>1.50.20</td></tr>
<tr><td>Green Belt</td><td>0.20.00</td></tr>
<tr><td>Remaining area</td><td>0.61.30</td></tr>
<tr><td>Total</td><td>2.31.50</td></tr>
</table>
At the mine closure stage, 1.50.20 Ha of lease area will be left as rain water harvesting pond, 0.20.0 Ha will be developed with green belt.
Greenbelt shall be developed around the mine lease area and the details has been given below.</td></tr>
</table>

The ultimate pit dimension of the mine lease area is given below.

Ultimate Pit dimension at the end of Mining plan Period			
Pit No.	**Length (max) (m)**	**Width (Avg) (m)**	**Depth (max) (m)**
I	195	77	32m (17m Above Ground Level and 15m Below Ground level)

If mining is not done systematically it will lead to the dumping failure in the mining area.

Year	Species	No. of trees	Area to be covered (Sq.m)	Spacing	Survival
I	Pungai, Vagai, Vembu, Manjal konrai, Naval, Puvarasu	48	480	3m x 3m	80%
II		48	480		
III		48	480		
IV		48	480		
V		48	480		
Total		**240**	**2400**		

The proponent has planned to develop Green belt/Plantation by planting 1,160 Saplings. Out of this, 240 saplings will be planted inside the lease area and remaining 920 saplings are proposed to plant outside the lease area such as at project surrounding schools, temples, road sides, etc.

Due to the thick vegetation around the mine lease area and sprinkling of water around the haul roads the dust emissions arises from the vehicles will be controlled. At the end of mining period, fencing will be provided around the mine lease area to arrest the entry of public/cattle to the mining area.

The Rough stone and Gravel are proposed to quarry 5m bench height and 5m width with 80^0 slope and with conventional opencast-Mechanized method. As per the approved mining plan a safety distance of 7.5m shall be provided. There is no overburden anticipated during the entire Rough Stone and Gravel quarrying operation. The excavated Rough stone and

		Gravel will be directly loaded into tipper to the needy crusher/other buyers.
Drainage	Mine drainage is surface water or groundwater that drains from an active or abandoned mine. One of the adverse impacts of mine drainage is it will contaminate the ground water.	As per the approved mining plan the ultimate pit dimension is 195m (L) x 77m (W) x 32m (D) - 17m AGL & 15m BGL. The ground water table is reported as 50m BGL. During climatic conditions, 50m in summer and 45m in rainy season as observed in nearby bore hole. Quarry operation is confined to 32m (17 m AGL + 15 m BGL) which is well above the water table has been envisaged as workable depth for safe & economic quarrying for the entire lease period. Hence the quarrying operation may not affect the ground water.
Soil Quality and Agriculture	In monsoon seasons due to the excavation of minerals soil erosion and sediment deposition will occur in the nearby water bodies.	It is proposed to quarry upto a depth of 32m (17m AGL & 15m BGL) and the nearby water table is 50m BGL. So, the mining activity will not affect the ground water. To prevent the soil erosion during monsoon season, garland drain will be constructed with silt traps.

Visual impact on surrounding environment	Quarrying activities and rock extraction generally cause several environmental effects on the surrounding areas. The alteration of landscape due to activities like excavation, drilling or blasting, in particular, often generates a visual impact on the receptors set in the surroundings. Among these effects, the shape, extent, or chromatic contrast of the mining surface with the original land form may represent a huge loss of appeal for the growth of new urban settlements.	The reclamation of the post mined quarry surface is aimed at restoring the ecological balance taking into account geological parameters but also local flora and climate. Further the ultimate depth of mining is 32m (17m AGL & 15m BGL). In the post mining stage, the quarried out pit will be used for rainwater harvesting.

4.3 SOLID WASTE GENERATION AND MANAGEMENT

The waste generation in the form of Solid waste (Municipal Waste) is very negligible. A detailed solid waste management system for the project area is given below and the same will be executed by proper awareness and sign boards. The sign boards will be in two language i.e., Vernacular language (Tamil) and common language (English). The plastic waste generation is very negligible and it will be collected from the source level in specific dustbin and disposed through the municipal bins.

- Identification of solid waste generations
- Providing dustbins to collect with different color coding
- Creating awareness among the employees
- Developing common storage yards
- Disposal to the nearby municipal yards
- Record keeping
- Review once in quarter

4.4WATER ENVIRONMENT

4.4.1 Impact on Surface Water Resources

There is no seasonal or perennial Odai within the M.L area. The drainage pattern of the region is plane to sub-dendritic. Surface run-off water of the M.L. area is drained through proposed drainage and collected in the bottom of the quarry and collected water will be used for same quarry operation as such for plantation & dust suppression.

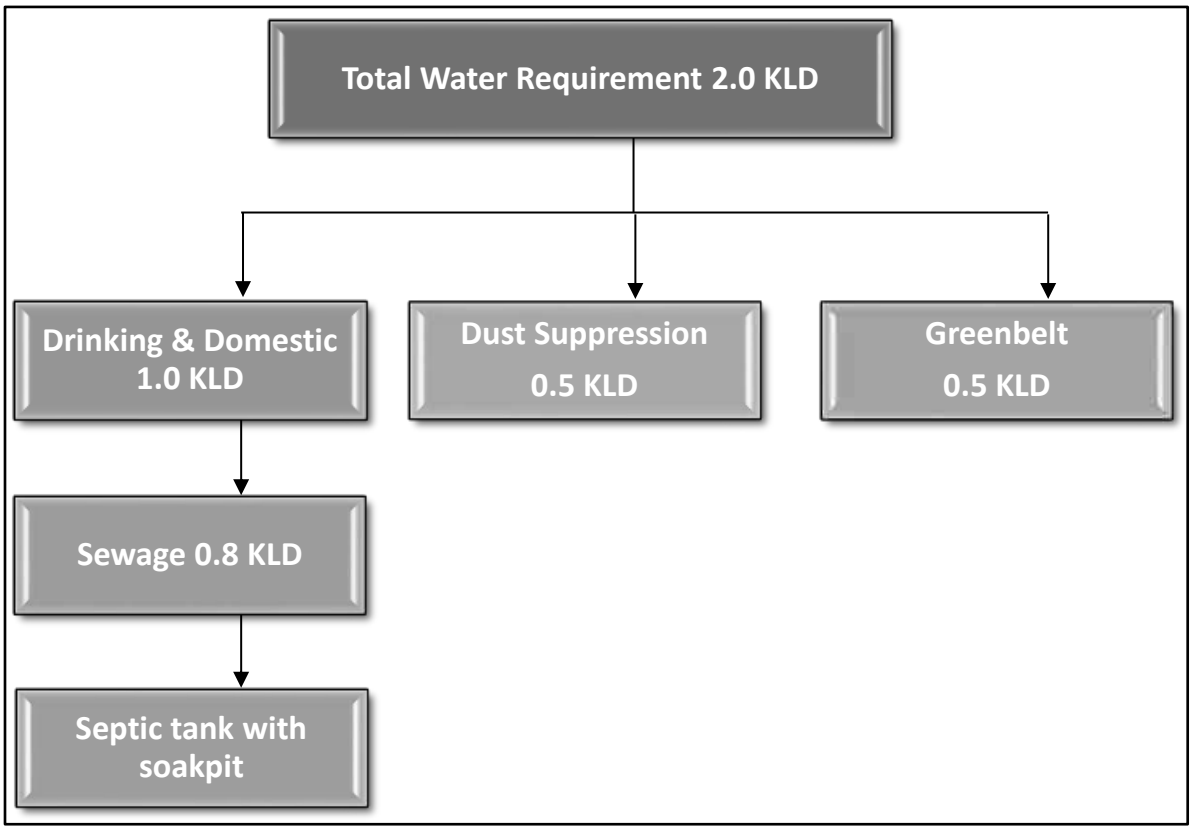
From the proposed site, Periya Eri is located at a distance of 2.00 km in Northwest direction, Agaram Aru is located at a distance of 4.30 km in Northwest direction, Palar River is located at a distance of 7.44 km in Northern direction and Bahuda River is located at a distance of 7.50 km in Northern direction respectively. Water table is found at a depth of 50m in summer and 47m in rainy seasons.

Since these water bodies are located outside the lease area and there is no discharge of effluent or any untreated water from the mines will be made into these water bodies, there is no major impact. The project proponent will restrict the mining operation only within the lease and no other work will be carried out outside the mining lease.

4.4.2 Impact due to Water use in Mines

In this proposed mines, water will be mainly used for Domestic purpose, Dust suppression & Plantation. Total water requirement for the project is 2.0 KLD which will be sourced from nearby vendors (for drinking) & water tanker supply. Negligible sewage of 0.8 KLD will be generated, for which a septic tank with soak pit will be set up. The water balance diagram is given below.

FIGURE - 4.1 WATER BALANCE DIAGRAM



4.4.3 Impact on Ground Water

The mining activity is not likely to intersect ground water as the water table is noticed at the depth of 50m BGL. During climatic conditions, 50m in summer and 45m in rainy season as observed in nearby bore hole. Quarry operation is confined to 32m (17 m AGL + 15 m BGL) which is well above the water table. The mining will go up to the maximum depth of 32m BGL (2m Gravel + 30m Rough Stone). So, there will

be no chance of intersecting the ground water table by the mining activity. So, the impact of mining on the ground water is not envisaged.

4.4.4 Mitigation measures

- Entire lease area will be provided with proper garland drains.
- Check wears will be provided to prevent solids from wash off.
- Construction of garland drains around freshly excavated so that flow of water with loose material is prevented.
- The mine water will be passed through the natural slopes and valleys and gets accumulated in the settling tank (Bottom pit)

4.4.5 Ground water environment in buffer zone

The scenario of ground water in Vellore District, Anaicut Taluk is given below.

Table - 4.1 Ground Water Level Status in Anaicut Firka

S. No.	Firka	Net Annual Ground water availability	Existing gross ground water consumption for irrigation	Existing gross ground water consumption for domestic and industrial water supply	Existing gross ground water consumption for all uses	Stage of ground water development	Category
1	Anaicut	918.08	1,275.55	3.01	1,278.56	139	Over Exploited

Source:nwm.gov.in

It is planned to carryout appropriate rainwater harvesting schemes and artificial recharge schemes in the area.

4.5 BIOLOGICAL ENVIRONMENT

4.5.1 VEGETATION IN THE CORE ZONE

The mine lease area is devoid of major plantation. Shrubs and bushes are majorly found within the lease area. The proponent has planned to develop green belt in safety zone area of 0.20.0 Ha. A total of 240 trees are planned to be planted for a period of 5 Years.

4.5.2 FAUNA

There are no sanctuaries/national parks in the buffer zone of 10km study area. The commonly found fauna in the buffer zone are given in **Chapter 3**. During mining activity the impacts and mitigation measures for Fauna are given in below table.

Table - 4.2 Impacts and mitigation measures for Fauna

S.No.	Impact	Mitigation measure
1	Fauna is affected due to noise and vibration.	Sirens will be blown before blasting in the mines. To reduce noise levels, plantation will be done. Blasting will be carried out only in the allotted time.
2	Dust generation due to mining activities	To reduce dust generation, mist sprayers will be used. During transportation, the material will be covered with tarpaulin. Water sprinkling will be done to reduce generation of pollutants.
3	Change in land use of the lease area	After the mine closure stage, the mine pit will be left as rain water collecting tank, which can attract bird population in the nearby areas.
4	Accidental falling of animals	To prevent entry of animals, the mine lease surrounding area will be properly fenced with barbed wire.

4.5.3 GREENBELT DEVELOPMENT PLAN

The main objective of the green belt is to provide a barrier between the source of pollution and the surrounding areas. In order to compensate the loss of vegetation cover, it is suggested to carry out afforestation program mainly in proposed mine lease area earmarked for plantation program as per Approved Mining Plan in different phases. This habitat improvement program would ensure the faunal species to re-colonize and improve the abundance status in the core zone. Greenbelt/Plantation

will be carried out to enhance the vegetative growth and aesthetic in the safety zone area. The objectives of the green belt cover will cover the following:

- Noise abatement.
- Reuse of waste water to the extent possible.
- Prevention of soil erosion.
- Ecological restoration.
- Aesthetic, biological and visual improvement of area due to improved vegetative and plantations cover.

Table - 4.3 Green Belt Development Plan

Year	No. of trees proposed to be planted	Survival %	Name of the Species	No. of trees expected to be grown
I	24	80%	Pungai, Vagai, Vembu, Manjal konrai, Naval, Puvarasu	20
II	24	80%		20
III	24	80%		20
IV	24	80%		20
V	24	80%		20
Total	**120**			**100**

Nearly 0.20 Ha of area is proposed for Greenbelt development by planting 24 Nos of trees during every year and expected growth is around 20 Nos @ survival rates of 80%. Additionally, proponent proposed to plant 920 saplings outside the lease area such as at project surrounding schools, temples, road sides, etc.

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

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

IRREVERSIBLE AND IRRETRIEVABLE COMMITMENTS OF ENVIRONMENTAL COMPONENTS

4.6AIR ENVIRONMENT

4.6.1 IMPACT DUE TO MINING OPERATION

Impact prediction is a very important phenomenon in evaluating the environmentally potential adverse impacts for any proposed mine project. The impact prediction is always carried out under worst possible conditions so as to mitigate or to eliminate the environmental hazards. These predictions thus calculated are superimposed over the baseline data to calculate the net impact on the environment after the proposed mine Project comes into production.

4.6.2 IMPACT ON AIR ENVIRONMENT

The impacts on air environment from a mining activity depend on various factors like production capacity, machinery involved, operations and maintenance of various equipment's and vehicle. Apart from these, there will be other activities associated viz transportation of mineral and waste, stocking facilities and dump management within the mine lease area that may contribute to pollution.

4.6.3 AIR EMISSIONS

The impacts on air environment from a mining activity depend on various factors like production capacity, machinery involved, operations and maintenance of various equipments and vehicle. Apart from these, there will be other activities associated viz transportation of mineral and waste, stocking facilities and dump management within the mine lease area that may contribute to pollution.

4.6.4 QUANTITATIVE ESTIMATION OF IMPACTS ON AIR ENVIRONMENT

An attempt has been made to predict the incremental rise of various ground level concentrations above the baseline status in respect of air pollution due to proposed is 2,08,760 m^3 of Rough Stone and 34,184 m^3 gravel by the opencast mechanized mining method.

The pollutants released into the atmosphere will disperse in the down wind direction and finally reach the ground at farther distance from the source. The concentration

of ground level concentrations mainly depends upon the strength of the emission source and micrometeorology of the study area.

In order to estimate the ground level concentrations due to the emission from the proposed project, EPA approved Industrial Source Complex ISC AERMOD View Model has been employed.

The mathematical model used for predictions on air quality impact in the present study is ISC-AERMOD View-6.8.6. It is the next generation air dispersion model, which incorporates planetary boundary layer concepts.

The AERMOD is actually a modeling system with three separate components:

AERMOD (AERMIC Dispersion Model), AERMAP (AERMOD Terrain Preprocessor) and AERMET (AERMOD Meteorological Preprocessor).

Special features of AERMOD include its ability to treat the vertical in homogeneity of the planetary boundary layer special treatment of surface releases, irregularly shaped area sources, a plume model for the convective boundary layer, limitation of vertical mixing in the stable boundary layer, and fixing the reflecting surface at the stack base.

The AERMET is the meteorological preprocessor for the AERMOD. Input data can come from hourly cloud cover observations, surface meteorological observations and twice-a-day upper air soundings. Output includes surface meteorological observations and parameters and vertical profiles of several atmospheric parameters.

The AERMAP is a terrain preprocessor designed to simplify and standardize the input of terrain data for the AERMOD. Input data include receptor terrain elevation data. Output includes, for each receptor, location and height scale, which are elevations used for the computation of airflow around hills.

Salient features of the AERMOD model are given hereunder:

- Excavation operations are considered as area sources.
- Transportation of material on haulage roads has been considered as line source

The predicted ground level concentrations for study period computed using AERMOD model are plotted as isopleths.

4.6.5 SOURCES OF DUST EMISSION

The proposed mining is carried out by mechanized opencast method. The air borne particulate matter generated by ore handling operations, transportation and screening of ore is the main air pollutant. The emissions of sulphur dioxide (SO_2), Oxides of Nitrogen (NOx) contributed by diesel operated excavation/loading equipment and vehicles plying on haul roads are marginal. Prediction of impacts on air environment has been carried out taking into consideration proposed production and net increase in emissions. Based on the various operations involved in the production of minerals, the various emission sources have been identified as given below.

a. Area sources.

b. Line sources.

Extraction of mineral from mine, are considered as area sources. Transportation of material from mining benches to various end points are considered as line sources. The impact of above sources on air environment is discussed below:

The other sources of air pollution are the dust generated during the movement of tippers on the haul road. Water tankers with spraying arrangement will be used for regular water sprinkling on the haul roads to ensure effective dust suppression. The tippers are well maintained so that exhaust smoke does not contribute abnormal values of noxious gases and un-burnt hydrocarbons.

4.6.6 EMISSION DETAILS

All the emissions discussed above are quantified for proposed maximum production of is 2,08,760 m^3 of Rough Stone and 34,184 m^3 gravel by the open-cast mechanised mining method. The existing air quality levels are covered in the baseline scenario. Excavation, loading and transportation through tippers are the major sources, which are of significance. Therefore, the emissions considered for modeling are from drilling blasting, excavation & transportation of Rough stone and Gravel.

The emissions are computed based on AP-42 emission factors. Operational hours, activity rate, wind speed and moisture content have been considered for estimation of emissions from point and area sources. For line source, apart from operational hours, activity rate, moisture, silt content and vehicle weight have been considered. Predictions are carried out for the worst-case scenario of simultaneous operation of excavators (area sources) and tippers for transportation from mine pit to loading pit (line sources) over a distance of 500 m.

The number of working days has been taken at 300 days per year with 8 hours of operation/day, hence the concentrations predicted are considered to be the worst case. With control measures, the emissions have been taken at 30% of uncontrolled emissions for handling and 10% of uncontrolled emissions for transportation.

4.6.7 METEOROLOGICAL DATA

The meteorological data recorded continuously during the month of Post Monsoon Season (October 2023 to December 2023) on hourly basis on wind speed, wind direction and temperature has been processed to extract the 24- hourly mean meteorological data as per the guidelines of IMD and MoEF for application of AERMOD model. Stability classes computed for the mean hours is based on guidelines issued by CPCB on modeling. Mixing heights representative of the region have been taken from the available published literature.

4.6.8 SUMMARY OF PREDICTED GROUND LEVEL CONCENTRATIONS

Ground level concentrations due to the mining activities have been estimated to know the incremental raise and extent of impact in the study area.

The maximum ground level concentration within the mine lease area is estimated to be about 0.61 µg/m^3 of PM2.5 & 3.18 µg/m^3 of PM10, whereas cluster concentration is estimated to be about 0.67 µg/m^3 of PM2.5 & 5.36 µg/m^3 of PM10, where mining operations are being carried out. The impact of mining operations would be negligible beyond 0.5 km.

Figure - 4.2 to 4.5 represents the spatial distribution of the predicted ground level concentrations of $PM_{2.5}$ & PM_{10} due to emissions from mine.

4.6.9 EMISSION SOURCES & QUANTIFICATION

Various point and non-point sources of emissions from proposed quarry of Thiru.R.Natarajan and also emission from cluster quarry (Existing + Proposed) are quantified and presented below:

(a) Area Emissions – Total Material handling (Rough Stone & Gravel)

Quantity, m^3/annum	Rough Stone: 208760 m^3 Gravel: 34184 m^3
Operational Hours Per Year	2400
Activity Rate, t/hr.	400.5416667
Emission of dust, g/t.	0.19
Emission of dust, g /hr.	56.0385463
Area of influence, m2	626
Uncontrolled emission rate g/s/m2	0.000035391
Controlled emission rate, PM10 g/s/m2	0.00000353912
Controlled emission rate, PM2.5 g/s/m2	0.0000023594

(b) Area Emissions – Total Material handling (Cluster Rough Stone & Gravel)

Quantity, m^3/annum	**Existing Quarries:** • Tmt.S.Sumathi (1.29.5 Ha) - Rough Stone (19245 m^3) & Gravel quarry (6415 m^3). • Thiru.C.Venkatesan (1.10.0 Ha) - Rough Stone (90,855 m3) & Gravel quarry (3,990 m3). • Thiru.D.Sivakumar (0.33.5 Ha) - Rough Stone (2520 m^3) & Gravel (1008 m^3). • Thiru.T.Balachandar (0.44.0 Ha) - Rough Stone (3525 m^3) & Gravel (1026 m^3). **Present Proposed Quarries** • Thiru.K.Munusamy (2.15.5 Ha) - Rough Stone (41055 m^3) & Gravel (3745 m^3). • Thiru.R.Natarajan (1.05.5 Ha) - Rough Stone (14852 m^3) & Gravel (1550 m^3). • Thiru.R.Natarajan (2.31.5 Ha) - Rough Stone (208760 m^3) & Gravel (34184 m^3). • Tmt.Kasthuri (1.64.0 Ha) - Rough Stone (38393 m^3) & Gravel (4274 m^3).
Operational Hours Per Year	2400
Activity Rate, t/hr.	390.2414
Emission of dust, g/t.	0.20
Emission of dust, g /hr.	59.51436
Area of influence, m2	625
Uncontrolled emission rate g/s/m2	0.000135624
Controlled emission rate, PM10 g/s/m2	0.0001356242
Controlled emission rate, PM2.5 g/s/m2	0.000904161

(c) Line Source – Transport of Rough Stone & Gravel from Pit to Boundary

Quantity, m^3/annum	Rough Stone: 208760 m^3 Gravel: 34184 m^3
Operational Hours Per Year	2400
Capacity of each Dumper (T)	10
Total No. of Tippers/ year	4858
Lead length/trip, Km	1.5
Total VKT/Year	75987
Emission Kg/VKT	0.22
Total emission Kg/Year	19989.04
Uncontrolled emission rate g/s/m	58985
Controlled emission rate, PM10 g/s/m	0.589854
Controlled emission rate, PM2.5 g/s/m	0.212347

(d) Cluster Line Source – Transport of Rough Stone & Gravel from Pit to Boundary (Cluster)

Quantity, m^3/annum	**Existing Quarries:** • Tmt.S.Sumathi (1.29.5 Ha) - Rough Stone (19245 m^3) & Gravel quarry (6415 m^3). • Thiru.C.Venkatesan (1.10.0 Ha) - Rough Stone (90,855 m3) & Gravel quarry (3,990 m3). • Thiru.D.Sivakumar (0.33.5 Ha) - Rough Stone (2520 m^3) & Gravel (1008 m^3). • Thiru.T.Balachandar (0.44.0 Ha) - Rough Stone (3525 m^3) & Gravel (1026 m^3). **Present Proposed Quarries** • Thiru.K.Munusamy (2.15.5 Ha) - Rough Stone (41055 m^3) & Gravel (3745 m^3). • Thiru.R.Natarajan (1.05.5 Ha) - Rough Stone (14852 m^3) & Gravel (1550 m^3). • Thiru.R.Natarajan (2.31.5 Ha) - Rough Stone (208760 m^3) & Gravel (34184 m^3). • Tmt.Kasthuri (1.64.0 Ha) - Rough Stone (38393 m^3) & Gravel (4274 m^3).
Operational Hours Per Year	2400
Capacity of each Dumper (T)	10
Total No. of Tippers/ year	18619
Lead length/trip, Km	0.9
Total VKT/Year	20913
Emission Kg/VKT	0.25
Total emission Kg/Year	248614
Uncontrolled emission rate g/s/m	8137454
Controlled emission rate, PM10 g/s/m	0. 8137454
Controlled emission rate, PM2.5 g/s/m	0.2260404

Note: *Emission factor computed based on wind speed of 2 m/s, and moisture content of 10 %. + Emission factor computed based on silt content of 10 % and moisture content of 10 %.

FIGURE - 4.2 ISOPLETH OF GLC PREDICTION FOR $PM_{2.5}$

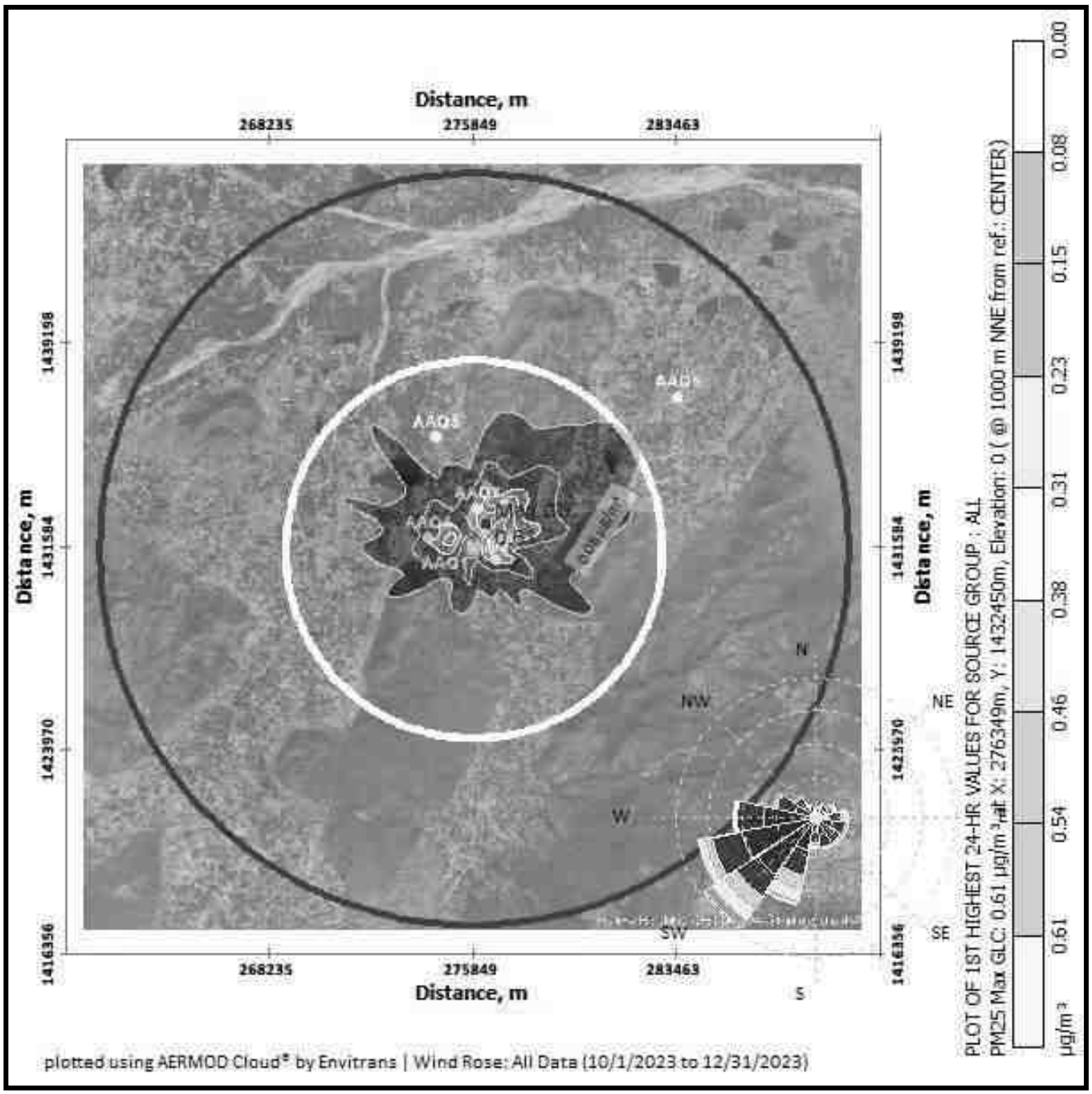


FIGURE - 4.3 ISOPLETH OF GLC PREDICTION FOR PM_{10}

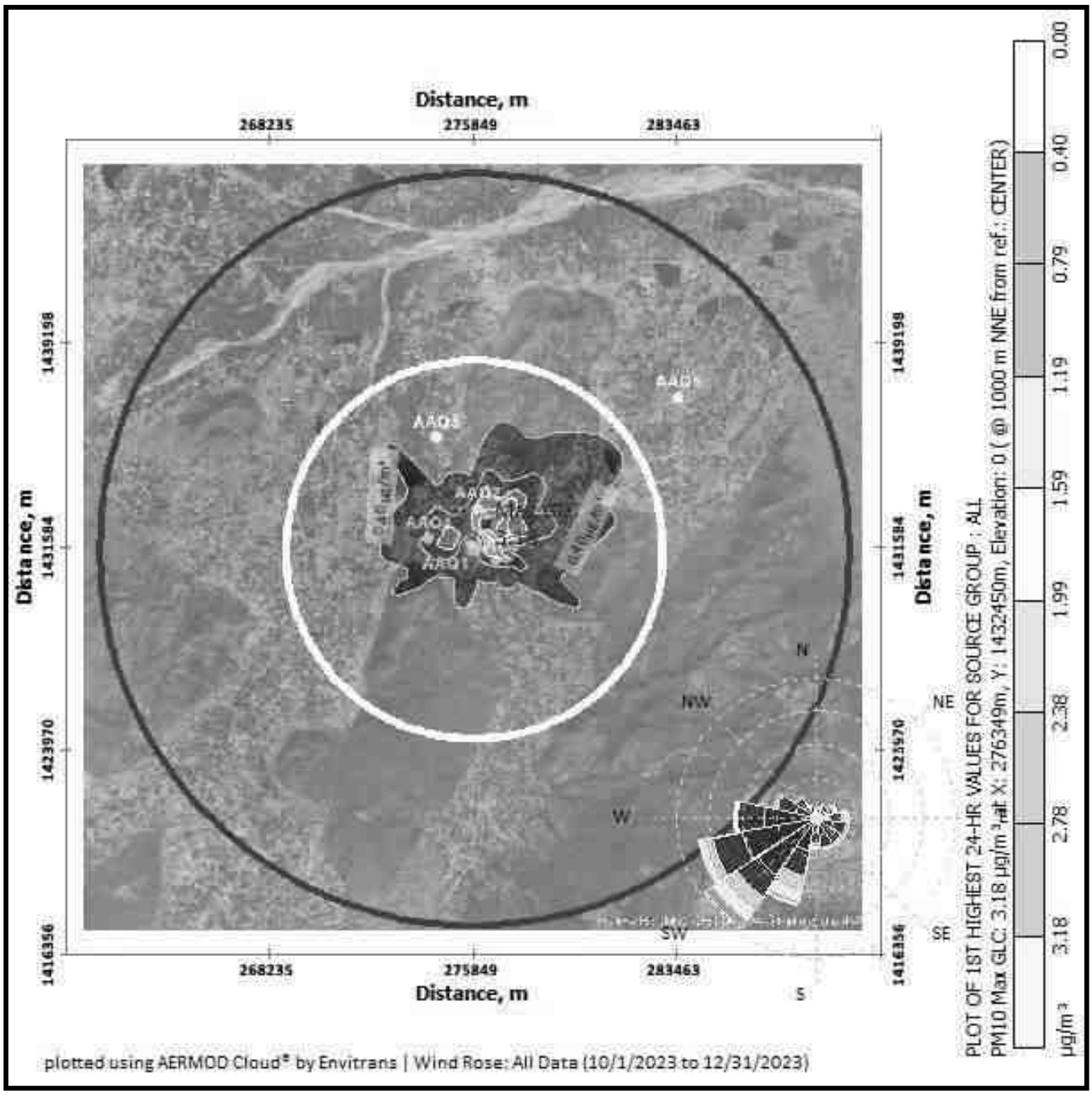


FIGURE - 4.4 ISOPLETH OF GLC PREDICTION –CUMULATIVE FOR $PM_{2.5}$

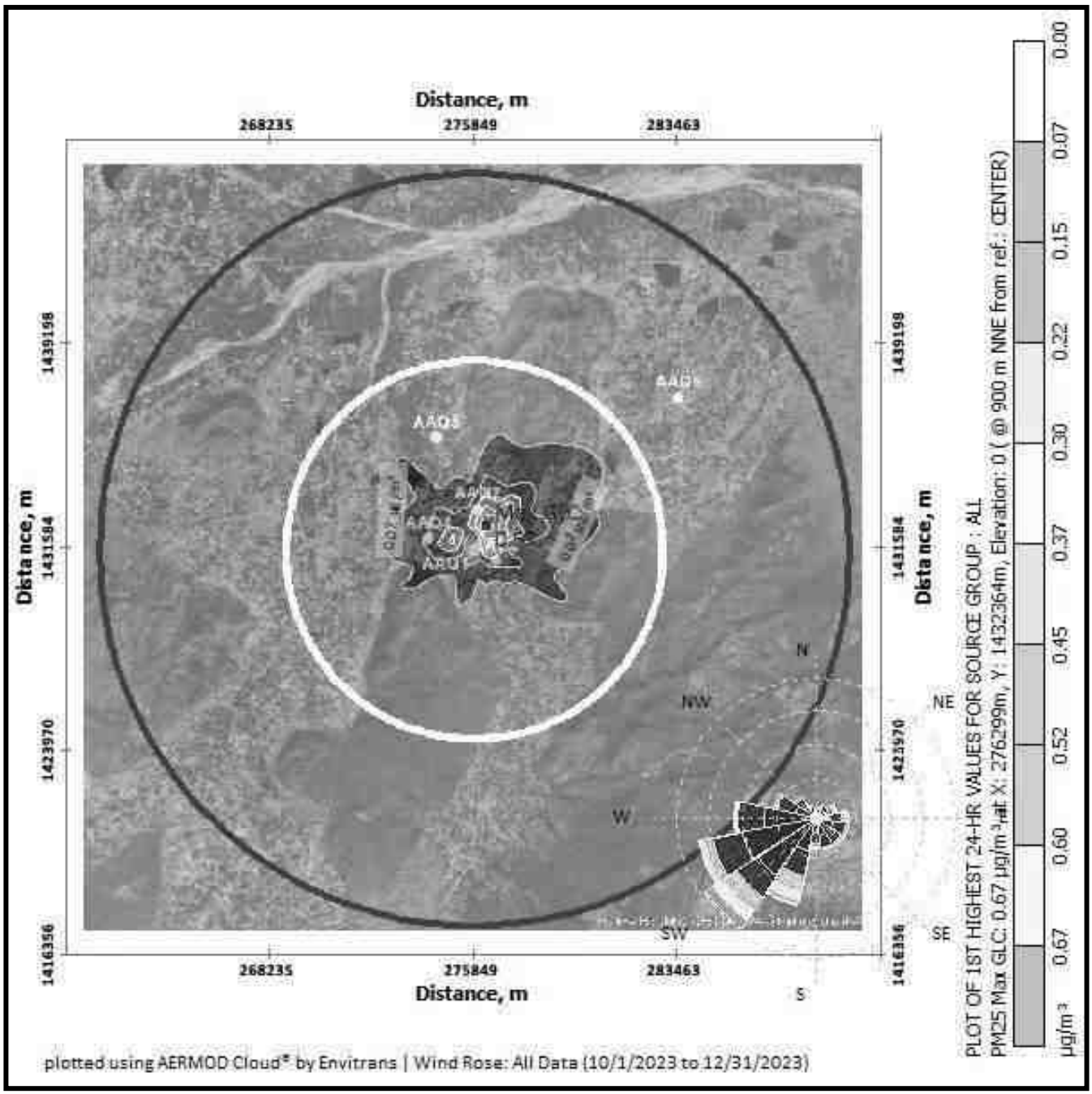
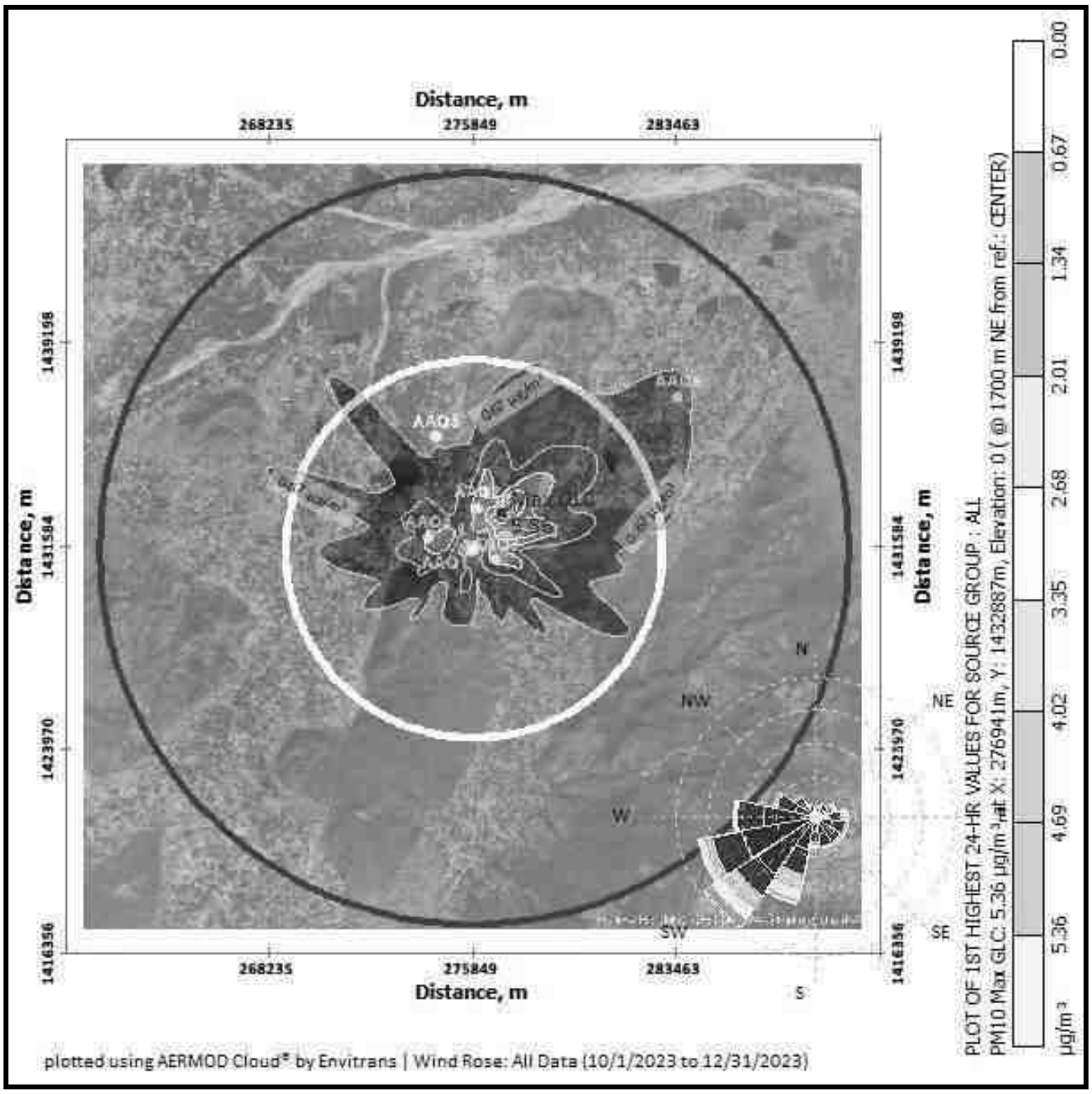


FIGURE - 4.5 ISOPLETH OF GLC PREDICTION –CUMULATIVE FOR PM_{10}



4.6.10 Predicted Ambient Air Quality:

The post project Concentrations of PM10, PM2.5, (GLC) (base line + incremental) after adopting necessary control measures is given in **Table - 4.4 to 4.7**.

Table - 4.4 Concentrations of PM2.5 after Project Implementation

SL. No	Location	Background Concentration	Predicted incremental Concentration	Post Project Concentration	Statutory Limits in µg/m³
1	Within Mine Lease area	27.3	0.61	27.91	60
2	Thangal	24.0	0.54	24.54	
3	Pichanatham	23.4	0.45	23.85	
4	Karadikudi	25.4	0.38	25.78	
5	Odiyathur	23.95	0.15	24.1	
6	Anaicut	22.5	0.10	22.6	

Table - 4.5 Cluster Concentrations of PM2.5 after Project Implementation

SL. No	Location	Background Concentration	Predicted incremental Concentration	Post Project Concentration	Statutory Limits in µg/m³
1	Within Mine Lease area	27.3	0.67	27.97	60
2	Thangal	24.0	0.60	24.6	
3	Pichanatham	23.4	0.52	23.92	
4	Karadikudi	25.4	0.37	25.77	
5	Odiyathur	23.95	0.30	24.25	
6	Anaicut	22.5	0.22	22.72	

Table - 4.6 Concentrations of PM10 after Project Implementation					
SL. No	**Location**	**Background Concentration**	**Predicted incremental Concentration**	**Post Project Concentration**	**Statutory Limits in µg/m³**
1	Within Mine Lease area	58.65	3.18	61.83	100
2	Thangal	51.15	2.78	53.93	
3	Pichanatham	46.8	2.38	49.18	
4	Karadikudi	51.9	1.99	53.89	
5	Odiyathur	52.25	0.79	53.04	
6	Anaicut	49.8	0.40	50.02	

Table - 4.7 Cluster Concentrations of PM10 after Project Implementation					
SL. No	**Location**	**Background Concentration**	**Predicted incremental Concentration**	**Post Project Concentration**	**Statutory Limits in µg/m³**
1	Within Mine Lease area	58.65	5.36	64.01	100
2	Thangal	51.15	4.69	55.84	
3	Pichanatham	46.8	4.02	50.82	
4	Karadikudi	51.9	2.68	54.58	
5	Odiyathur	52.25	2.01	54.26	
6	Anaicut	49.8	0.67	50.47	

The above report seems that, even in the worst-case scenario, the resultant added concentrations with baseline figures show that the values of ambient air quality for PM_{10} are in the range of 49.18 µg/m³ to 61.83 µg/m³ and for $PM_{2.5}$ are in the range of 22.60 µg/m³ to 27.91 µg/m³; whereas the cluster concentrations values for PM_{10} are in the range of 50.47 µg/m³ to 64.01 µg/m³ and for $PM_{2.5}$ are in the range of 22.72 µg/m³ to 27.97 µg/m³ which are within the statutory limits in each case. The mitigation measures undertaken in the mine for control of air pollution are given below.

- Wet drilling will be practiced in drilling operation.
- Water sprinkling will be done in haul roads & loading etc.
- The mines workers are provided with the dust masks.
- Three layer plantation in the safety zone.
- DG sets shall be periodically maintained as per manufacturer's specifications.

ASSESSMENT OF SIGNIFICANCE OF IMPACTS (CRITERIA FOR DETERMINING SIGNIFICANCE, ASSIGNING SIGNIFICANCE).

4.7NOISE ENVIRONMENT

The main noise generating source during mining operation and related activities are drilling, excavation, loading and transportation. Intermittent noise is generated due to operation of diesel generator.

4.7.1 Likely Noise Levels in Lease Area due to mining activity

S.No.	Source Name	Noise Level in dB (A)
1	Diesel generator	90
2	Excavator Operation	86
3	Trucks movement	82
4	Drilling	96
5	Blasting	102

It is expected that the generated noise will be limited within the mine lease area and there will be no profound effect of noise on the buffer zone. The noise level will be maintained below the threshold limit by vigorous maintenance of the machineries. Wet drilling with dust extractor is being used to reduce the noise level during the mining operation.

Noise levels were measured in the lease area and in the nearby villages like Thangal, Pichanatham, Karadikudi, Odiyathur & Anaicut. The values are given below.

Table - 4.8 Noise Levels in Monitoring Locations

S. No.	Location	Distance and direction from Mine lease area	Day Equivalent (in dBA)	Night Equivalent (dBA)
1	Within Mine Lease area	Core Zone	44.6	37.3
2	Thangal	1.04 km, N	46.9	37.7
3	Pichanatham	1.08 km, SE	45.8	38.6
4	Karadikudi	1.12 km, W	44.8	37.1
5	Odiyathur	3.09 km, NW	48.3	38.3
6	Anaicut	6.08 km, NE	47.5	38.3

The above noise levels are within the CPCB limits of 75 dB(A) in the working area (core zone) and 55 dB(A) in the buffer areas during the day time. Since, the five buffer areas are considered as 'Residential area' as mentioned above, whereas during mining operation mine lease area will be considered as 'Industrial area' for which DGMS norms of 85 dB(A) / CPCB guidelines of 75 dB(A) are followed.

4.7.2 Impact of Noise due to mining

- Noise generation in mining is due to operation like drilling, blasting and transportation of minerals within and outside the lease area.
- As per DGMS (Directorate General of Mines Safety) limits, the acceptable noise level is 85 dB(A) for an exposure period of 8 hours.
- Exposure to loud noise can also cause high blood pressure, heart disease, sleep disturbances and stress. Noise pollution also impacts the health and well-being of wildlife.
- Noise exceeding prescribed limits may cause impairment like abnormal loudness perception, tinnitus which causes a persistent high-pitched ringing in the ears, paracusis or distorted hearing.

4.7.3 Mitigation Measures for Noise level control

- The DG set will be kept within the acoustic enclosure made by the stone blocks.
- Drills will be equipped with sharp bits and wet drilling will be adopted.
- As the distance between the source and receptor increases, the noise level decreases. Hence, there will be a natural attenuation.
- The proponent has planned to develop green belt in the periphery of the lease area which diminishes sound volume by dampening them.
- All the equipment/machinery/tippers involved will be properly maintained to control noise generation.
- Conducting regular health checkups for employees involved.
- Employees will be made to work on shifts to reduce their exposure time.
- Use of ear muffs by the workers with occupational exposure to noise.
- Providing green walls/nets wherever possible.

By adopting these measures, the noise levels will be maintained well within MoEF&CC limits since the baseline value is low.

4.8 GROUND VIBRATION

There will be negligible vibration of ground due to the following activities.

- Due to Blasting
- Due to Drilling
- Due to movement of machinery

4.8.1 Impacts due to Vibration

- Though vibration will be only felt by the people working inside the lease area it is usually undesired.
- Vibration may also cause flyrocks.
- It may frighten the birds and small insects in the lease area. However, it will be felt only for a short period.

4.8.2 Mitigation measures for control of Vibration

- Proper quantity of explosive, suitable stemming materials and appropriate delay system should be adopted to avoid overcharging and for safe blasting;
- Adequate safe distance from blasting should be maintained as per DGMS guidelines;
- Blasting shelter should be provided as per DGMS guidelines;
- Carrying out blasting on limited scale, only from 12:00 PM to 2:00 PM
- Proper warning system before blasting will be adopted and clearance of the area before blasting will be ensured
- The charge per delay shall be minimized and preferably more number of delays will be used per blasts;
- Drilling parameters like depth, diameter and spacing will be properly designed to give proper blast;
- Control of fly rock and vibration by maintaining peak particle velocity within the standard as prescribed by the DGMS and MOEF&CC.
- Supervising blasting by competent and statutory Foreman/ Mines Manager.

4.9 SOCIO ECONOMIC IMPACT

The lease area is Patta land registered in the name of applicant vide patta no. 757 & 943. No rehabilitation is needed. Hence, there is no negative impact. The proponent has planned to spend INR 5,00,000/- Lakhs @ 2% of the project cost for CER activities (usually for the Govt. School development). This amount will be subjected to change after public hearing.

4.10 OCCUPATIONAL HEALTH & SAFETY

4.10.1 Impacts on humans due to various mining activities

The occupational risk due to proposed mining will be due to drilling, blasting, excavation and transportation. A total of 24 workers will be engaged in the mining activity. Mining activity may cause various health problems to the mines workers as follows:

- Dust generated during excavation, drilling, stone cutting, sizing and transportation may cause health problems like Silicosis, Asthma, Tuberculosis and other respiratory lungs disorders.
- Heavy weight lifting by the workers may cause injuries to arms, legs and back.
- Noise generated during the mining activity may cause Noise Induced Hearing Loss (NIHL).

Table - 4.9 Impacts on humans due to various mining activities

S.No.	Type of activity	Impact
1	Dust generation due to drilling and blasting	Continuous exposure to dust causes Pneumonia, Tuberculosis, Rhematic arthritis and Segmental Vibration
2	Noise generation due to drilling and blasting	Short term impact cause lack of sleep, high blood pressure and heart ailments. Long term exposure may lead to partial or permanent deafness
3	Unexpected accidents	Risks include fly rocks, cracks or fissures due to improper mining methods

4.10.2 Mitigation measures

- The mines worker will be provided with dust mask to minimize the inhalation of the dust.
- Water sprinkling twice in a day is in practice on the haul roads, near excavation and roads to reduce the fugitive dust emission.
- Wet drilling and drilling with dust extractor will be practiced.
- Ear muffs will be supplied to the workers working in the noise prone area
- The mining site will be supplied with first aid facilities and the entire mines worker will have access to that.
- The mines workers will be well trained about the safety practices in the mining activities.
- As per Mines Rules, 1955, medical examination of employees at the initial stage and periodically, shall be done by a team of qualified medical officers provided by the project proponent.
- Regular medical checkup camps shall also be arranged for detection of occupational diseases and minor disease in the nearby rural population.
- Free checkup and medicine for treatment for their acute and chronic illness shall be provided by the lessee. Conducting periodical Medical Examination as per DGMS.
- Keeping fire extinguisher in place
- Educating the employees about how to handle unexpected happenings
- Posting information containing emergency contact numbers in mines office
- By adopting all these measures, the safety of the employees working in the quarry will be ensured.

4.11 WASTE MANAGEMENT

4.11.1 Solid Waste

Since the entire mined out material will be utilized, there will not be any solid waste generation from this project. However, the Solid waste (MSW) generated from administrative activities will be properly collected and disposed to Govt. Authorized yards / Re-cylers / Disposers.

4.11.2 Liquid Waste

There is no process effluent generation from this mine. Hence no liquid waste is generated. Domestic wastewater i.e 0.8 KLD will be discharged in soak pit via septic tank.

4.11.3 Hazardous Waste Management

In this project the following management practices will be followed:

In the quarrying operation, the source of hazardous waste is from machinery maintenance activities that are waste oil / Waste lubricants / Used filters / Used Hydraulic horses. The said hazardous waste are very negligible quantity, it will be properly collected in the source level, stored in impervious storage yards and disposed of as per the Hazardous waste (Trans-boundary Movement) Management Rules, 2016.

4.11.4 Plastic Waste

Single use plastics / use and throwaway plastics will be banned in the site as directed by the Tamil Nadu Government vide GO(Ms)No.84 regarding ban on use of plastic products. The employees will be encouraged to use compostable material or reusable material.

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CHAPTER - 5

ANALYSIS OF ALTERNATIVES

5.1 DESCRIPTION OF EACH ALTERNATIVE

Analysis of alternative site helps in selection of best possible site for the project. On one hand it helps to closeness to the existing infrastructure and on other hand it also helps to minimize the impact of project on environment.

5.2 SUMMARY OF ADVERSE IMPACTS OF EACH ALTERNATIVE

The project proponent has prepared mining plan under rule 19(1), 41 & 42 of Tamil Nadu Minor Mineral Concession Rules, 1959 and the same has been approved by the Assistant Director, Dept. of Geology & Mining, Vellore vide Rc.No.71/2022(Mines) dated 13.01.2023.

- There is no forest land or other Eco-sensitive places.
- Proposed mine site is selected on the basis of occurrence of mineral for suitable end use.

Hence seeking alternative site is not required.

5.3 MITIGATION MEASURES PROPOSED FOR EACH ALTERNATIVE

The mining technology is mechanized Opencast in single-shift operation without any change in technology. The operation will be carried out as per DGMS norms. No alternate technology will be used. Details of the technology used are given in Chapter 2.

5.4 SELECTION OF ALTERNATIVE

In case of Mining projects alternate site selection is not necessary as the mining is site specific and the area in which mining will be carried out has been adequately proved for presence of mineral. The deposit is also having good infrastructural facilities for access and development.

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CHAPTER - 6

ENVIRONMENTAL MONITORING PROGRAMME

6.1 TECHNICAL ASPECTS OF THE MONITORING THE EFFECTIVENESS OF MITIGATION MEASURES (INCL MEASUREMENTS, METHODOLOGIES, FREQUENCY LOCATION DATA ANALYSIS, REPORTING SCHEDULES EMERGENCY PROCEDURES DETAILED BUDGET AND PROCUREMENT SCHEDULES)

6.1.1 ENVIRONMENTAL MONITORING

Monitoring is done to measure the efficiency of control measures implemented. Regular monitoring of various environmental parameters like air, water, noise and soil environments is needed to assess the status of environment during the project operation.

A schedule is framed with timeline to monitor various parameters during the operation of the project. The schedule is framed based on MoEF&CC and Tamil Nadu State Pollution Control Board. In case the SEIAA/TNPCB/MoEF&CC or other statutory bodies demand monitoring of any additional parameter/factor, the same will also be done.

The proposed quarry is a small quarry. Hence the Mines-in-charge will be responsible for environmental related activities. After obtaining EC, the conditions mentioned in EC will be strictly followed. The Mines-in-charge will be responsible for implementing the conditions. EC compliance report will also be submitted periodically.

6.1.2 OBJECTIVES OF ENVIRONMENTAL MONITORING

The objectives of Environmental Monitoring are as follows.

- Monitoring and analysis of air and water samples
- Implementing the control and protective measures.
- Coordinating the environment related activities within the project as well as with outside agencies. Collecting statistics of health of workers and population of the surrounding villages. Green belt development etc.
- Monitoring the progress of implementation of Environmental Management Programme.

- Monitoring the noise generation in and around the project areas.
- Monitoring of wastewater treatment and disposal of solid waste.
- The laboratory will be suitably equipped for sampling/testing for various environmental pollutants.

6.1.3 ENVIRONMENTAL MONITORING SCHEDULE

To evaluate the effectiveness of Environmental Management Programme, regular monitoring of the important environmental parameters will be taken up. The frequency of monitoring different parameters is given in Table below.

Table - 6.1 Environmental Monitoring Schedule

Sl. No.	Description of Parameters	Parameters	Frequency
1	Air	Air Quality for SPM, PM10, PM2.5, SO_2 and NO_x	24 hour average samples once in a 3 month
2	Water	General, Physical, and chemical parameters	Once in a season
3	Noise	L_{eq}, L_{max}, L_{min}, L_{eq} Day & L_{eq} Night dB(A)	8 hour average samples once in a 3 month
4	Soil	Physical and Chemical characteristics	Once in a season

6.1.4 ENVIRONMENT MONITORING LOCATION

Monitoring of the above-mentioned environmental parameters would be done at appropriate and sensitive areas. The exact location of monitoring is given in **Figure 3.5, 3.12, 3.12a, 3.14, 3.16**.

6.1.5 MEASUREMENT METHODOLOGY

(a) Ambient Air Quality

Ambient air quality will be monitored for SO_2, NO_x, PM_{10} and $PM_{2.5}$. The instruments like High Volume Air Samplers and Respirable Dust Samplers would be used for this purpose. These parameters will be monitored as mentioned in the monitoring schedule previously.

(b) Water Quality

Water Quality Analysis will be done quarterly and the monitored parameters include pH, Temperature, TDS, etc. as specified by SPCB from time to time.

(c) Noise Monitoring

Noise level will be monitored in working environment mainly noise producing sources over the boundary and around the mining areas.

(d) Green Belt and Afforested Areas

Continuous vigilance and monitoring of green belt will be done for performance and survival rate of the saplings. Watch and ward personnel will properly guard the plantation. Provision will be made for fertilizers application and watering on schedule.

(e) Socio-Economics

Present Socio-Economics status of the core and buffer zone details are elaborated in **Chapter-3**. Socio-economic study are conducted to know the status of the villages, nearby towns & other change in amenities/services etc.

6.1.6 TECHNICAL ASPECTS OF MONITORING THE EFFECTIVENESS OF MITIGATION MEASURES

The above monitoring schedule will be followed periodically. After collection of the data, the mines-in-charge will analyze the data obtained. The data thus obtained will be incorporated in the EC Compliance report submitted to the Regional office, MoEF&CC. The measurement methodologies will be as per CPCB/BIS/MoEF&CC/DGMS norms.

6.1.7 EMERGENCY PROCEDURES

In case of any emergency due to environmental conditions, the mines in-charge will immediately report to the top-level management and the emergency response protocol will be implemented as per MoEF&CC/ SPCB / DGMS norms.

6.1.8 REPORTS TO BE GENERATED

The Project Proponent will maintain records of each test and its interpretation so as to formulate an adequate Environmental Management Plan. The set of records planned to be maintained by Project Proponent are given in below table.

Table - 6.2 Important Records to be maintained by PP

S.No.	Particulars
1	Monitoring results for Air, Water & Soil etc.
2	Records of slope failure, land erosion & drainage.
3	Plantation Records
4	Environmental and related standards/ norms
5	Records pertaining to statutory consents, approvals.
6	Periodic Medical examination (PME) records.
7	Complain register (Environmental pollution)
8	Records on water and electricity consumption
9	Periodic progress records.
10	Environmental Expenses Records

6.1.9 DETAILED BUDGET AND PROCUREMENT SCHEDULES

The revised budget planned for environmental monitoring is given below.

Table - 6.3 Environmental Management Plan Budget

Sl. No	Budget planned for	Capital cost (INR)	Recurring Cost /Annum (INR)
Air Environment			
1	Haul Road Maintenance	0.23	0.23
2	Water Sprinkler Arrangement	8.00	0.75
3	AAQ Monitoring	0.00	0.50
4	Control Blasting (Muffle blasting)	0.00	0.08
5	Wet Drilling	1.50	0.15
6	No overloading of trucks/tippers/tractors	0.00	0.05
7	Stone carrying trucks will be covered by tarpaulin	0.00	0.14
8	Enforcing speed limits of 20 km/hr within ML area	0.15	0.00
9	Regular monitoring of exhaust fumes as per RTO norms	0.00	0.05
10	Regular sweeping and maintenance of approach roads for at least about 200 m from ML Area	0.00	5.56
11	Installing wheel wash system near gate of quarry	0.50	0.20
Sub-Total (A)		**10.38**	**7.71**

Noise Environment			
12	Provision for Portable blaster shed	0.50	0.04
13	NONEL Blasting will be practiced to control Ground vibration and fly rocks	0.00	5.33
Sub-Total (B)		**0.50**	**5.37**
Water Environment			
14	Provision for garland drain @ Rs. 10,000/- per Hectare with maintenance of Rs. 5,000/- per annum	0.23	0.05
15	Installation of Bio toilet (Portable)	2.00	0.20
16	Sump Maintenance	0.00	0.20
17	Dewatering Cost	0.00	2.00
Sub-Total (C)		**2.23**	**2.45**
Implementation of EC, Mining Plan & DGMS Condition			
18	Waste management (Spent Oil, Grease etc.,)	0.35	0.23
19	Environmental Parameters Display Board	0.20	0.02
20	Issue of PPE's	0.96	0.24
21	IME & PME Checkup	0.00	0.24
22	First Aid facility Provision	0.00	0.09
23	Signage & boards for safety precautions	0.10	0.02
24	Barbed Wire Fencing to quarry area	4.63	0.10
25	Parking yard Management	1.16	0.10
26	Installation of CCTV cameras in the mines and mine entrance	0.30	0.05
27	Implementation as per Mining Plan and ensure safe quarry working (Statutory)	0.00	10.80
28	Slope Stability	5.00	0.50
Sub-Total (D)		**12.70**	**12.39**
GREEN BELT			
29	Plantation inside ML area (240 Nos.)	0.48	0.07
30	Plantation outside ML area (920 Nos.)	2.76	0.28
Sub-Total (E)		**3.24**	**0.35**
Additional Key EMP Expenses			
31	Constructing Rainwater Harvesting Structure	5.00	0.10
32	Environmental Awareness Programme	0.50	0.00
33	Mine Closure Plan	5.00	0.00
34	District Green Fund	20.70	0.00
Sub-Total (F)		**31.20**	**0.10**
Grand Total (A+B+C+D+E+F)		**60.25**	**28.37**

The revised total EMP Cost is 217.01 Lakhs for a period of five years have been proposed. i.e., Capital cost of Rs.60.25 Lakhs + Recurring cost of Rs.156.76 lakhs (For Five years).

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CHAPTER - 7

ADDITIONAL STUDIES

The additional studies covered for this EIA / EMP report are,

- Public consultation
- Risk Assessment
- Cumulative Environmental Impact Assessment Study
- Hydrogeological Study
- Slope Stability plan
- Disaster Management Plan
- Mine Closure plan

7.1 PUBLIC CONSULTATION

After the preparation of the draft EIA/EMP report, it must be submitted to the State Pollution Control Board. A public consultation will be conducted on behalf of the Pollution Control Board through the District Collector and the officials from the PCB. A prior notice must be issued about the event, along with the time and date, in two leading newspapers. The opinions, suggestions, demands, and objections of people, NGO environmentalists, etc. are sought, and the proceedings are recorded. The replies of the proponent and corresponding officials will be recorded in the final EIA/EMP report.

7.2 RISK ASSESSMENT & MANAGEMENT

(a) Objectives

Risk assessment is a method in method in which possible threats/hazards which may arise during mining operations are identified so that adequate machinery/equipment are made available in precaution. The objectives of environmental risk assessment are governed by the following, which excludes natural calamities:

- To identify the potential hazardous areas so that necessary design safety measures can be adopted to minimize the probability of accidental events.
- To identify the potential areas of environmental disaster which can be

prevented by proper design of the installations and its controlled operation.

- To manage the emergency situation or a disastrous event, if any, from the mining operation.

(b) The major hazards related to the mining activities are as follows

- Open cast bench slope failure
- Accident due to fall of quarry sides
- Accident due to machineries
- Accident due to explosives
- Accident due to large block cutting, separation and loading

Some of the common hazards are identified and the corresponding precautionary measures are drafted.

Table - 7.1 Hazards and Precautionary measures

S.No.	Hazard	Precautionary measures
1	Fire	Fire suppressants will be made available at mines office and explosive storage room.
2	Explosion	Controlled blasting will be done. DGMS norms will be strictly followed during blasting. Blasting will be done only by trained professionals.
3	Combustion of chemicals or hazardous substances	Combustible Substances are stored with all precautionary measures. Fire suppressant is made available at storage site
4	Landslide	Width, height and slope will be maintained as suggested by DGMS
5	Accidents during handlings	All vehicles will be properly maintained. Overloading will not be done. Only trained/certified people will be employed.
6	Accidental fall of people or animals	The lease area will be fenced properly. Only people working in the mines will be permitted to enter.

7.3 CUMULATIVE ENVIRONMENTAL IMPACT ASSESSMENT STUDY

As per the Letter received from Dept. of Geology and Mining, Vellore stating the quarry details within 500m radius (**Refer Annexure – 3**) there are four existing, two expired, two abandoned and four proposed quarries are located. The details are given in below table.

Table - 7.2 500m Radius Cluster Mines Details (as per 500m certificate)

Sl. No	Name and address	Village and Taluk	S.F.Nos.	Extent (in Ha)	Period of lease
Existing Quarries					
1	S.Sumathi	Karadikudi Anaicut	252/5	1.29.5	15.03.2018 to 14.03.2023
2	C.Venkatesan	Karadikudi Anaicut	147/11	1.10.0	18.04.2018 to 17.04.2023
3	D.Sivakumar	Karadikudi Anaicut	258/8	0.33.5	11.02.2019 to 10.02.2024
4	T.Balachandar	Karadikudi Anaicut	253/6	0.44.0	05.07.2021 to 04.07.2026
Expired Quarries					
1	D.Sivakumar	Karadikudi Anaicut	425/11	1.24.5	20.10.2014 to 19.10.2019
2	R.Natarajan	Karadikudi Anaicut	254/4	0.34.0	10.05.2017 to 09.05.2022
Abandoned Quarries					
1	K.Giridharan	Karadikudi Anaicut	242/2,4,8 &6A	1.36.0	07.06.2010 to 06.05.2015
2	R.Natarajan	Karadikudi Anaicut	246/1,251/3A, 253/4	2.69.0	18.07.2011 to 17.07.2016
Present Proposed Quarries:					
1	K.Munisamy	Karadikudi Anaicut	255/2,7 & 358/2	2.15.5	
2	R.Natarajan	Karadikudi Anaicut	251/3A	1.05.5	
3	R.Natarajan	Karadikudi Anaicut	253/7,259/2,4 &5	2.31.5	
4	Tmt.Kasthuri	Karadikudi Anaicut	253/4	1.64.0	

As seen above, although the individual lease area of this project is less than 5 Ha, the existing & proposed quarries within a 500m radius, along with this subject project, add up to **10.33.5 Ha** (>5 Ha). A map showing the existing and proposed quarry located within 500m radius is given in **Figure - 1.1 of Chapter 1**.

The baseline monitoring conducted for this project reflects the cumulative impact of the existing quarry, considering that the lease period of the existing quarry will be

coming to an end shortly.

The drilling, blasting, excavation, and transportation activities in both the proposed and the existing quarries as a cluster are expected to have the cumulative impact. These quarry operations are also expected to have significant effects on the air, water, noise environment, and Socio-economic environment.

7.3.1 AIR ENVIRONMENT

Various point and non-point sources of emissions from all the Existing and Proposed quarries within 500m radius are quantified for cumulative impact and presented below:

(a) Area Emissions - Total Material handling (Cluster)

Quantity, m^3/annum	**Existing Quarries:** • Tmt.S.Sumathi (1.29.5 Ha) - Rough Stone (19245 m^3) & Gravel quarry (6415 m^3). • Thiru.C.Venkatesan (1.10.0 Ha) - Rough Stone (90,855 m^3) & Gravel quarry (3,990 m^3). • Thiru.D.Sivakumar (0.33.5 Ha) - Rough Stone (2520 m^3) & Gravel (1008 m^3). • Thiru.T.Balachandar (0.44.0 Ha) - Rough Stone (3525 m^3) & Gravel (1026 m^3). **Present Proposed Quarries** • Thiru.K.Munusamy (2.15.5 Ha) - Rough Stone (41055 m^3) & Gravel (3745 m^3). • Thiru.R.Natarajan (1.05.5 Ha) - Rough Stone (14852 m^3) & Gravel (1550 m^3). • Thiru.R.Natarajan (2.31.5 Ha) - Rough Stone (208760 m^3) & Gravel (34184 m^3). • Tmt.Kasthuri (1.64.0 Ha) - Rough Stone (38393 m^3) & Gravel (4274 m^3).
Operational Hours Per Year	2400
Activity Rate, t/hr.	390.2414
Emission of dust, g/t.	0.20
Emission of dust, g /hr.	59.51436
Area of influence, m2	625
Uncontrolled emission rate g/s/m2	0.000135624
Controlled emission rate, PM10 g/s/m2	0.0001356242
Controlled emission rate, PM2.5 g/s/m2	0.000904161

(b) Line Source – Transport of Rough Stone & Gravel from Pit to Boundary (Cluster)

Quantity, m^3/annum	**Existing Quarries:** • Tmt.S.Sumathi (1.29.5 Ha) - Rough Stone (19245 m^3) & Gravel quarry (6415 m^3). • Thiru.C.Venkatesan (1.10.0 Ha) - Rough Stone (90,855 m^3) & Gravel quarry (3,990 m^3). • Thiru.D.Sivakumar (0.33.5 Ha) - Rough Stone (2520 m^3) & Gravel (1008 m^3). • Thiru.T.Balachandar (0.44.0 Ha) - Rough Stone (3525 m^3) & Gravel (1026 m^3). **Present Proposed Quarries** • Thiru.K.Munusamy (2.15.5 Ha) - Rough Stone (41055 m^3) & Gravel (3745 m^3). • Thiru.R.Natarajan (1.05.5 Ha) - Rough Stone (14852 m^3) & Gravel (1550 m^3). • Thiru.R.Natarajan (2.31.5 Ha) - Rough Stone (208760 m^3) & Gravel (34184 m^3). • Tmt.Kasthuri (1.64.0 Ha) - Rough Stone (38393 m^3) & Gravel (4274 m^3).
Operational Hours Per Year	2400
Capacity of each Dumper (T)	10
Total No. of Tippers/ year	18619
Lead length/trip, Km	0.9
Total VKT/Year	20913
Emission Kg/VKT	0.25
Total emission Kg/Year	248614
Uncontrolled emission rate g/s/m	8137454
Controlled emission rate, PM10 g/s/m	0. 8137454
Controlled emission rate, PM2.5 g/s/m	0.2260404

Note: *Emission factor computed based on wind speed of 2m/s, and moisture content of 10 %. + Emission factor computed based on silt content of 10 % and moisture content of 10 %.

The overall scenario with predicted concentrations over the maximum baseline concentrations is shown in the following table along with isopleths **Figures - 7.1 & 7.2**.

(c) Predicted Incremental Concentration (As a Cluster):

The post project Cluster Concentrations of PM10, PM2.5, (GLC) (base line + incremental) after adopting necessary control measures is given in **Table- 7.3 & 7.4**.

Table - 7.3 Cluster Concentrations of PM2.5 after Project Implementation

SL. No	Location	Background Concentration	Predicted incremental Concentration	Post Project Concentration	Statutory Limits in µg/m³
1	Within Mine Lease area	27.3	0.67	27.97	60
2	Thangal	24.0	0.60	24.6	
3	Pichanatham	23.4	0.52	23.92	
4	Karadikudi	25.4	0.37	25.77	
5	Odiyathur	23.95	0.30	24.25	
6	Anaicut	22.5	0.22	22.72	

Table - 7.4 Cluster Concentrations of PM10 after Project Implementation

SL. No	Location	Background Concentration	Predicted incremental Concentration	Post Project Concentration	Statutory Limits in µg/m³
1	Within Mine Lease area	58.65	5.36	64.01	100
2	Thangal	51.15	4.69	55.84	
3	Pichanatham	46.8	4.02	50.82	
4	Karadikudi	51.9	2.68	54.58	
5	Odiyathur	52.25	2.01	54.26	
6	Anaicut	49.8	0.67	50.47	

The above cluster report seems that, even in the worst-case scenario, the resultant added cluster concentrations with baseline figures show that the values of ambient air quality for for PM_{10} are in the range of 50.47 µg/m³ to 64.01 µg/m³ and for $PM_{2.5}$ are in the range of 22.72 µg/m³ to 27.97 µg/m³ which are within the statutory limits in each case.

FIGURE - 7.1 ISOPLETH OF GLC PREDICTION –CUMULATIVE FOR $PM_{2.5}$

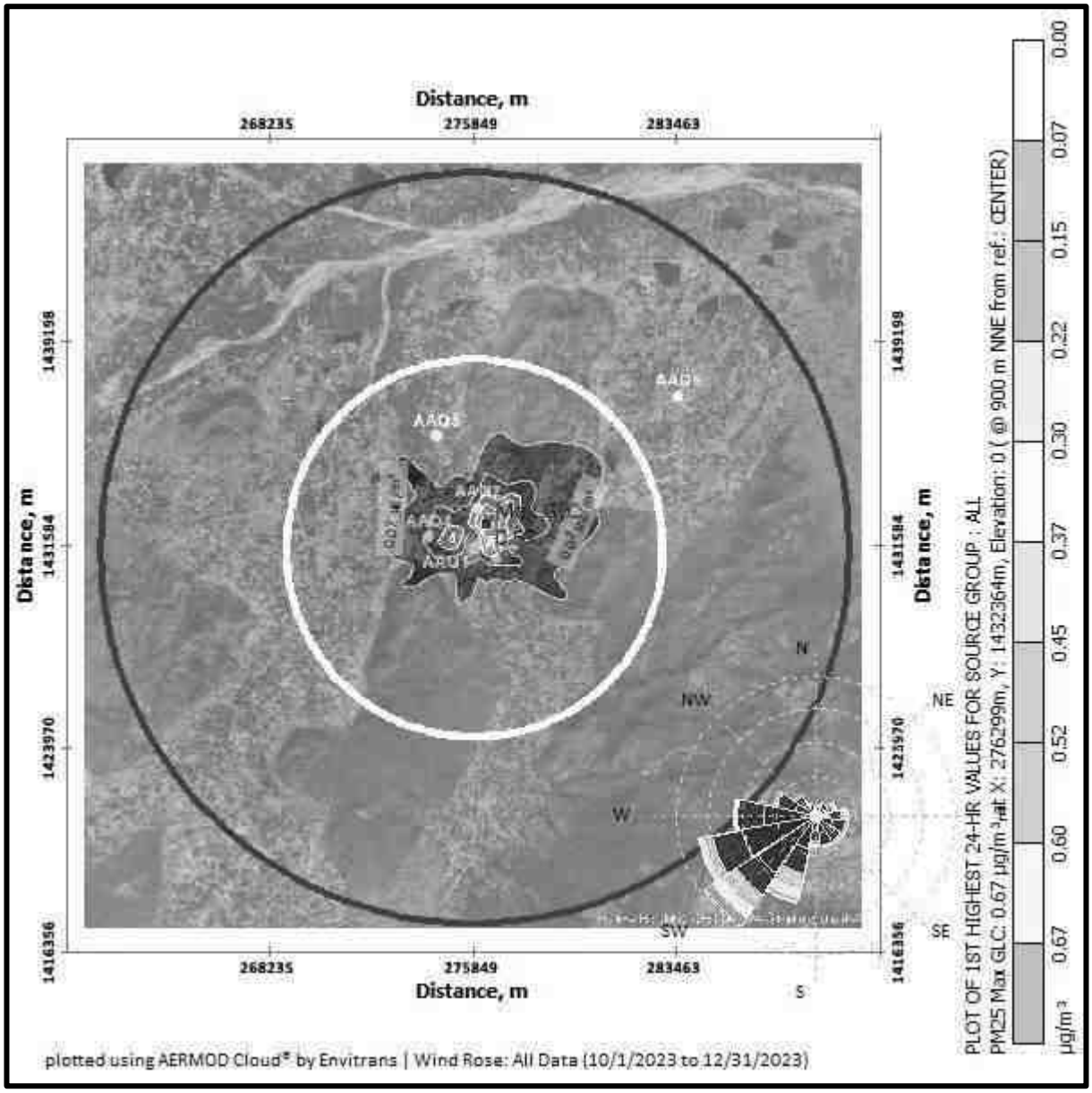
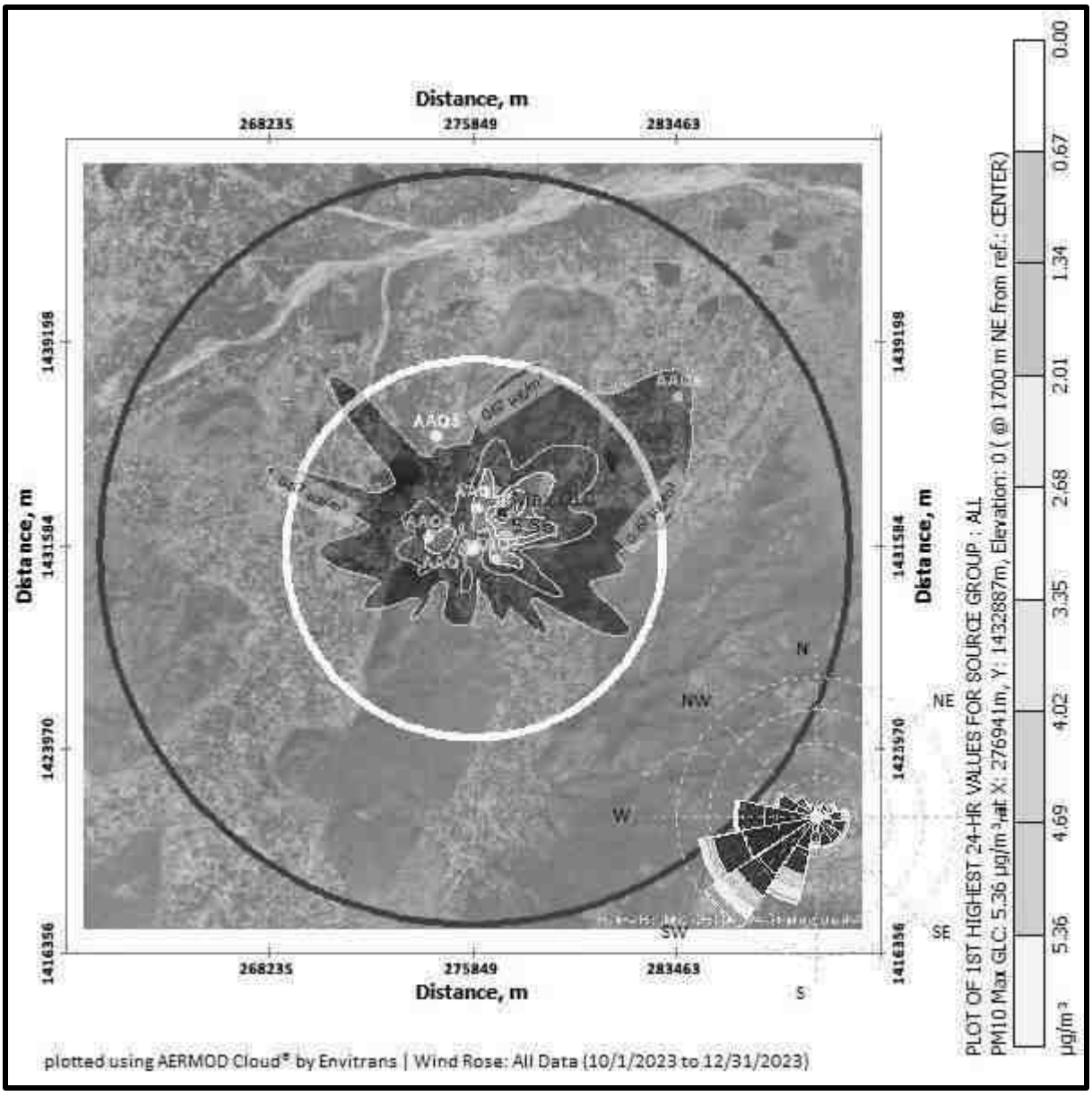


FIGURE - 7.2 ISOPLETH OF GLC PREDICTION –CUMULATIVE FOR PM_{10}



7.3.2 CUMULATIVE IMPACT ON SOCIO-ECONOMIC ENVIRONMENT

The mining operations in mines within 500m radius will provide direct and indirect employment opportunity for scores of people through allied opportunities in logistics, contract workers, trading, repairing works etc. Towards development of the surrounding area, under Corporate Environmental Responsibility activities 2% of project cost has been earmarked for each mines separately. Various mitigative measures suggested in this report will be properly implemented to ensure that no adverse impact is felt on the socio economic and ecological front in the area.

7.3.3 CUMULATIVE IMPACT ON TRAFFIC

The mined-out minerals will be transported by means of trucks to the consumers like crusher units for producing stone aggregates of different sizes or construction of roads, bridges, buildings and other buyers etc. The cumulative impact on traffic due to transportation of minerals from these three leases are provided below:

Table - 7. 6: IMPACT ON TRAFFIC

Description	Rough Stone and Gravel Production Per day in tons	No. of Lorry Load per day
P1	4858	483
Cluster	18619	1861
Total		**2344**

The proposed projects will bring 2344 trips per day. The existing road can absorb this additional traffic due to this project. Various measures like proper maintenance of road, covering of the loaded truck with tarpaulin, water sprinkling will be carried out to ensure no adverse impact on the logistical front.

7.4 HYDROGEOLOGICAL STUDY

A detailed hydrogeological study has been done and elaborated in Chapter 3. From this proposed project, Periya Eri is located at a distance of 2.00 km in Northwest direction, Agaram Aru is located at a distance of 4.30 km in Northwest direction, Palar River is located at a distance of 7.44 km in Northern direction and Bahuda River is located at a distance of 7.5 km in Northern direction respectively. Since these water

bodies are located outside the lease area and there is no discharge of effluent or any untreated water from the mines will be made into these water bodies, there is no major impact. The project proponent will restrict the mining operation only within the lease and no other work will be carried out outside the mining lease.

On the other hand, the ultimate depth of quarrying is proposed with maximum depth of 32m (17m AGL + 15m BGL) and hence mining operation will not intersect the ground water table as water table is found at a depth of 50m in summer and 47m in rainy seasons.

7.5 SLOPE STABILITY STUDY

The proposed quarry is a very small quarry and the production is also less. Opencast-Mechanized mining with a bench height of 5m and bench width of 5m and 80° Slope is proposed. The ultimate depth of mining is proposed as 32m (17m AGL and 15m BGL). Also, there is no overburden since the entire mined out material will be utilized. As far as technical factors are concerned, the following precautionary measures will be adopted:

- Strict adherence to DGMS norms
- Frequent inspection by Mines-in-charge/Mines Manager
- Bench height, width, slope will be as per DGMS norms

7.6 DISASTER MANAGEMENT PLAN

Proper preventive mechanism exists already in the mines.

- Precautionary measures are well explained to all staff by the mines in-charge.
- PPE necessary for all staff are available in the quarry. No person is allowed to enter inside without PPE. Avoiding quarrying during unfavorable environmental conditions.
- Carrying out safe blasting by following DGMS norms
- Safety equipment like fire extinguisher, first aid kit, etc., are present in the mine.
- Proper maintenance of machinery used for mining
- In case of any emergency, the contact numbers of mines in-charge, mines manager, Management contact are available in the mines office.

7.7 MINE CLOSURE PLAN

The quarrying operation is proposed up to a depth of 32m (17m Above Ground Level and 15m Below Ground level) which will be achieved in 5 years. The ultimate pit dimension will be 195m (L) x 77m (W) x 32m (D) – 17 m AGL + 15 m BGL. After completion of quarrying operation, the mined-out pit will be left as rain water harvesting pond. The quarry will be properly fenced with barbed wire.

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CHAPTER - 8

PROJECT BENEFITS

8.1 PROJECT BENEFITS

Project benefits are attributed in various ways as under:

- Environment Benefits
- Employment Potential: Skilled, Semi-skilled & Un-skilled
- Economic Benefits
- Social Benefits

8.2 IMPROVEMENTS IN THE PHYSICAL INFRASTRUCTURE

The project area is located on Patta land, thereby causing no impact on the loss of agriculture or forest land. The project will create employment opportunities in the area. There will be no adverse effect of mining on the socioeconomic status of the people; rather, mining activities will improve their standard of living. The mining activity creates employment opportunities for the local people, and this definitely raises their economic status. Apart from the overall beneficial impact of the project on the local people of the region, it is felt necessary to augment facilities in the fields of education, health, and social awareness, including concern for the environment and ecosystem.

8.3 IMPROVEMENTS IN THE SOCIAL INFRASTRUCTURE

The proposed project will help in improving the socio-economic status of the near-by villages by generating direct or indirect employment opportunities. Substantial amount of indirect revenue will be generated by transportation activities along with employment e.g. labour, helper etc.

As per MOEF&CC Notification CER cost is arrived for an amount of INR 5,00,000/- Lakhs @ 2% of the project cost, it will be utilized as per the CER letter received from the competent authority, enclosed as **Annexure - 12**. Based on the demand of the people during public hearing, further funds will be allocated, if necessary.

8.4 ECONOMIC BENEFITS:

The execution of proposed mine will boost the economy of the area by creating direct & indirect jobs for locals. There will be a positive cumulative impact of the project on the economy.

8.5 EMPLOYMENT POTENTIAL: SKILLED, SEMI-SKILLED & UN-SKILLED

This project provides employment to 24 people directly & indirectly. Local people will be hired for unskilled labour. The mine management will recruit semi-skilled & unskilled eligible workers from the nearby villages depending upon requirement in the mines and the eligibility, qualification and experience of local persons.

The overall effect will result in higher standard of living viz. better education, improved health and sanitation facilities, housing and acquisition of consumer durables. Housing, transport, medical, educational and other civic amenities will get improved in the future. This is envisaged as a major positive benefit.

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CHAPTER - 9

ENVIRONMENTAL COST BENEFIT ANALYSIS

As per EIA Notification dated 14th Sept., 2006, as amended from time to time, 'Environmental Cost Benefit Analysis' is applicable only if the same is recommended at the Scoping stage.

As per the ToR points issued by SEIAA-TN vide ToR Lr.No.SEIAA-TN/F.No.9971/SEAC/ToR-1495/2023, Dated 22.06.2023 for the proposed project, the 'Environmental Cost Benefit Analysis' is not prescribed.

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CHAPTER - 10

ENVIRONMENTAL MANAGEMENT PLAN

10.1 DESCRIPTION OF THE ADMINISTRATIVE ASPECTS OF ENSURING THAT MITIGATIVE MEASURES ARE IMPLEMENTED AND THEIR EFFECTIVENESS MONITORED AFTER APPROVAL OF THE EIA.

10.1.1 OBJECTIVES

The Environmental Management Plan is developed to ensure that a project is implemented in an environmentally sustainable manner, where all contractors and subcontractors, including consultants, understand the potential environmental risks arising from the project and take appropriate actions to minimize those risks. EMP also ensures that the project implementation is carried out in accordance with the planned design and by taking appropriate mitigation measures to reduce adverse environmental impacts during the project's life cycle. The impacts due to this mining project are detailed in Chapter - 4 and Mitigation measures at the source level and an overall Management Plan at the site level are elaborated in this chapter.

10.1.2 BASIC OF EMP

The Environmental Management Plan for the proposed project activities is formulated taking into considerations the following key environmental issues.

- Project activities
- Studies on Environmental Impact Assessment
- Air & water pollution control
- Working zone environment improvement
- Occupational hazards & safety
- Environmental monitoring facilities
- Environmental management costs

EMP covers all phases of the project considering the impacts with mitigation measures and monitoring programme. The plan outlines the measures that will be undertaken to ensure compliance with environmental legislations and to minimize adverse impact. Details of EMP measures for implementation in the mine are given below.

Table - 10.1 Environmental Management Plan	
Environmental Parameter	**Mitigation Measures**
Air	Wet drilling to suppress the dust emission from drill machine
	Regular water sprinkling on haulage road through fixed water sprinkler.
	0.5 KLD of water will be used for dust suppression.
	Avoiding blasting during high wind period, night times and temperature inversion periods.
	Regular grading of haul road to clear accumulation of loose material.
	It will be ensured that vehicles are properly maintained to comply with exhaust emission requirements
	Maintenance as per operator manual of the equipment and machinery in the mines to minimizing air pollution
	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.
	Afforestation for control of dust.
Surface water	• There is no seasonal or perennial Odai within the M.L area. From the proposed site, Periya Eri is located at a distance of 2.00 km in Northwest direction, Agaram Aru is located at a distance of 4.30 km in Northwest direction, Palar River is located at a distance of 7.44 km in Northern direction and Bahuda River is located at a distance of 7.50 km in Northern direction respectively. Since these water bodies are located outside the lease area, there is no major impact. • Surface runoff management structures like garland drain of required length which is connected to a settling pond will be constructed around the quarry to collect the rain water. • Monthly or after rainfall, inspection will done to ensure performance of water management structures and systems. • There is no discharge of any effluent into nearby water bodies.
Ground Water	The quarrying operation is proposed upto a depth of 32m (17m Above Ground Level and 15m Below Ground level for the period of five years), Water table is found at a depth of 50m, and hence the project will not intersect the Ground water table during entire quarry period.
Water Consumption and Wastewater generation	Water required for this project will be sourced from vendors.
	Domestic wastewater generation of 0.8 KLD will be treated in septic tank with soak pit.
	Conduct ground water and surface water monitoring for parameters specified by CPCB

Noise	The workers employed are provided with protection equipment, earmuffs and ear-plugs for the protection from high noise level generated at the mine site wherever required.
	Noise levels are controlled by using optimum explosive charge, proper delay detonators and proper stemming to prevent blow out of holes.
	Development of thick greenbelt all along the safety Zone (7.5 =m) of the project area to attenuate the noise and the same will be maintained.
	Preventive maintenance of mining machinery and replacement of worn-out accessories to control noise generation.
	Annual ambient noise level monitoring are 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 noise control measures. Additional noise control measures will be adopted if required as per the observations during monitoring.
Ground Vibration and Fly Rock Control	Controlled blasting using delay detonators will be carried out to maintain the PPV value well within the prescribed standards of DGMS.
	Drilling and blasting will be carried under the supervision of qualified persons.
	Will be Ensured that blast holes are adequately stemmed for the depth of the hole and stemmed with suitable angular material.
	To be Undertake noise or vibration monitoring.
Land Environment	At conceptual stage, the mining pits will be converted into Rain Water Harvesting pit. Remaining area will be converted into greenbelt area.
	No external dumping i.e., outside the project area. The entire material will be sold.
	Garland drains with catch pits / settlement traps to be provided all around the project area to prevent run off affecting the surrounding lands.
	The periphery of Project area will be planted with thick plantation to arrest the fugitive dust, which will also act as acoustic barrier.
	Frequent Soil and ground water testing as per Environmental Monitoring Plan.
Top Soil / Overburden	There is no overburden anticipated during the quarrying operation.
Biological Environment	During mining, thick plantation will be carried out on the mentioned safety zone areas.
	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.
	Regular review on Green belt development programme.
	Year wise greenbelt development plan mentioned in Chapter - 3 will be monitored.

10.1.3 ADMINISTRATION AND TECHNICAL SETUP

Since this is a very small quarry, the mines in-charge will take care of all environment related aspects. He will ensure effective implementation of environment management plan and to ensure compliance of environmental statutory guidelines through Mine Management Level. The action plan consists of monitoring of following environmental components.

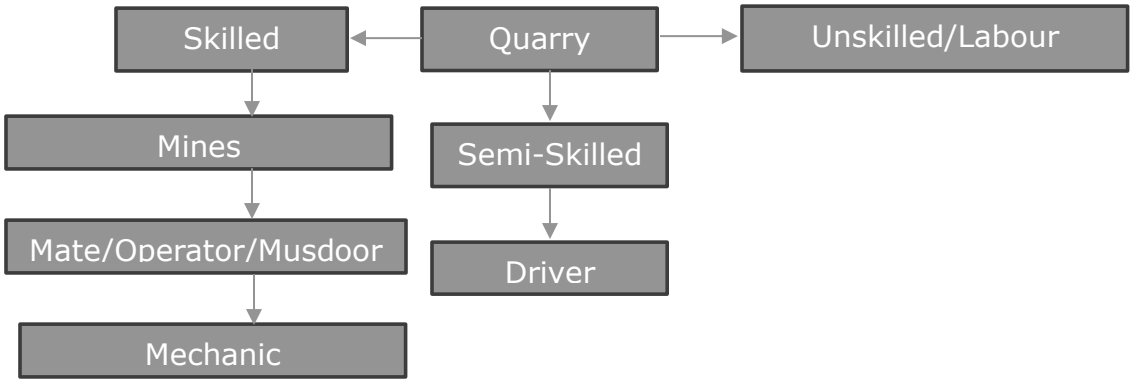
- Monitoring of the water/ waste water quality, air quality and solid waste generated.
- Analysis of the water and air samples collected through external laboratory.
- Implementation and monitoring of the pollution control and protective measures/ devices which shall include financial estimation, ordering, 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.

10.1.4 ENVIRONMENTAL POLICY

- The Project Proponent has stipulated a well-defined Environmental policy by which the lessee is committed to conducting business with a strong environmental conscience towards the community, customers, and employees. The Environment policy is given as Figure below.
- The Environment policy of "Rough Stone & Gravel Quarry of Thiru.R.Natarajan" is that the rules and commitment are driven towards conservation of the environment.
- The project is committed to the identification of possible impacts and will take the necessary management steps to mitigate the impacts.

- Environment performance will be regularly monitored and reported for continual improvement of our environment and health performance.

FIGURE - 10.1 ORGANIZATION CHART



1	Skilled	Mines Manager	1 No
		Foreman/Mate	1 Nos
		Operator	8 Nos
		Mechanic	1 No
2	Semi-Skilled	Diver	3 Nos
3	Un-skilled	Labours	10 Nos
		Total	**24 Nos**

10.1.5 OCCUPATIONAL SAFETY & HEALTH MANAGEMENT

Occupational safety and health are very closely related to productivity and a good employer-employee relationship. The main factors affecting occupational health in quarries are fugitive dust and noise. Safety of employees during quarrying operations and maintenance of mining equipment will be taken care of as per the Mines Act 1952 and Rule 29 of the Mines Rules 1955. To avoid any adverse effect on the health of workers due to dust, noise, and vibration, sufficient measures have been provided. The health status of workers in the mine will be regularly monitored under an occupational surveillance programme. Under this programme, all employees are subjected to a detailed medical examination at the time of employment. Before the induction of employees, a pre-medical checkup is done. In addition, a periodical medical checkup will be done annually for all employees.

10.1.6 COST OF ENVIRONMENTAL CONTROL MEASURES

The effective implementation of EMP is to reduce pollution load and comply the regulatory requirement but also increases the productivity and improve marketability of the product. The revised capital and recurring cost of EMP has been given in below table.

Table – 10.2 Environmental Management Plan Budget

Sl. No	Budget planned for	Capital cost (INR)	Recurring Cost /Annum (INR)
Air Environment			
1	Haul Road Maintenance	0.23	0.23
2	Water Sprinkler Arrangement	8.00	0.75
3	AAQ Monitoring	0.00	0.50
4	Control Blasting (Muffle blasting)	0.00	0.08
5	Wet Drilling	1.50	0.15
6	No overloading of trucks/tippers/tractors	0.00	0.05
7	Stone carrying trucks will be covered by tarpaulin	0.00	0.14
8	Enforcing speed limits of 20 km/hr within ML area	0.15	0.00
9	Regular monitoring of exhaust fumes as per RTO norms	0.00	0.05
10	Regular sweeping and maintenance of approach roads for at least about 200 m from ML Area	0.00	5.56
11	Installing wheel wash system near gate of quarry	0.50	0.20
Sub-Total (A)		**10.38**	**7.71**
Noise Environment			
12	Provision for Portable blaster shed	0.50	0.04
13	NONEL Blasting will be practiced to control Ground vibration and fly rocks	0.00	5.33
Sub-Total (B)		**0.50**	**5.37**
Water Environment			
14	Provision for garland drain @ Rs. 10,000/- per Hectare with maintenance of Rs. 5,000/- per annum	0.23	0.05
15	Installation of Bio toilet (Portable)	2.00	0.20
16	Sump Maintenance	0.00	0.20
17	Dewatering Cost	0.00	2.00
Sub-Total (C)		**2.23**	**2.45**
Implementation of EC, Mining Plan & DGMS Condition			
18	Waste management (Spent Oil, Grease etc.,)	0.35	0.23
19	Environmental Parameters Display Board	0.20	0.02
20	Issue of PPE's	0.96	0.24
21	IME & PME Checkup	0.00	0.24
22	First Aid facility Provision	0.00	0.09
23	Signage & boards for safety precautions	0.10	0.02

24	Barbed Wire Fencing to quarry area	4.63	0.10
25	Parking yard Management	1.16	0.10
26	Installation of CCTV cameras in the mines and mine entrance	0.30	0.05
27	Implementation as per Mining Plan and ensure safe quarry working (Statutory)	0.00	10.80
28	Slope Stability	5.00	0.50
Sub-Total (D)		**12.70**	**12.39**
GREEN BELT			
29	Plantation inside ML area (240 Nos.)	0.48	0.07
30	Plantation outside ML area (920 Nos.)	2.76	0.28
Sub-Total (E)		**3.24**	**0.35**
Additional Key EMP Expenses			
31	Constructing Rainwater Harvesting Structure	5.00	0.10
32	Environmental Awareness Programme	0.50	0.00
33	Mine Closure Plan	5.00	0.00
34	District Green Fund	20.70	0.00
Sub-Total (F)		**31.20**	**0.10**
Grant Total (A+B+C+D+E+F)		**60.25**	**28.37**

The revised total EMP Cost is 217.01 Lakhs for a period of five years have been proposed. i.e., Capital cost of Rs.60.25 Lakhs + Recurring cost of Rs.156.76 lakhs (For Five years).

10.1.7 CONCLUSION

Various aspects of mining activities were considered, and related impacts were evaluated. Considering all the possible ways to mitigate the Environmental concerns, an Environmental Management Plan was prepared and INR 217.01 Lakhs has been allocated for the same. The EMP is dynamic, flexible, and subjected to periodic review. For projects where major environmental impacts are associated, EMP will be under regular review. Thus, the proper steps will be taken to accomplish all the goals mentioned in the EMP, and the project will have a positive impact on the study area.

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CHAPTER - 11

SUMMARY & CONCLUSION

11.1 OVER ALL JUSTIFICATION FOR IMPLEMENTATION OF THE PROJECT

11.1.1 INTRODUCTION

Thiru.R.Natarajan S/o. Rangasamy, Lessee, has obtained Precise Area Communication Letter from Assistant Director, Department of Geology and Mining, Vellore to quarry out 2,08,760 m^3 of Rough Stone and 34,184 m^3 of Gravel over an extent of 2.31.50 Ha., located at the Survey No. 253/7, 259/5, 259/2 and 259/4 of Karadikudi Village, Anaicut Taluk, Vellore District, Tamil Nadu State.

As per EIA notification, 2006 and its subsequent amendments the proposed "Rough Stone and Gravel Quarry" of Thiru.R.Natarajan S/o. Rangasamy mines cluster falls under Schedule 1(a) of EIA Notification and its subsequent amendments the project comes under Category B1. The ToR for preparation of EIA/EMP report of the project was approved vide ToR Lr.No.SEIAA-TN/F.No.9971/SEAC/ToR-1495/2023, Dated 22.06.2023. This report has been prepared in line with the approved TOR for production of maximum excavation of 2,08,760 m^3 of Rough Stone and 34,184 m^3 of Gravel.

The lessee, Thiru.R.Natarajan S/o. Rangasamy is an individual with sound experience in the identification, quarrying and marketing of Rough Stone and Gravel. The proposed land is patta land registered in the name of applicant vide patta no.757 & 943, please refer **Annexure - 5**.

Sl. No.	Description	Status/Remarks
1.	Sector	Non-coal mining
2.	Category of the project	B1
3.	Proposed mineral	Rough Stone & Gravel quarry
4.	Type of Lease	New Project
5.	Extent of the lease	2.31.50 Ha
6.	Proposed depth of mining	32m BGL (17m AGL + 15m BGL)
7.	Method of mining	Opencast Mechanized
8.	Proposed lease period	5 Years

9.	Proposed Environmental Clearance	5 Years
10.	Proposed production quantity for five years	Rough Stone: 2,08,760 m^3 Gravel: 34,184 m^3

11.1.2 LOCATION

This project site is located in Karadikudi Village, Anaicut Taluk, Vellore District, Tamil Nadu State with Latitude 12°50’40.55"N to 12°50’49.50"N and Longitude: 78°56’07.22"E to 78°56’14.85"E with Survey of India Topo Sheet No. 57-L/13. To conduct the study, the proposed mine lease area (core zone) and an impact zone of 10 km radius (called buffer zone) around the proposed mine site were considered. The EIA report is based on three months baseline data Post Monsoon Season (October 2023 to December 2023).

11.1.3 GEOLOGY

The rock type noticed in the area for lease is Charnockite which contains mostly Quartz and Feldspar with some ferromagnesian minerals. The Charnockite is part of peninsular Gneisses, a high-grade metamorphic rock. The strike of the Charnockite formation is with vertical dipping.

11.1.4 PROJECT DESCRIPTION

This is a proposed Rough Stone and Gravel quarry by Opencast Mechanized mining method with drilling and blasting. The quarrying is restricted up to a depth of 32m (17m AGL and 15m BGL). The geological reserves are estimated to be 5,35,500m^3 of Rough Stone and 50,134m^3 of Gravel. The mineable reserve calculated by deducting 7.5m safety distance and bench loss. The mineable reserves estimated to be 2,08,760m^3 of Rough Stone and 34,184m^3 of Gravel which will be recovered at the rate of 100% recovery.

It is proposed to quarry out rough stone and Gravel with 5m bench height, 5m width with 80° slope using conventional Opencast Mechanized method. The quarry operation involves shallow jack hammer drilling, slurry blasting, excavation, Loading and transportation of Rough Stone and Gravel. There is no overburden anticipated

during entire Rough stone and Gravel quarrying operation. The Salient features of the project are given in below table.

S.No.	Type of Detail	Description
1	Sector	1(a) Non coal mining
2	Fresh/Existing project	New Project
3	Category	B1
4	Nature of mineral	Minor Mineral
5	Life of the mine	5 years
6	Production Quantity for five years	Rough Stone - 2,08,760 m^3 Gravel - 34,184 m^3
7	Waste generation and management	Nil
8	Bench height and width	Proposed bench height & width is 5.0m respectively and number of proposed benches is 6 Nos (1+5).
9	Ultimate pit depth	32m (17m AGL + 15m BGL)
10	End use	The excavated Rough Stone and Gravel is used for construction industries for Government & Public sector projects besides catering domestic housing and infrastructure projects in and around the district.

11.1.5 PROJECT REQUIREMENTS

The requirements of the project is given below.

S.No.	Nature of requirement	Description
1	Water requirement	Total water requirement of 2.0 KLD which will be procured from the outside agencies. 1.0 KLD for drinking & domestic requirement, 0.5 KLD for green belt development and 0.5 KLD for dust suppression.
2	Power requirement	No electricity is needed for mining operations, for office demands, it will be met from the state grid.
3	Manpower requirement	Permanent employees – 11, temporary employees – 13.

4	Financial requirement	The total revised project cost will be INR 290.4 lakhs including Operational cost, Fixed Asset cost and EMP cost.
5	Funds for Socio economic development	INR 5.0 lakhs is allocated (@ 2% of the project cost). In addition, any demand raised by people during public hearing will also be met.

11.1.6 DESCRIPTION OF LEASE AREA

The baseline data collection for meteorology, air, water, noise and soil environments have been carried out during Post Monsoon Season (October 2023 to December 2023). Air, water, noise and soil samples are collected and analyzed through NABL accredited lab. The features in the study area are given below.

<table>
<tr><th>S.No.</th><th>Areas</th><th>Distance from project site</th></tr>
<tr><td>1</td><td>Areas protected under international conventions, national or local legislation for their ecological, landscape, cultural or other related value</td><td>Nil within 15km radius</td></tr>
<tr><td>2</td><td colspan="2">Areas which are important or sensitive for ecological reasons</td></tr>
<tr><td>A</td><td>Wetlands, water courses or other water bodies,</td><td>
<table>
<tr><th>Water bodies</th><th>Distance</th><th>Direction</th></tr>
<tr><td>Odiyathur lake</td><td>1.02 kms</td><td>N</td></tr>
<tr><td>Chinna Eri</td><td>2.65 kms</td><td>W</td></tr>
<tr><td>Periya Eri</td><td>2.0 kms</td><td>NW</td></tr>
<tr><td>Narayanaburam lake</td><td>3.90km</td><td>NE</td></tr>
<tr><td>Nallurpet lake</td><td>13.53km</td><td>NW</td></tr>
<tr><td>Mel Kavanur lake</td><td>10.26km</td><td>NE</td></tr>
<tr><td>Vasanthanadai lake</td><td>8.20km</td><td>NE</td></tr>
<tr><td>Sathiyamangalam Eri</td><td>10.80 km</td><td>NE</td></tr>
<tr><td>Poigai pond</td><td>14.35km</td><td>NE</td></tr>
<tr><td>Pallikonda Lake</td><td>5.73km</td><td>N</td></tr>
<tr><td>Agaram Aru</td><td>4.30km</td><td>NW</td></tr>
<tr><td>Palar</td><td>7.44km</td><td>N</td></tr>
<tr><td>Bahuda River</td><td>7.50km</td><td>N</td></tr>
</table>
</td></tr>
<tr><td>B</td><td>Coastal zone, biospheres</td><td>Nil within 10km radius</td></tr>
<tr><td>C</td><td>Mountains, forests, Sanctuary</td><td>
<table>
<tr><th>Forest</th><th>Distance</th><th>Direction</th></tr>
<tr><td>Pallikonda RF</td><td>2.23km</td><td>N</td></tr>
<tr><td>Nallimalai RF</td><td>2.47km</td><td>E</td></tr>
</table>
</td></tr>
</table>

		Paravamalai RF	2.37km	S
		Sanankupppam RF	6.37km	SW
		Arasampattu RF	5.41km	SE
		Pudukuppam RF	10.41km	S
		Puthur RF	14.66km	S
		Karuthamalai RF	11.92km	SW
		Thellai RF	12.55km	SE
		Athiyur RF	12.31km	E
		Kailasagira RF	13.49km	E
		Koundinya Wildlife Sanctuary	19.60km	NW
3	Areas used by protected, important or sensitive species of flora or fauna for breeding, nesting, foraging, resting, overwintering, migration	Nil within 15km radius		
4	Inland, coastal, marine or underground waters	Nil within 15km radius		
5	State, National boundaries	Nil within 15km radius		
6	Routes or facilities used by the public for access to recreation or other tourist, pilgrim areas	Nil within 15km radius		
7	Defense installations	Nil within 15km radius		
8	Densely populated or built-up area	Odiyathur (2.26 Km -N)		
9	Areas occupied by sensitive man-made land uses (hospitals, schools, places of worship, community facilities)	Odiyathur (2.26 Km -N)		
10	Areas containing important, high quality or scarce resources (ground water resources, surface resources, forestry, agriculture, fisheries, tourism, minerals)	Nil		
11	Areas already subjected to pollution or environmental damage. (those where existing legal environmental standards are exceeded)	Nil		

12	Areas susceptible to natural hazard which could cause the project to present environmental problems (earth quakes, subsidence, landslides, erosion, flooding or extreme or adverse climatic conditions) similar effects	No. The area is not prone to earthquakes, floods, etc.

11.2 DESCRIPTION OF THE ENVIRONMENT

11.2.1 AIR ENVIRONMENT

The air monitoring have been carried out in 6 locations and details of monitoring locations are given below:

Details of Ambient Air Quality Monitoring Locations				
S. No.	**Station Code**	**Locations**	**Distance & Direction**	**Coordinates**
1	AAQ1	Within Mine Lease area	Core Zone	12°50'40.55"N 78°56'09.12"E
2	AAQ2	Thangal	0.64 km, N	12°51'04.18"N 78°56'17.48"E
3	AAQ3	Pichanatham	1.38 km, SE	12°50'2.02"N 78°56'36.06"E
4	AAQ4	Karadikudi	1.02 km, W	12°50'39.03"N 78°55'31.26"E
5	AAQ5	Odiyathur	2.65 km, NW	12°52'7.05"N 78°55'39.56"E
6	AAQ6	Anaicut	5.92 km, NE	12°52'36.81"N 78°59'14.06"E

The concentrations of various air pollutants at the 6 locations are given below. For all the components in the table, the unit are in $\mu g/m^3$.

Results of Air Sampling Analysis in 6 locations			
Station ID	**Min**	**Max**	**Avg.**
Particulate matter PM_{10} ($\mu g/m^3$)			
AAQ-1	52.6	64.7	58.65
AAQ-2	46.1	56.2	51.15
AAQ-3	41.1	52.5	46.8
AAQ-4	44.6	59.2	51.9
AAQ-5	45.2	59.3	52.25
AAQ-6	44.4	55.2	49.8
CPCB NAAQS 2009 for PM_{10} - 100 $\mu g/m^3$			
Particulate matter $PM_{2.5}$ ($\mu g/m^3$)			
AAQ-1	24.1	30.5	27.3
AAQ-2	20.9	27.1	24
AAQ-3	18.7	28.1	23.4
AAQ-4	21.1	29.7	25.4
AAQ-5	20.8	27.1	23.95
AAQ-6	20.2	24.8	22.5
CPCB NAAQS 2009 for $PM_{2.5}$ - 60 $\mu g/m^3$			
Sulphur Di-oxide as SO_2 ($\mu g/m^3$)			
AAQ-1	4.1	6.4	5.25
AAQ-2	4.1	6.8	5.45
AAQ-3	4.0	6.4	5.2
AAQ-4	4.2	8.8	6.5
AAQ-5	4.4	7.8	6.1
AAQ-6	4.1	6.5	5.3
CPCB NAAQS 2009 for SO_2 – 80 $\mu g/m^3$			
Oxide of Nitrogen as NO_2 ($\mu g/m^3$)			
AAQ-1	8.7	11.2	9.95
AAQ-2	7.3	9.1	8.2
AAQ-3	6.2	8.4	7.3
AAQ-4	8.2	12.5	10.35
AAQ-5	7.7	10.2	8.95
AAQ-6	6.4	9.5	7.95
CPCB NAAQS 2009 for NO_2 – 80 $\mu g/m^3$			

All the values of pollutant concentrations were found to be within the NAAQs Standards.

11.2.2 WATER ENVIRONMENT

Three surface water samples and six ground water samples were collected from the study area and were analyzed and given in below table.

Results of Surface Water Analysis						
Sr.No	**Parameter**	**Unit**	**SW1**	**SW2**	**SW3**	**Surface water standards (IS: 2296 –Class A)**
1	pH	-	8.01	8.08	7.41	6.5-8.5
2	EC	µs/cm	1042	1251	511.2	-
3	Turbidity	NTU	<1.0	<1.0	110	1
4	Temperature	-	30.5	31	30.5	-
5	Odour	mg/l	Agreeable	Agreeable	Agreeable	500
6	Total Hardness	mg/l	312	320	190	-
7	Calcium Hardness	mg/l	171	175	130	
8	Magnesium Hardness	mg/l	141	145	59.5	-
9	Calcium	mg/l	68.4	69.9	52.1	300
10	Magnesium	mg/l	33.9	34.8	14.3	-
11	Total Alkalnity	mg/l	372	396	141	-
12	Chloride	mg/l	163	192	51.2	-
13	Sulphate	mg/l	54.7	109	65.8	400
14	Mangenese	mg/l	BDL(DL-0.05)	BDL(DL-0.05)	BDL(DL-0.05)	0.5
15	Iron	mg/l	0.03	0.06	0.08	1.0
16	Nitrate	mg/l	2.35	1.25	2.68	20
17	Fluoride	mg/l	0.662162162	0.706306306	0.4875	1.5
18	TDS	mg/l	630	755	326	500
19	FRC	mg/l	BDL(DL-0.2)	BDL(DL-0.2)	BDL(DL-0.2)	250
20	TSS	mg/l	14.0	24.0	56.0	-
21	COD	mg/l	BDL(DL-4.0)	BDL(DL-4.0)	BDL(DL-4.0)	-
22	BOD	mg/l	BDL(DL-2.0)	BDL(DL-2.0)	BDL(DL-2.0)	-
23	DO	mg/l	6.5	6.2	5.9	-

Results of Ground Water sampling Analysis									
S. No	Parameter	GW1	GW2	GW3	GW4	GW5	GW6	Specification/Limit (As per IS:10500 2012)	
								Desirable	Permissible
1	pH	7.61	6.78	7.38	7.74	7.61	7.32	6.5 - 8.5	No Relaxation
2	EC	820.2	1176	1398	2068	1336	2276	1	5
3	Turbidity	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	Agreeable	Agreeable
4	Odour	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable
5	Total hardness	242	376	413	446	424	577	1	15
6	Calcium hardness	156	298	316	260	242	376	-	-
7	Magnesium hardness	85.6	78.1	96.7	186	182	201	-	-
8	Calcium	62.5	119	126	104	96.7	150	200	600
9	Magnesium	20.5	18.7	23.2	44.6	43.7	48.2	75	200
10	Total Alkalnity	212	341	318	396	412	498		
11	Chloride	143	222	256	315	158	483		
12	Sulphate	64.8	137	199	315	235	203	250	1000
13	Mangenese	BDL (DL-0.05)	BDL (DL-0.05)	BDL (DL-0.05)	BDL (DL-0.05)	BDL (DL-0.05)	BDL (DL-0.05)	30	100
14	Iron	0.06	0.06	0.12	0.03	0.00	0.04	45	No Relaxation
15	Nitrate	3.24	2.98	3.44	2.61	1.87	2.65	200	400
16	Fluoride	0.55	0.19	0.57	0.56	0.62	0.69	1	No Relaxation
17	TDS	495	730	854	1262	844	1370	0.1	0.3
18	FRC	BDL(DL-0.2)	BDL(DL-0.2)	BDL(DL-0.2)	BDL(DL-0.2)	BDL(DL-0.2)	BDL(DL-0.2)	Not Specified	Not Specified

All the values were found to be within permissible limits

11.2.3 NOISE ENVIRONMENT

Noise levels were measured in 6 locations and the results are given below.

Noise monitoring Results						
S. No	Location	Day equivalent (dB)	Night equivalent (dB)	Permissible noise level standards by CPCB		Zone
				Day time (dB)	Night time (dB)	
1	Within Mine Lease area	44.6	37.3	75	70	Industrial Zone
2	Thangal	46.9	37.7	55	45	Residential Zone
3	Pichanatham	45.8	38.6			
4	Karadikudi	44.8	37.1			
5	Odiyathur	48.3	38.3			
6	Anaicut	47.5	38.3			

All the values are found to be within CPCB norms.

11.2.4 SOIL ENVIRONMENT

Soil samples are collected from 3 locations and the results are given below.

Results of Soil Sample Analysis				
S.No	Parameter	S1	S2	S3
1	pH	8.21	7.52	7.94
2	EC	87.21	64.83	109.20
3	Dry matter	90.86	95.11	91.62
4	Water content	9.14	4.89	8.38
5	Organic matter	0.12	0.15	0.21
6	Soil texture	Silty Clay Loam	Silty Clay	Clay
7	Total soluble Sulphates %	BDL(DL-0.02)	BDL(DL-0.02)	BDL(DL-0.02)
8	Grain Size Distribution			
	Sand %	8.60	5.41	5.16
	Silt %	54.20	49.39	37.06
	Clay %	37.20	45.21	57.78
9	Nitrogen & nitrogenous compounds mg/kg	154	192	177
10	Phosphorus mg/kg	0.14	0.14	0.14
11	Sodium mg/kg	1015	825	793
12	Potassium mg/kg	515	339	384
13	Water holding capacity	4.2	3.9	4.7
14	Porosity	19.5	18.4	17.2

11.2.5 BIOLOGICAL ENVIRONMENT

FLORA

For measuring the extent of flora present in the study area, the area is divided in to 4 quadrants. The flora population in each quadrant is summed up for the total population in the study area. Field survey is done. Erukku, Aavarai and Nayuruvi are found in lease area. In the buffer zone, common trees like Neem, papaya, mango, teak, etc., and shrubs like Avarai, Aloe vera, etc., climbers like Kovai, jasmine etc., are found.

FAUNA

In the study area, commonly found animals like dogs, cats, bush rat, cows, birds like crow, Myna, Sparrow, etc., were found.

11.2.6 LAND USE

The land use land cover data is found using the Geo EYE satellite imagery. The number of bands used are 10. The land use classification is given below:

Major Land Use Units of the Study Area in Percentage						
S. No	**1st Level Classification**	**Area in (sq.km)**	**Percentage (%)**	**2nd Level Classification**	**Area in (sq.km)**	**Percentage (%)**
1	Built-up or habitation	20.14	6.15	Residential	20.14	6.15
				Commercial/Industrial		
2	Agriculture	151.03	46.12	Crop/fallow land	151.03	46.12
				Plantation		
3	Forest	137.23	41.90	Forest	137.23	41.90
4	Water bodies	15.75	4.81	Reservoir/Lake /Pond	6.8	2.08
				River/Stream	8.95	2.73
5	Waste Land	2.79	0.85	Open without scrub	1.23	0.38
				Open with scrub	1.56	0.48
6	Mines	0.56	0.17	Mines	0.56	0.17
Total		**327.5**	**100**		**327.5**	**100**

11.2.7 SOCIO ECONOMIC ENVIRONMENT

The socio-economic environment of the study area is studied by conducting primary sites through site visits and conducting sample surveys. The secondary data obtained from Census 2011 is also used. The following data area collected from secondary data.

- Demographic pattern.
- Health pattern
- Occupational structure.

The expert visited 5 villages in the study area namely Thangal, Pichanatham, Karadikudi, Odiyathur and Anaicut villages. Discussions were held with the people from nearby locality to study the social and economic conditions prevailing in the area. The expert also visited nearby hospitals, primary health centres and Balwadis/Anganwadis. The following observations were made.

Primary schools are available in many villages. For hospital facilities, people in the locality have to go to hospital in Anaicut which is about 6.73 Km -NE from the lease area. Major schools with higher secondary and senior secondary schools are located in Anaicut. The major Panchayat Union located in the area is in Vellore. Facilities like petrol pump stations, ATM facility are available in Anaicut.

11.2.8 HYDROGEOLOGY OF THE LEASE AREA

The hydrological and hydrogeological pattern of the study area is studied in detail using satellite imagery. Within 10km radius from the proposed site, there is Periya Eri which is located at a distance of 2.00 km in Northwest direction, Agaram Aru is located at a distance of 4.30 km in Northwest direction, Palar River is located at a distance of 7.44 km in Northern direction and Bahuda River is located at a distance of 7.50 km in Northern direction respectively. The water is temporarily found only during the rainy season.

In this representation in the two seasons, the water level substantially gets fall-down in the non-monsoon season, because of the rainfall impact and it extended up to the Monsoon season.

In the study area, the shallow aquifer is developed through dug wells and deeper aquifer through tube wells. The study has revealed that potential fractures are encountered at deeper levels.

Rain water collected in the tanks in the region acts as a good source of water during monsoon season. In order to increase the recharge, tanks, and percolation ponds may be provided with the recharge wells/recharge shafts penetrating this impervious layer to make it more effective in recharging the aquifer.

11.3 ANTICIPATED ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

Environmental impacts on the following environments are identified.

- Land environment
- Water environment
- Biological Environment
- Air environment
- Noise environment
- Socio Economic Environment

11.3.1 LAND ENVIRONMENT: IMPACT AND MITIGATION MEASURES

The major impact due to this project on land environment is the change in land use. Since this quarry is a small one and the production is less, mining activity will be carried out upto 32m (17m Above Ground Level and 15m Below Ground level for the period of five years). Other than quarrying of minerals, no other change will be done since there is no dumping. To prevent soil erosion during monsoon season, garland drain will be constructed with silt traps. At the mine closure stage, 1.50.20 Ha of lease area will be left as rain water harvesting pond, 0.20.0 Ha will be developed with green belt. For this, plants like Pungai, Vagai, Vembu, Manjal konrai, Naval, Puvarasu, etc., are selected. A total of 240 trees are planned to be planted inside the lease area with spacing of 3m x 3m.

11.3.2 WATER ENVIRONMENT: IMPACT AND MITIGATION MEASURES

- There is no seasonal or perennial Odai within the M.L area. From the proposed site, Periya Eri is located at a distance of 2.00 km in Northwest direction, Agaram Aru is located at a distance of 4.30 km in Northwest direction, Palar River is located at a distance of 7.44 km in Northern direction and Bahuda River is located at a distance of 7.50 km in Northern direction respectively.
- Since these water bodies are located outside the lease area and there is no discharge of effluent or any untreated water from the mines will be made into these water bodies, there is no major impact. The project proponent will restrict the mining operation only within the lease and no other work will be carried out outside the mining lease.
- Rain water will be diverted into working area by constructing drains to store and use for dust suppression and greenbelt development. The total water required for this project will be 2.0 KLD and negligible sewage of 0.8 KLD will be generated, for which a septic tank with soak pit will be set up. In initial stage, water will be sourced from outside agencies, later the rainwater collected in the mine pit sump will be used for this purpose.
- The mining activity is not likely to intersect ground water as the ground water table occurs at a depth of 50m BGL in summer season. The mining will go up to the maximum depth of 32m (17m AGL and 15m BGL).

11.3.3 BIOLOGICAL ENVIRONMENT: IMPACT & MITIGATION MEASURES

- The mine lease area is devoid of major plantation. Shrubs and bushes are majorly found within the lease area. The proponent has planned to develop Green belt/Plantation by planting 1,160 Saplings. Out of this, 240 saplings will be planted in the safety zone area of 0.20 Ha for the period of 5 year and remaining 920 saplings will be planted outside the lease area such as at project surrounding schools, temples, road sides, etc.
- During mining activity major impacts like disturbance to animals, dust generation, change in land use & accidental fall of animals may occur. Below mitigation measures are followed to reduce the above impacts:

- Sirens will be blown before blasting in the mines. To reduce noise levels, plantation will be done. Blasting will be carried out only in the allotted time.
- To reduce dust generation, mist sprayers will be used. During transportation, the material will be covered with tarpaulin. Water sprinkling will be done to reduce generation of pollutants
- After the mine closure stage, the mine pit will be left as rain water collecting tank, which can attract bird population in the nearby areas.
- To prevent entry of animals, the mining area will be properly fenced.

11.3.4 AIR ENVIRONMENT: IMPACT AND MITIGATION MEASURES

- The major Air pollutants due to mining operations are fugitive emissions like PM_{10}, $PM_{2.5}$. Gaseous emissions like sulfur dioxide (SO_2) and oxides of nitrogen (NO_x) occurs due to excavation/loading equipment and due to vehicles plying on haul roads. Dust emission occurs due to drilling, blasting and transportation.
- The major mitigation measures include, Practicing Wet drilling during drilling operation, Water sprinkling in haul roads & loading area etc., providing dust masks for mines workers, Proper maintenance of vehicles used for transportation, conducting regular emission tests for vehicles used for transport, Development of greenbelt proposed in the safety zone of 7.5m barriers in the lease area.
- The Predicted Ground Level Concentrations for study period computed using AERMOD model and are plotted as isopleths in which represents the spatial distribution of the Predicted Ground Level Concentrations of $PM_{2.5}$ & PM_{10} due to emissions from mine.
- The post project Concentrations of PM_{10}, $PM_{2.5}$ after adopting necessary control measures shows that even in the worst-case scenario, the resultant added concentrations with baseline figures (GLC - base line + incremental) indicate that the values of ambient air quality for PM_{10} are in the range of 49.18 $\mu g/m^3$ to 61.83 $\mu g/m^3$ and for $PM_{2.5}$ are in the range of 22.60 $\mu g/m^3$ to 27.91 $\mu g/m^3$; whereas the cluster concentrations values for PM_{10} are in the range of 50.47

$\mu g/m^3$ to 64.01 $\mu g/m^3$ and for $PM_{2.5}$ are in the range of 22.72 $\mu g/m^3$ to 27.97 $\mu g/m^3$ which are within the statutory limits in each case.

11.3.5 NOISE ENVIRONMENT: IMPACT AND MITIGATION MEASURES

Impacts

- Noise generation in mining is due to operation like drilling, blasting and transportation of minerals within and outside the lease area.
- As per DGMS (Directorate General of Mines Safety) limits, the acceptable noise level is 85 dB(A) for an exposure period of 8 hours.
- Exposure to loud noise can also cause high blood pressure, heart disease, sleep disturbances and stress. Noise pollution also impacts the health and well-being of wildlife.
- Noise exceeding prescribed limits may cause impairment like abnormal loudness perception, tinnitus which causes a persistent high-pitched ringing in the ears, paracusis or distorted hearing.

Mitigation measures

- As the distance between the source and receptor increases, the noise level decreases. Hence, there will be a natural attenuation.
- The proponent has planned to develop green belt in the periphery of the lease area which diminishes sound volume by dampening them.
- All the equipment/machinery/tippers involved will be properly maintained to control noise generation.
- Conducting regular health checkups for employees involved.
- Employees will be made to work on shifts to reduce their exposure time.
- Use of ear muffs by the workers with occupational exposure to noise.

  Providing green walls/nets wherever possible.

By adopting these measures, the noise levels will be maintained well within MoEF&CC limits since the baseline value is low.

11.3.6 VIBRATION: IMPACT AND MITIGATION MEASURES

Impacts

- Though vibration will be only felt by the people working inside the lease area it is usually undesired.
- Vibration may also cause flyrocks.
- It may frighten the birds and small insects in the lease area. However, it will be felt only for a short period.

Mitigation measures

- Carrying out blasting on limited scale, only from 12:00 PM to 2:00 PM
- Control of fly rock and vibration by maintaining peak particle velocity within the standard as prescribed by the DGMS and MOEF&CC.
- Drilling parameters like depth, diameter and spacing will be properly designed to give proper blast;
- Supervising blasting by competent and statutory Foreman/ Mines Manager.

11.3.7 SOCIO ECONOMIC ENVIRONMENT: IMPACT AND MITIGATION MEASURES

The lease area is Patta land registered in the name of applicant vide patta no. 757 & 943. No rehabilitation is needed. Hence, there is no negative impact. The proponent has planned to spend INR 5,00,000/- Lakhs @ 2% of the project cost for CER activities. This amount will be subjected to change after public hearing.

11.3.8 OCCUPATIONAL HEALTH & SAFETY

Impacts

Mining activity may cause various health problems to the mines workers as follows:

- Dust generated during excavation, drilling, stone cutting, sizing and transportation may cause health problems like Silicosis, Asthma, Tuberculosis and other respiratory lungs disorders etc.
- Heavy weight lifting by the workers may cause injuries to arms, legs and back.
- Noise generated during the mining activity may cause Noise Induced Hearing Loss (NIHL).
- Risks include fly rocks, cracks or fissures due to improper mining methods leads

to unexpected accidents.

Mitigation measures

- The mines worker will be provided with dust mask to minimize the inhalation of the dust.
- Water sprinkling twice in a day is in practice on the haul roads, near excavation and roads to reduce the fugitive dust emission.
- Ear muffs will be supplied to the workers working in the noise prone area
- The mining site will be supplied with first aid facilities and the entire mines worker will have access to that.
- Providing green belt for air pollutant and noise attenuation
- Ensuring slope stability
- Employing only trained professionals for blasting
- Conducting Pre-Medical Examination for employees before inducting
- Conducting periodical Medical Examination as per DGMS.
- Keeping fire extinguisher in place
- Educating the employees about how to handle unexpected happenings
- Posting information containing emergency contact numbers in mines office

By adopting all these measures, the safety of the employees working in the quarry will be ensured.

11.4 ENVIRONMENTAL MONITORING PROGRAMME

- Monitoring is done to measure the efficiency of control measures implemented. Regular monitoring of various environmental parameters like air, water, noise and soil environments is needed to assess the status of environment during the project operation.
- A schedule is framed with timeline to monitor various parameters during the operation of the project.
- To evaluate the effectiveness of environmental management programme, regular monitoring of the important environmental parameters will be taken up. Air monitoring will be carried out once in 3 months, water sample will be collected once in a season, noise will be monitored once in 3 months, soil samples will be analyzed once per season. Monitoring of the environmental

parameters would be done at appropriate and sensitive areas.

- Once the data thus obtained will be incorporated in the EC Compliance report submitted to the Regional office, MoEF&CC. The measurement methodologies will be as per CPCB/BIS/MoEF&CC/DGMS norms.
- At last, the revised total EMP Cost is 217.01 Lakhs for a period of five years have been proposed. i.e., Capital cost of Rs. 60.25 Lakhs + Recurring cost of Rs. 156.76 lakhs (For Five years).

11.5 PROJECT BENEFITS

Financial benefits

- This project will contribute financially through payment of taxes like royalty, GST, etc.
- The project will also contribute via CER.
- The demands of people during public hearing will also be considered by the project proponent.

Social benefits

- This project provides employment to 24 people directly & indirectly. Local people will be hired for unskilled labour.
- For CER, INR 5,00,000/- Lakhs will be allocated through which nearby schools, hospitals will be benefitted.

11.6 CONCLUSION

Various aspects of mining activities were considered, and related impacts were evaluated. Considering all the possible ways to mitigate the Environmental concerns, an Environmental Management Plan was prepared and INR 156.76 Lakhs has been allocated for the same. The EMP is dynamic, flexible, and subjected to periodic review. For projects where major environmental impacts are associated, EMP will be under regular review. Thus, the proper steps will be taken to accomplish all the goals mentioned in the EMP, and the project will have a positive impact on the study area.

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CHAPTER - 12

DISCLOSURE OF CONSULTANTS

Global Mining Solutions is a NABET Accredited EIA consultant as per NABET certificate NABET/EIA/2326/IA 0110. The registered office of Global Mining Solutions is at Plot No.6, S.F.No.13/2 A2, VS City, RC Chettypatty, Kottamettupatty, Omalur, Salem, Tamilnadu-636455.

Declaration by Experts contributing to the proposed Rough Stone & Gravel Quarry over an extent of 2.31.50 Ha, while total cluster area of 10.33.5 Ha at Karadikudi Village, Anaicut Taluk, Vellore District, Tamil Nadu State.

I, hereby, certify that I was a part of the EIA team that developed the above EIA.

EIA Coordinator Name: M. Manikandan



Signature & Date

Period of involvement: Post Monsoon Season (October 2023 to December 2023).

Contact information:

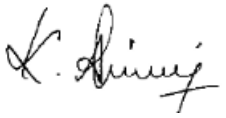
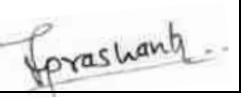
M/s Global Mining Solutions

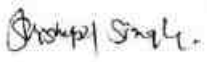
Plot No.6, SF No. 13/2, A2, VS City, RC Chettypatty,

Kottamettupatty, Omalur,

Salem, Tamil Nadu – 636 455

S. No.	Functional areas	Name of the expert/s	Involvement (period and task**)	Signature and Date
1	*AP*	*Dhanalakshmi Ramanathan*	*Assessment of existing air quality, Impact of the project on ambient air and suggested mitigation measures for air pollution.* *Period: Oct 2023 to Dec 2023.*	

2	*WP*	*Abirami Kaliaperumal*	*Assessment of existing water quality, impact of the project on surface and ground water quality, suggested mitigation measures for minimizing the impact.* *Period: Oct 2023 to Dec 2023.*	
3	*SHW*	*Ramadoss N*	*Assessment of waste generated from the project, suggested waste management practices.* *Period: Oct 2023 to Dec 2023.*	
4	*SE*	*Saraswathy K*	*Baseline SE studies. Data compilation and assessment. Impact of the project on SE status of the area. Formulation of CER plan.* *Period: Oct 2023 to Dec 2023.*	
5	*EB*	*Saravanan S*	*Baseline data collection of related to ecology of the area.* *Period: Oct 2023 to Dec 2023.*	
6	*HG*	*Ravinthiran N*	*Hydrogeological feature of the area. Ground water depth and impact of project on ground water of the area.* *Period: Oct 2023 to Dec 2023.*	
7	*AQ*	*Srilatha Thiruveedhula*	*Air quality modeling utilizing the area source model. Predication of the ground level concentration of the dust. Suggesting suitable mitigation measures.* *Period: Oct 2023 to Dec 2023.*	
8	*NV*	*Dhanalakshmi Ramanathan*	*Ambient noise study of the area. Incremental noise generation due to quarry operation and impact of the noise due to the project.* *Period: Oct 2023 to Dec 2023.*	
9	*LU*	*Srilatha Thiruveedhula*	*Preparation of land use map based on satellite imagery. Land use classification and analysis. Impact prediction of the project on the surrounding land environment.* *Period: Oct 2023 to Dec 2023.*	
10	*RH*	*S.V. Prashant*	*Identification of the Risk related to the mining activities. Preparation of emergency disaster management*	

			plan. Plan for supply of safety equipment for the worker. *Period: Oct 2023 to Dec 2023.*	
11	*SC*	*Shisu Pal Singh*	*Soil monitoring, secondary data collection on soil type, soil management practices, utilization of topsoil.* *Period: Oct 2023 to Dec 2023.*	
12	*GEO*	*Valliappan Meyyappan*	*Geological map, stability of quarry and dump, management plan for mine stability, after use of mining quarry and geological feature of the area.* *Period: Oct 2023 to Dec 2023.*	

TM-FAE:

S.No	Name of TM (FAE)	Functional Area	Approved FAE (to work under)	Period of involvement	Type of work	Signature
1	M.Prabu	LU	Srilatha Thiruveedhula	*Oct 2023 to Dec 2023.*	Associated with FAE in preparing Land use map based on satellite imagery, Land use classification and analysis, Impact prediction on surrounding land environment	
		HG	Ashok Kumar Rajagopal		Associated with FAE in studying hydrogeological pattern of study area, Studying ground water and the impact of the project on ground water	
2	M. Manikandan	EB	Saravanan S	*Oct 2023 to Dec 2023.*	Associated with the expert in baseline data collection related to ecology of the study area	
		SC	Shishu Pal Singh		Associated with the expert in Soil monitoring, secondary data collection on soil type, soil management practices, utilization of top soil	

TM-FAA:

S. No	Name of TM (FAA)	Functional Area	Approved FAE (to work under)	Period of involvement	Type of work	Signature
1	Suresh Mani	WP	*Abirami Kaliaperumal*	*Oct 2023 to Dec 2023.*	Associated with the expert in assessing existing water quality, studying impact of the project on surface and ground water quality, suggesting mitigation measures for minimizing impact	M.Suresh
		AP	*Dhanalakshmi Ramanathan*		Associated with expert in assessing existing air quality, impact of the project on ambient air and suggesting mitigation measures for air pollution	
2	S. Kamaraj	SC	Shishu Pal Singh	*Oct 2023 to Dec 2023.*	Associated with the expert in Soil monitoring, secondary data collection on soil type, soil management practices, utilization of top soil	S. Kamaraj
		RH	S.V.Prashant		Associated with the expert in Identification of the Risk related to the mining activities. Preparation of emergency disaster management plan. Plan for supply of safety equipment for the workers	
3.	Asan Ali S	GEO	*Valliappan Meyyappan*	*Oct 2023 to Dec 2023.*	Associated with the expert in preparing Geological map, assessing stability of quarry slope faces and dump, management plan for mine stability, after use of mining quarry and geological features of the area	S. Asan ali
		NV	Dhanalakshmi Ramanathan		Associated with the expert in monitoring and analysis of blast induced ground vibration in order to develop the site-specific equation for its prediction, monitoring of fly rocks & air blast (noise), preparation of SOP's for the safety	

					blasting practice in the mines.	
4.	Mownica. B	AP	Dhanalakshmi Ramanathan	*Oct 2023 to Dec 2023.*	Associated with expert in assessing existing air quality, impact of the project on ambient air and suggesting mitigation measures for air pollution	Mownica
		NV	Dhanalakshmi Ramanathan		Associated with the expert in monitoring and analysis of blast induced ground vibration in order to develop the site-specific equation for its prediction, monitoring of fly rocks & air blast (noise), preparation of SOP's for the safety blasting practice in the mines.	
5.	G.Balasubramani	GEO	*Valliappan Meyyappan*	*Oct 2023 to Dec 2023.*	with the expert in preparing Geological map, assessing stability of quarry slope faces and dump, management plan for mine stability, after use of mining quarry and geological features of the area	G. Balasubramani
		NV	Dhanalakshmi Ramanathan		Associated with the expert in monitoring and analysis of blast induced ground vibration in order to develop the site-specific equation for its prediction, monitoring of fly rocks & air blast (noise), preparation of SOP's for the safety blasting practice in the mines.	

ANNEXURE-1

THIRU.DEEPAK S.BILGI, I.F.S.
MEMBER SECRETARY

STATE LEVEL ENVIRONMENT IMPACT ASSESSMENT AUTHORITY-TAMILNADU
3rd Floor, Panagal Maaligai,
No.1, Jeenis Road, Saidapet,
Chennai - 600 015.
Phone No. 044-24359973
Fax No. 044-24359975

TERMS OF REFERENCE (ToR)

Lr No.SEIAA-TN/F.No.9971/SEAC/ToR- 1495/2023 Dated:22.06.2023.

To

Thiru.R.Natarajan,
S/o.Rangasamy,
147, Ayyagoundarpatti,
Kollamangalam Village,
Gudiyatham Taluk,
Vellore District-638509

Sir / Madam,

Sub: SEIAA, Tamil Nadu – Terms of Reference with public Hearing (ToR) for the Proposed Rough stone & Gravel Quarry over an extent of 2.31.50Ha in SF.No. 253/7, 259/5, 259/2 & 259/4 at Karadikudi Village, Anaicut Taluk, Vellore District, Tamil Nadu by Thiru.R.Natarajan - under project category – "B1" and Schedule S.No.1 (a) – ToR issued along with Public Hearing - preparation of EIA report – Regarding.

Ref: 1. Online proposal No. SIA/TN/MIN/424208/2023, dated:31.03.2023.
2. Your application submitted for Terms of Reference dated:10.04.2023.
4. Minutes of the 382nd SEAC meeting held on 09.06.2023.
5.Minutes of the 632nd SEIAA meeting held on 21.06.2023 & 22.06.2023.

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

The proponent, Thiru.R.Natarajan has submitted application for Terms of Reference (ToR) in Form-I, Pre- Feasibility report for Proposed Rough stone & Gravel Quarry over an extent of 2.31.50Ha

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in SF.No. 253/7, 259/5, 259/2 & 259/4 at Karadikudi Village, Anaicut Taluk, Vellore District, Tamil Nadu.

Discussion by SEAC and the Remarks:-

Proposed Rough stone & Gravel Quarry over an extent of 2.31.50Ha in SF.No. 253/7, 259/5, 259/2 & 259/4 at Karadikudi Village, Anaicut Taluk, Vellore District, Tamil Nadu by Thiru.R.Natarajan - For Terms of Reference.

(SIA/TN/MIN/424208/2023, Dt. 31.03.2023)

The proposal was placed in the 382nd SEAC Meeting held on 09.06.2023. The details of the project furnished by the proponent are given on the website (parivesh.nic.in).

The SEAC noted the following:

1. The Project Proponent, Thiru.R.Natarajan has applied for Terms of Reference for the Proposed Rough stone & Gravel Quarry over an extent of 2.31.50Ha in SF.No. 253/7, 259/5, 259/2 & 259/4 of Karadikudi Village, Anaicut Taluk, Vellore District,Tamil Nadu.
2. The project/activity is covered under Category "B1" of Item 1(a) " Mining of mineral of the Schedule to the EIA Notification, 2006.
3. As per the mining plan the lease period is 5 years. The mining plan is for the period of Five years & the production should not exceed 2,08,760m^3 of rough stone & 34,184m^3 of Gravel with an ultimate depth of mining 32m (17m AGL + 15m BGL) (2m Gravel + 30m Rough stone). The annual peak production is 42,600m^3 of rough stone (3rd Year) & 17,940m^3 of Gravel (2nd Year).

Based on the presentation made by the proponent, **SEAC decided to recommend for grant of Terms of Reference (TOR) with Public Hearing,** subject to the following TORs, in addition to the standard terms of reference for EIA study for non-coal mining projects and details issued by the MOEF & CC to be included in EIA/EMP Report:

1. The proponent is requested to carry out a survey and enumerate on the structures located within 50m, 100m, 150m, 200m, 250m, 300m and 500m from the boundary of the mine lease area.
2. The proponent shall discuss the funds for mitigation measures to be included in the EMP.
3. The proponent shall adhere to the bench height - 5m as stated in the approved mining plan.
4. The PP shall frame Environmental policy and shall appoint Environmental Manger etc.,

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5. The Project Proponent shall conduct the hydro-geological study considering the contour map of the water table detailing the number of ground water pumping & open wells, and surface water bodies such as rivers, tanks, canals, ponds etc. within 1 km (radius) along with the collected water level data for both monsoon and non-monsoon seasons from the PWD / TWAD so as to assess the impacts on the wells due to mining activity. Necessary data and documentation in this regard may be provided.
6. The PP shall spell out 'a 'Slope Stability Action Plan' for the proposed quarry covering the existing condition of the quarry wall including the overall pit slope angle where the proposed depth exceeds 30 m and it shall cover the aspects of stability of quarry walls including the access ramp keeping the benches intact.
7. If the blasting operation is to be carried out, the PP shall present a conceptual design for carrying out the NONEL initiation based controlled blasting operation including the line drilling & muffle blasting techniques and a Simulation Model indicating the anticipated Blast-induced Ground Vibration levels in the proposed quarry as stipulated by the DGMS Circular No.7 of 1997, during the EIA Proposal.
8. The PP shall furnish DFO letter stating that the proximity distance of Reserve Forests, Protected Areas, Sanctuaries, Tiger reserve etc., upto a radius of 25 km from the proposed site.
9. The PP shall provide individual notice regarding the Public Hearing to the nearby house owners located in the vicinity of the project site.
10. In the case of proposed lease in an existing (or old) quarry where the benches are non-existent (or) partially formed critical of the bench geometry approved in the Mining Plan, the Project Proponent (PP) shall prepare and submit an 'Action Plan' for carrying out the realignment of the 'highwall' benches to ensure slope stability in the proposed quarry lease which shall be vetted by the concerned Asst. Director of Geology and Mining, during the time of appraisal for obtaining the EC.
11. 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.
12. Since the quarry lies in a cluster situation, the PP shall furnish a Standard Operating Procedure for carrying out the safe blasting operation while considering the adjacent quarries lies in a radial distance of 500 m from their quarry.

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13. Details of Green belt & fencing shall be included in the EIA Report.
14. 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.
15. 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,

    - What was the period of the operation and stoppage of the earlier mines with last work permit issued by the AD/DD mines?
    - Quantity of minerals mined out.
    - Highest production achieved in any one year
    - Detail of approved depth of mining.
    - Actual depth of the mining achieved earlier.
    - Name of the person already mined in that leases area.
    - If EC and CTO already obtained, the copy of the same shall be submitted.
    - Whether the mining was carried out as per the approved mine plan (or EC if issued) with stipulated benches.

16. 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).
17. The PP shall carry out Drone video survey covering the cluster, Green belt , fencing etc.,
18. 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.
19. 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.

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20. The Project Proponent shall provide the Organization chart indicating the appointment of various statutory officials and other competent persons to be appointed as per the provisions of Mines Act'1952 and the MMR, 1961 for carrying out the quarrying operations scientifically and systematically in order to ensure safety and to protect the environment.
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.
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.
23. Rain water harvesting management with recharging details along with water balance (both monsoon & non-monsoon) be submitted.
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.
25. Details of the land for storage of Overburden/Waste Dumps (or) Rejects outside the mine lease, such as extent of land area, distance from mine lease, its land use, R&R issues, if any, should be provided.
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.
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.
28. Impact on local transport infrastructure due to the Project should be indicated.

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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.
30. A detailed mine closure plan for the proposed project shall be included in EIA/EMP report which should be site-specific.
31. Public Hearing points raised and commitments of the Project Proponent on the same along with time bound Action Plan with budgetary provisions to implement the same should be provided and also incorporated in the final EIA/EMP Report of the Project and to be submitted to SEIAA/SEAC with regard to the Office Memorandum of MoEF& CC accordingly.
32. The Public hearing advertisement shall be published in one major National daily and one most circulated vernacular daily.
33. The PP shall produce/display the EIA report, Executive summery and other related information with respect to public hearing in Tamil Language also.
34. 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.
35. 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-Iin 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.
36. Taller/one year old Saplings raised in appropriate size of bags, preferably eco-friendly bags should be planted as per the advice of local forest authorities/botanist/Horticulturist with regard to site specific choices. The proponent shall earmark the greenbelt area with GPS coordinates all along the boundary of the project site with at least 3 meters wide and in between blocks in an organized manner
37. 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.

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SEIAA-TN

38. 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.
39. 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.
40. 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.
41. 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.
42. Details of litigation pending against the project, if any, with direction /order passed by any Court of Law against the Project should be given.
43. Benefits of the Project if the Project is implemented should be spelt out. The benefits of the Project shall clearly indicate environmental, social, economic, employment potential, etc.
44. 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.
45. 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.
46. Concealing any factual information or submission of false/fabricated data and failure to comply with any of the conditions mentioned above may result in withdrawal of this Terms of Conditions besides attracting penal provisions in the Environment (Protection) Act, 1986.

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Appendix -I
List of Native Trees Suggested for Planting

No	Scientific Name	Tamil Name	Tamil Name
1	*Aegle marmelos*	Vilvam	விளவம்
2	*Adenaanthera pavonina*	Manjadi	மஞ்சாடி ஆனைக்குன்றிமணி
3	*Albizia lebbeck*	Vaagai	வாகை
4	*Albizia amara*	Usil	உசில்
5	*Bauhinia purpurea*	Mantharai	மந்தாரை
6	*Bauhinia racemosa*	Aathi	ஆத்தி
7	*Bauhinia tomentos*	Iruvathi	இருவாத்தி
8	*Buchanania axillaris*	Kattuma	காட்டுமா
9	*Borassus flabellifer*	Panai	பனை
10	*Butea monosperma*	Murukkamaram	முருக்கமரம்
11	*Bobax ceiba*	Ilavu, Sevvilavu	இலவு
12	*Calophyllum inophyllum*	Punnai	புன்னை
13	*Cassia fistula*	Sarakondrai	சரக்கொன்றை
14	*Cassia roxburghii*	Sengondrai	செங்கொன்றை
15	*Chloroxylon swietenia*	Purasamaram	புரசு மரம்
16	*Cochlospermum religiosum*	Kongu, Manjalllavu	கோங்கு, மஞ்சள் இலவு
17	*Cordia dichotoma*	Naruvuli	நருவுளி.
18	*Crateva adansoni*	Mavalingum	மாவிலங்கம்
19	*Dillenia indica*	Uva, Uzha	உசா
20	*Dillenia pentagyna*	SiruUva, Sitruzha	சிறு உசா
21	*Diospyro sebenum*	Karungali	கருங்காலி
22	*Diospyro schloroxylon*	Vagunai	வாகனை
23	*Ficus amplissima*	Kalltchi	கல் இச்சி
24	*Hibiscus tiliaceou*	Aatrupoovarasu	ஆற்றுப்பூவரசு
25	*Hardwickia binata*	Aacha	ஆச்சா
26	*Holoptelia integrifolia*	Aavili	ஆவா மரம், ஆயில்
27	*Lannea coromandelica*	Odhiam	ஓதியம்
28	*Lagerstroemia speciosa*	Poo Marudhu	பூ மருது
29	*Lepisanthus tetraphylla*	Neikottaimaram	நெய் கொட்டை மரம்
30	*Limonia acidissima*	Vila maram	விளா மரம்
31	*Litsea glutinos*	Pisinpattai	அரம்பா, பிசின்பட்டை
32	*Madhuca longifolia*	Illuppai	இலுப்பை
33	*Manilkara hexandra*	UlakkaiPaalai	உலக்கை பாலை
34	*Mimusops elengi*	Magizhamaram	மகிழமரம்
35	*Mitragyna parvifolia*	Kadambu	கடம்பு
36	*Morinda pubescens*	Nuna	நுணா
37	*Morinda citrifolia*	Vellai Nuna	வெள்ளை நுணா
38	*Phoenix sylvestre*	Eachai	ஈச்சமரம்
39	*Pongamia pinnat*	Pungam	புங்கம்

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40	*Premna mollissima*	Munnai	முன்னை
41	*Premna serratifolia*	Narumunnai	நறு முன்னை
42	*Premna tomentosa*	Malaipoovarasu	மலை பூவரசு
43	*Prosopis cineria*	Vanni maram	வன்னி மரம்
44	*Pterocarpus marsupium*	Vengai	வேங்கை
45	*Pterospermum canescens*	Vennangu Tada	வெண்ணாங்கு
46	*Pterospermum xylocarpum*	Polavu	புலவு
47	*Putranjiva roxburghi*	Karupala	கரும்பாலா
48	*Salvadora persica*	Ugaa Maram	உகா மரம்
49	*Sapindus emarginatus*	Manipungan, Soapukai	மணிபுங்கன் சோபுக்காய்
50	*Saraca asoca*	Asoca	அசோகா
51	*Streblus asper*	Piray maram	பிரய் மரம்
52	*Strychnos nuxvomic*	Yetti	எட்டி
53	*Strychnos potatorum*	Therthang Kottai	தேத்தான் கொட்டை
54	*Syzygium cumini*	Naval	நாவல்
55	*Terminalia belleric*	Thandri	தான்றி
56	*Terminalia arjuna*	Ven marudhu	வெண் மருது
57	*Toona ciliate*	Sandhana vembu	சந்தன வேம்பு
58	*Thespesia populnea*	Puvarasu	பூவரசு
59	*Walsuratrifoliata*	valpura	வால்பூரா
60	*Wrightia tinctoria*	Veppalai	வெப்பாலை
61	*Pithecellobium dulce*	Kodukkapuli	கொடுக்காப்புளி

Discussion by SEIAA and the Remarks:-

The proposal was placed in the 632nd Authority meeting held on 21.06.2023 & 22.06.2023. The authority noted that this proposal was placed for appraisal in 382nd meeting of SEAC held on 09.06.2023, the committee has furnished its recommendations for granting ToR with Public hearing subject to the conditions stated therein. After detailed discussions, the Authority accepts the recommendation of SEAC and decided to grant **Terms of Reference (ToR) along with Public Hearing** under cluster for undertaking the combined Environment Impact Assessment Study and preparation of separate Environment Management Plan subject to the conditions as recommended by SEAC & normal conditions in addition to the conditions in '**Annexure B**' of this minute

Annexure 'B'

Cluster Management Committee

1. Cluster Management Committee shall be framed which must include all the proponents in the cluster as members including the existing as well as proposed quarry.

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2. The members must coordinate among themselves for the effective implementation of EMP as committed including Green Belt Development, Water sprinkling, tree plantation, blasting etc.,
3. The List of members of the committee formed shall be submitted to AD/Mines before the execution of mining lease and the same shall be updated every year to the AD/Mines.
4. Detailed Operational Plan must be submitted which must include the blasting frequency with respect to the nearby quarry situated in the cluster, the usage of haul roads by the individual quarry in the form of route map and network.
5. The committee shall deliberate on risk management plan pertaining to the cluster in a holistic manner especially during natural calamities like intense rain and the mitigation measures considering the inundation of the cluster and evacuation plan.
6. The Cluster Management Committee shall form Environmental Policy to practice sustainable mining in a scientific and systematic manner in accordance with the law. The role played by the committee in implementing the environmental policy devised shall be given in detail.
7. The committee shall furnish action plan regarding the restoration strategy with respect to the individual quarry falling under the cluster in a holistic manner.
8. The committee shall furnish the Emergency Management plan within the cluster.
9. The committee shall deliberate on the health of the workers/staff involved in the mining as well as the health of the public.
10. The committee shall furnish an action plan to achieve sustainable development goals with reference to water, sanitation & safety.
11. The committee shall furnish the fire safety and evacuation plan in the case of fire accidents.

Impact study of mining

12. Detailed study shall be carried out in regard to impact of mining around the proposed mine lease area covering the entire mine lease period as per precise area communication order issued from reputed research institutions on the following
    a) Soil health & soil biological, physical land chemical features .
    b) Climate change leading to Droughts, Floods etc.
    c) Pollution leading to release of Greenhouse gases (GHG), rise in Temperature, & Livelihood of the local people.
    d) Possibilities of water contamination and impact on aquatic ecosystem health.
    e) Agriculture, Forestry & Traditional practices.

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f) Hydrothermal/Geothermal effect due to destruction in the Environment.

g) Bio-geochemical processes and its foot prints including environmental stress.

h) Sediment geochemistry in the surface streams.

Agriculture & Agro-Biodiversity

13. Impact on surrounding agricultural fields around the proposed mining Area.
14. Impact on soil flora & vegetation around the project site.
15. Details of type of vegetations including no. of trees & shrubs within the proposed mining area and. If so, transplantation of such vegetations all along the boundary of the proposed mining area shall committed mentioned in EMP.
16. The Environmental Impact Assessment should study the biodiversity, the natural ecosystem, the soil micro flora, fauna and soil seed banks and suggest measures to maintain the natural Ecosystem.
17. Action should specifically suggest for sustainable management of the area and restoration of ecosystem for flow of goods and services.
18. The project proponent shall study and furnish the impact of project on plantations in adjoining patta lands, Horticulture, Agriculture and livestock.

Forests

19. The project proponent shall detailed study on impact of mining on Reserve forests free ranging wildlife.
20. The Environmental Impact Assessment should study impact on forest, vegetation, endemic, vulnerable and endangered indigenous flora and fauna.
21. The Environmental Impact Assessment should study impact on standing trees and the existing trees should be numbered and action suggested for protection.
22. The Environmental Impact Assessment should study impact on protected areas, Reserve Forests, National Parks, Corridors and Wildlife pathways, near project site.

Water Environment

23. Hydro-geological study considering the contour map of the water table detailing the number of ground water pumping & open wells, and surface water bodies such as rivers, tanks, canals, ponds etc. within 1 km (radius) so as to assess the impacts on the nearby waterbodies due to mining activity. Based on actual monitored data, it may clearly be shown whether working will intersect groundwater. Necessary data and documentation in this regard may be provided, covering the entire mine lease period.

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24. Erosion Control measures.
25. Detailed study shall be carried out in regard to impact of mining around the proposed mine lease area on the nearby Villages, Water-bodies/ Rivers, & any ecological fragile areas.
26. The project proponent shall study impact on fish habitats and the food WEB/ food chain in the water body and Reservoir.
27. The project proponent shall study and furnish the details on potential fragmentation impact on natural environment, by the activities.
28. The project proponent shall study and furnish the impact on aquatic plants and animals in water bodies and possible scars on the landscape, damages to nearby caves, heritage site, and archaeological sites possible land form changes visual and aesthetic impacts.
29. The Terms of Reference should specifically study impact on soil health, soil erosion, the soil physical, chemical components and microbial components.
30. The Environmental Impact Assessment should study on wetlands, water bodies, rivers streams, lakes and farmer sites.

Energy

31. The measures taken to control Noise, Air, Water, Dust Control and steps adopted to efficiently utilise the Energy shall be furnished.

Climate Change

32. The Environmental Impact Assessment shall study in detail the carbon emission and also suggest the measures to mitigate carbon emission including development of carbon sinks and temperature reduction including control of other emission and climate mitigation activities.
33. The Environmental Impact Assessment should study impact on climate change, temperature rise, pollution and above soil & below soil carbon stock.

Mine Closure Plan

34. Detailed Mine Closure Plan covering the entire mine lease period as per precise area communication order issued.

EMP

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

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36. The Environmental Impact Assessment should hold detailed study on EMP with budget for Green belt development and mine closure plan including disaster management plan.

Risk Assessment

37. To furnish risk assessment and management plan including anticipated vulnerabilities during operational and post operational phases of Mining.

Disaster Management Plan

38. To furnish disaster management plan and disaster mitigation measures in regard to all aspects to avoid/reduce vulnerability to hazards & to cope with disaster/untoward accidents in & around the proposed mine lease area due to the proposed method of mining activity & its related activities covering the entire mine lease period as per precise area communication order issued.

Others

39. The project proponent shall furnish VAO certificate with reference to 300m radius regard to approved habitations, schools, Archaeological sites, Structures, railway lines, roads, water bodies such as streams, odai, vaari, canal, channel, river, lake pond, tank etc.
40. As per the MoEF& CC office memorandum F.No.22-65/2017-IA.III dated: 30.09.2020 and 20.10.2020 the proponent shall address the concerns raised during the public consultation and all the activities proposed shall be part of the Environment Management Plan.
41. The project proponent shall study and furnish the possible pollution due to plastic and microplastic on the environment. The ecological risks and impacts of plastic & microplastics on aquatic environment and fresh water systems due to activities, contemplated during mining may be investigated and reported.

A. STANDARD TERMS OF REFERENCE

1) Year-wise production details since 1994 should be given, clearly stating the highest production achieved in any one year prior to 1994. It may also be categorically informed whether there had been any increase in production after the EIA Notification 1994 came into force, w.r.t. the highest production achieved prior to 1994.
2) A copy of the document in support of the fact that the Proponent is the rightful lessee of the mine should be given.

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3) All documents including approved mine plan, EIA and Public Hearing should be compatible with one another in terms of the mine lease area, production levels, waste generation and its management, mining technology etc. and should be in the name of the lessee.

4) All corner coordinates of the mine lease area, superimposed on a High Resolution Imagery/ topo sheet, topographic sheet, geomorphology and geology of the area should be provided. Such an Imagery of the proposed area should clearly show the land use and other ecological features of the study area (core and buffer zone).

5) Information should be provided in Survey of India Topo sheet in 1:50,000 scale indicating geological map of the area, geomorphology of land forms of the area, existing minerals and mining history of the area, important water bodies, streams and rivers and soil characteristics.

6) Details about the land proposed for mining activities should be given with information as to whether mining conforms to the land use policy of the State; land diversion for mining should have approval from State land use board or the concerned authority.

7) It should be clearly stated whether the proponent Company has a well laid down Environment Policy approved by its Board of Directors? If so, it may be spelt out in the EIA Report with description of the prescribed operating process/procedures to bring into focus any infringement/deviation/violation of the environmental or forest norms/ conditions? The hierarchical system or administrative order of the Company to deal with the environmental issues and for ensuring compliance with the EC conditions may also be given. The system of reporting of non-compliances / violations of environmental norms to the Board of Directors of the Company and/or shareholders or stakeholders at large, may also be detailed in the EIA Report.

8) Issues relating to Mine Safety, including subsidence study in case of underground mining and slope study in case of open cast mining, blasting study etc. should be detailed. The proposed safeguard measures in each case should also be provided.

9) The study area will comprise of 10 km zone around the mine lease from lease periphery and the data contained in the EIA such as waste generation etc. should be for the life of the mine / lease period.

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10) Land use of the study area delineating forest area, agricultural land, grazing land, wildlife sanctuary, national park, migratory routes of fauna, water bodies, human settlements and other ecological features should be indicated. Land use plan of the mine lease area should be prepared to encompass preoperational, operational and post operational phases and submitted. Impact, if any, of change of land use should be given.

11) Details of the land for any Over Burden Dumps outside the mine lease, such as extent of land area, distance from mine lease, its land use, R&R issues, if any, should be given.

12) Certificate from the Competent Authority in the State Forest Department should be provided, confirming the involvement of forest land, if any, in the project area. In the event of any contrary claim by the Project Proponent regarding the status of forests, the site may be inspected by the State Forest Department along with the Regional Office of the Ministry to ascertain the status of forests, based on which, the Certificate in this regard as mentioned above be issued. In all such cases, it would be desirable for representative of the State Forest Department to assist the Expert Appraisal Committees.

13) Status of forestry clearance for the broken up area and virgin forestland involved in the Project including deposition of Net Present Value (NPV) and Compensatory Afforestation (CA) should be indicated. A copy of the forestry clearance should also be furnished.

14) Implementation status of recognition of forest rights under the Scheduled Tribes and other Traditional Forest Dwellers (Recognition of Forest Rights) Act, 2006 should be indicated.

15) The vegetation in the RF / PF areas in the study area, with necessary details, should be given.

16) A study shall be got done to ascertain the impact of the Mining Project on wildlife of the study area and details furnished. Impact of the project on the wildlife in the surrounding and any other protected area and accordingly, detailed mitigative measures required, should be worked out with cost implications and submitted.

17) Location of National Parks, Sanctuaries, Biosphere Reserves, Wildlife Corridors, Ramsar site Tiger/ Elephant Reserves/(existing as well as proposed), if any, within 10 km of the mine lease should be clearly indicated, supported by a location map duly authenticated by Chief Wildlife Warden. Necessary clearance, as may be applicable to such projects due to proximity of the ecologically sensitive areas as mentioned above, should be obtained from the Standing Committee of National Board of Wildlife and copy furnished.

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18) A detailed biological study of the study area [core zone and buffer zone (10 km radius of the periphery of the mine lease)] shall be carried out. Details of flora and fauna, endangered, endemic and RET Species duly authenticated, separately for core and buffer zone should be furnished based on such primary field survey, clearly indicating the Schedule of the fauna present. In case of any scheduled-I fauna found in the study area, the necessary plan along with budgetary provisions for their conservation should be prepared in consultation with State Forest and Wildlife Department and details furnished. Necessary allocation of funds for implementing the same should be made as part of the project cost.

19) Proximity to Areas declared as 'Critically Polluted' or the Project areas likely to come under the 'Aravali Range', (attracting court restrictions for mining operations), should also be indicated and where so required, clearance certifications from the prescribed Authorities, such as the SPCB or State Mining Department should be secured and furnished to the effect that the proposed mining activities could be considered.

20) Similarly, for Coastal Projects, a CRZ map duly authenticated by one of the authorized agencies demarcating LTL, HTL, CRZ area, location of the mine lease with respect to CRZ, coastal features such as mangroves, if any, should be furnished. (Note: The Mining Projects falling under CRZ would also need to obtain approval of the concerned Coastal Zone Management Authority).

21) R&R Plan/compensation details for the Project Affected People (PAP) should be furnished. While preparing the R&R Plan, the relevant State/National Rehabilitation & Resettlement Policy should be kept in view. In respect of SCs /STs and other weaker sections of the society in the study area, a need based sample survey, family-wise, should be undertaken to assess their requirements, and action programmes prepared and submitted accordingly, integrating the sectoral programmes of line departments of the State Government. It may be clearly brought out whether the village(s) located in the mine lease area will be shifted or not. The issues relating to shifting of village(s) including their R&R and socio-economic aspects should be discussed in the Report.

22) One season (non-monsoon) [i.e. March-May (Summer Season); October-December (post monsoon season) ; December-February (winter season)]primary baseline data on ambient air quality as per CPCB Notification of 2009, water quality, noise level, soil and flora and fauna shall be collected and the AAQ and other data so compiled presented date-wise in the EIA and

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

23) Air quality modeling should be carried out for prediction of impact of the project on the air quality of the area. It should also take into account the impact of movement of Vehicles for transportation of mineral. The details of the model used and input parameters used for modeling should be provided. The air quality contours may be shown on a location map clearly indicating the location of the site, location of sensitive receptors, if any, and the habitation. The wind roses showing pre-dominant wind direction may also be indicated on the map.

24) The water requirement for the Project, its availability and source should be furnished. A detailed water balance should also be provided. Fresh water requirement for the Project should be indicated.

25) Necessary clearance from the Competent Authority for drawl of requisite quantity of water for the Project should be provided.

26) Description of water conservation measures proposed to be adopted in the Project should be given. Details of rainwater harvesting proposed in the Project, if any, should be provided.

27) Impact of the Project on the water quality, both surface and groundwater, should be assessed and necessary safeguard measures, if any required, should be provided.

28) Based on actual monitored data, it may clearly be shown whether working will intersect groundwater. Necessary data and documentation in this regard may be provided. In case the working will intersect groundwater table, a detailed Hydro Geological Study should be undertaken and Report furnished. The Report inter-alia, shall include details of the aquifers present and impact of mining activities on these aquifers. Necessary permission from Central Ground Water Authority for working below ground water and for pumping of ground water should also be obtained and copy furnished.

29) Details of any stream, seasonal or otherwise, passing through the lease area and modification / diversion proposed, if any, and the impact of the same on the hydrology should be brought out.

30) Information on site elevation, working depth, groundwater table etc. Should be provided both in AMSL and bgl. A schematic diagram may also be provided for the same.

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31) A time bound Progressive Greenbelt Development Plan shall be prepared in a tabular form (indicating the linear and quantitative coverage, plant species and time frame) and submitted, keeping in mind, the same will have to be executed up front on commencement of the Project. Phase-wise plan of plantation and compensatory afforestation should be charted clearly indicating the area to be covered under plantation and the species to be planted. The details of plantation already done should be given. The plant species selected for green belt should have greater ecological value and should be of good utility value to the local population with emphasis on local and native species and the species which are tolerant to pollution.

32) Impact on local transport infrastructure due to the Project should be indicated. Projected increase in truck traffic as a result of the Project in the present road network (including those outside the Project area) should be worked out, indicating whether it is capable of handling the incremental load. Arrangement for improving the infrastructure, if contemplated (including action to be taken by other agencies such as State Government) should be covered. Project Proponent shall conduct Impact of Transportation study as per Indian Road Congress Guidelines.

33) Details of the onsite shelter and facilities to be provided to the mine workers should be included in the EIA Report.

34) Conceptual post mining land use and Reclamation and Restoration of mined out areas (with plans and with adequate number of sections) should be given in the EIA report.

35) Occupational Health impacts of the Project should be anticipated and the proposed preventive measures spelt out in detail. Details of pre-placement medical examination and periodical medical examination schedules should be incorporated in the EMP. The project specific occupational health mitigation measures with required facilities proposed in the mining area may be detailed.

36) Public health implications of the Project and related activities for the population in the impact zone should be systematically evaluated and the proposed remedial measures should be detailed along with budgetary allocations.

37) Measures of socio economic significance and influence to the local community proposed to be provided by the Project Proponent should be indicated. As far as possible, quantitative dimensions may be given with time frames for implementation.

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38) Detailed Environmental Management Plan (EMP) to mitigate the environmental impacts which, should inter-alia include the impacts of change of land use, loss of agricultural and grazing land, if any, occupational health impacts besides other impacts specific to the proposed Project.

39) Public Hearing points raised and commitment of the Project Proponent on the same along with time bound Action Plan with budgetary provisions to implement the same should be provided and also incorporated in the final EIA/EMP Report of the Project.

40) Details of litigation pending against the project, if any, with direction /order passed by any Court of Law against the Project should be given.

41) The cost of the Project (capital cost and recurring cost) as well as the cost towards implementation of EMP should be clearly spelt out.

42) A Disaster management Plan shall be prepared and included in the EIA/EMP Report.

43) Benefits of the Project if the Project is implemented should be spelt out. The benefits of the Project shall clearly indicate environmental, social, economic, employment potential, etc.

44) Besides the above, the below mentioned general points are also to be followed:-

a) Executive Summary of the EIA/EMP Report

b) All documents to be properly referenced with index and continuous page numbering.

c) Where data are presented in the Report especially in Tables, the period in which the data were collected and the sources should be indicated.

d) Project Proponent shall enclose all the analysis/testing reports of water, air, soil, noise etc. using the MoEF&CC/NABL accredited laboratories. All the original analysis/testing reports should be available during appraisal of the Project.

e) Where the documents provided are in a language other than English, an English translation should be provided.

f) The Questionnaire for environmental appraisal of mining projects as devised earlier by the Ministry shall also be filled and submitted.

g) While preparing the EIA report, the instructions for the Proponents and instructions for the Consultants issued by MoEF&CC vide O.M. No. J-11013/41/2006-IA. II(I) dated 4th August, 2009, which are available on the website of this Ministry, should be followed.

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h) Changes, if any made in the basic scope and project parameters (as submitted in Form-I and the PFR for securing the TOR) should be brought to the attention of MoEF&CC with reasons for such changes and permission should be sought, as the ToR may also have to be altered. Post Public Hearing changes in structure and content of the draft EIA/EMP (other than modifications arising out of the P.H. process) will entail conducting the PH again with the revised documentation.

i) As per the circular no. J-11011/618/2010-IA. II(I) dated 30.5.2012, certified report of the status of compliance of the conditions stipulated in the Environment Clearance for the existing operations of the project, should be obtained from the Regional Office of Ministry of Environment, Forest and Climate Change, as may be applicable.

j) The EIA report should also include (i) surface plan of the area indicating contours of main topographic features, drainage and mining area, (ii) geological maps and sections and (iii) sections of the mine pit and external dumps, if any, clearly showing the land features of the adjoining area.

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

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

1. Project name and location (Village, District, State, Industrial Estate (if applicable).
2. Process description in brief, specifically indicating the gaseous emission, liquid effluent and solid and hazardous wastes.
3. Measures for mitigating the impact on the environment and mode of discharge or disposal.
4. Capital cost of the project, estimated time of completion.
5. The proponent shall furnish the contour map of the water table detailing the number of wells located around the site and impacts on the wells due to mining activity.
6. A detailed study of the lithology of the mining lease area shall be furnished.
7. Details of village map, "A" register and FMB sketch shall be furnished.
8. Detailed mining closure plan for the proposed project approved by the Geology of Mining department shall be shall be submitted along with EIA report.
9. Obtain a letter /certificate from the Assistant Director of Geology and Mining standing that there is no other Minerals/resources like sand in the quarrying area within the approved depth of mining and below depth of mining and the same shall be furnished in the EIA report.

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10. EIA report should strictly follow the Environmental Impact Assessment Guidance Manual for Mining of Minerals published February 2010.
11. Detail plan on rehabilitation and reclamation carried out for the stabilization and restoration of the mined areas.
12. The EIA study report shall include the surrounding mining activity, if any.
13. Modeling study for Air, Water and noise shall be carried out in this field and incremental increase in the above study shall be substantiated with mitigation measures.
14. A study on the geological resources available shall be carried out and reported.
15. A specific study on agriculture & livelihood shall be carried out and reported.
16. Impact of soil erosion, soil physical chemical and biological property changes may be assumed.
17. Site selected for the project - Nature of land - Agricultural (single/double crop), barren, Govt./ private land, status of is acquisition, nearby (in 2-3 km.) water body, population, with in 10km other industries, forest , eco-sensitive zones, accessibility, (note - in case of industrial estate this information may not be necessary)
18. Baseline environmental data - air quality, surface and ground water quality, soil characteristic, flora and fauna, socio-economic condition of the nearby population
19. Identification of hazards in handling, processing and storage of hazardous material and safety system provided to mitigate the risk.
20. Likely impact of the project on air, water, land, flora-fauna and nearby population
21. Emergency preparedness plan in case of natural or in plant emergencies
22. Issues raised during public hearing (if applicable) and response given
23. CER plan with proposed expenditure.
24. Occupational Health Measures
25. Post project monitoring plan
26. The project proponent shall carry out detailed hydro geological study through intuitions/NABET Accredited agencies.
27. A detailed report on the green belt development already undertaken is to be furnished and also submit the proposal for green belt activities.
28. The proponent shall propose the suitable control measure to control the fugitive emissions during the operations of the mines.
29. A specific study should include impact on flora & fauna, disturbance to migratory pattern of animals.

MEMBER SECRETARY
SEIAA-TN

30. Reserve funds should be earmarked for proper closure plan.
31. A detailed plan on plastic waste management shall be furnished. Further, the proponent should strictly comply with, Tamil Nadu Government Order (Ms) No.84 Environment and forests (EC.2) Department dated 25.06.2018 regarding ban on one time use and throw away plastics irrespective of thickness with effect from 01.01.2019 under Environment (Protection) Act, 1986. In this connection, the project proponent has to furnish the action plan.

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

a. A note confirming compliance of the TOR, with cross referencing of the relevant sections / pages of the EIA report should be provided.
b. All documents may be properly referenced with index, page numbers and continuous page numbering.
c. Where data are presented in the report especially in tables, the period in which the data were collected and the sources should be indicated.
d. While preparing the EIA report, the instructions for the proponents and instructions for the consultants issued by MoEF & CC vide O.M. No. J-11013/41/2006-IA.II (I) dated 4th August, 2009, which are available on the website of this Ministry should also be followed.
e. The consultants involved in the preparation of EIA/EMP report after accreditation with Quality Council of India (QCI)/National Accreditation Board of Education and Training (NABET) would need to include a certificate in this regard in the EIA/EMP reports prepared by them and data provided by other organization/Laboratories including their status of approvals etc. In this regard circular no F. No.J -11013/77/2004-IA-II(I) dated 2nd December, 2009, 18th March 2010, 28th May 2010, 28th June 2010, 31st December 2010 & 30th September 2011 posted on the Ministry's website http://www.moef.nic.in/ may be referred.
    - After preparing the EIA (as per the generic structure prescribed in Appendix-III of the EIA Notification, 2006) covering the above mentioned points, the proponent willtake further necessary action for obtaining environmental clearance in accordance with the procedure prescribed under the EIA Notification, 2006.
    - The final EIA report shall be submitted to the SEIAA, Tamil Nadu for obtaining Environmental Clearance.

MEMBER SECRETARY
SEIAA-TN

- 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.

MEMBER SECRETARY
SEIAA-TN

Copy to:

1. The Additional Chief Secretary to Government, Environment & Forests Department, Govt. of Tamil Nadu, Fort St. George, Chennai - 9
2. The Chairman, Central Pollution Control Board, Parivesh Bhavan,CBD Cum-Office Complex, East Arjun Nagar, New Delhi 110032.
3. The Member Secretary, Tamil Nadu Pollution Control Board,76, Mount Salai, Guindy, Chennai-600 032.
4. The APCCF (C), Regional Office, MoEF & CC (SZ), 34, HEPC Building, 1st & 2nd Floor, Cathedral Garden Road, Nungambakkam, Chennai -34.
5. Monitoring Cell, IA Division, Ministry of Environment, Forests & CC, Paryavaran Bhavan, CGO Complex, New Delhi 110003
6. The District Collector, Vellore District.
7. Stock File.

ANNEXURE-2

Rc.No.71/2022(Mines) Date : 28.12.2022

O/o. The Assistant Director
Department of Geology and Mining
Collectorate,
Vellore District.

PRECISE AREA COMMUNICATION LETTER

Sub: Mines and Minerals – Minor Mineral – Vellore District – Anaicut Taluk – Karadikudi Village – SF.Nos.253/7, 259/5, 259/2 & 259/4 – Extent of 2.31.50 of patta lands – Quarry lease application preferred by Thiru.R.Natarajan for Quarrying Roughstone and Gravel - Recommendations received – Precise Area Communicated – Reg.

Ref: 1) Quarry lease application preferred by Thiru.R.Natarajan, dated: 13.05.2022.

2) The Revenue Divisional Officer, Vellore report Rc.No.A4/2576/2022 dated: 16.07.2022.

3) Inspection report of the Assistant Director of Geology and Mining, Vellore dated: 16.11.2022.

4) G.O.(MS)No.169 Industries(MMC.1) Department, dated 04.08.2020.

****

One Thiru.R.Natarajan S/o.Rangasamy, No.147, Ayyagoundarpatti, Kollamangalam Village, Gudiyatham Taluk, Vellore District applied for grant of lease for quarrying Roughstone and Gravel over an extent of 2.31.50 hectares of patta lands in SF.Nos.253/7, 259/5, 259/2 & 259/4 of Karadikudi Village, Anaicut Taluk, Vellore District for a period of 5 years under Rule 19 & 20 of Tamil Nadu Minor Mineral Concession Rules, 1959.

2) The Revenue Divisional Officer, Vellore has recommended for grant of quarry lease in the subject area and the Assistant Director, Geology and Mining, Vellore has also recommended for grant of quarry lease for quarrying rough stone and gravel over an extent of 2.31.50 hectares of patta lands in SF.Nos.253/7, 259/5, 259/2 & 259/4 of Karadikudi Village, Anaicut Taluk, Vellore District subject to certain conditions.

O/o. ASSISTANT DIRECTOR GEOLOGY & MINING VELLORE

In view of the above, based on the recommendations of the Revenue Divisional Officer, Vellore and Geological field observations of the Assistant Director of Geology and Mining, an extent of 2.31.50 hectars of patta land in SF.Nos.253/7, 259/5, 259/2 & 259/4 of Karadikudi Village, Anaicut Taluk, Vellore District is hereby fixed as precise area and communicated to the applicant as per the powers conferred under Rule 41(4) of Tamil Nadu Minor Mineral Concession Rule as amended vide G.O.169 Industries (MS) Department, dated 04.08.2020 for grant of lease for quarrying Roughstone & Gravel in favour of Thiru.R.Natarajan for a period of 5 years under Rule 19 & 20 of Tamil Nadu Minor Mineral Concession Rules, 1959 subject to the following conditions.

Conditions

1. 7.5 meters safety distance should be left out for the adjacent patta lands.
2. 10 meters safety distance should be left out for the adjacent Government Poramboke lands.
3. The applicant shall not make any hindrance to the adjacent lands and public.
4. Quarrying should be restricted in the lease granted area only and barbed wire fencing should be erected all along the boundary of the lease granted area before commencement of quarrying operation.
5. Blasting of rock should be done by the short fire method with less explosives in between 12.00 Noon to 2.00 P.M., after giving Proper signal by siren as per the provisions of Indian Explosives Act, 1884.
6. Quarrying should be carried out in scientific and systematic manner.

The applicant Thiru.R.Natarajan is directed to submit the Mining plan within 90 days to the Assistant Director of Geology and Mining, Vellore for approval and also to submit Environmental Clearance issued by State Environmental Impact Assessment Authority (SEIAA) as required under Rule 41 & 42 of Tamil Nadu Minor Mineral Concession Rules, 1959 for the above area for further process.

Assistant Director,
Geology and mining,
Vellore.

To:

Thiru.R.Natarajan,
S/o.Rangasamy,
No.147, Ayyagoundarpatti,
Kollamangalam Village,
Gudiyatham Taluk,
Vellore District.

Copy to

1.The Chairman,
SEIAA,3rd Floor, Panagal Maaligai,
No.1, Jeenis Road, Saidapet,
Chennai-15.

2.The Commissioner of
Geology and Mining,
Guindy, Chennai-32.

ANNEXURE-3

From

Thiru D.Bernard. M.Sc.,
Assistant Director,
Dept.of Geology and Mining,
Vellore District.

To

Thiru.R.Natarajan,
S/o.Rangasamy,
No.147, Ayyagoundarpatti,
Kollamangalam Village,
Gudiyatham Taluk,
Vellore District.

Rc.No.71/2022(Mines) Dated: 13 .01.2023

Sir,

Sub: Mines and Minerals – Minor Minerals – Roughstone and Gravel – Vellore District - Anaicut Taluk - Karadikudi Village - SF.Nos.253/7, 259/5, 259/2 and 259/4 – OAE of 2.31.50 Hect – Quarry lease application preferred by Thiru.R.Natarajan - Precise area communicated - Draft Mining plan submitted - Approved – Regarding.

Ref: 1. Application of Thiru.R.Natarajan dated: 13.05.2022.

2. This office Precise area communication letter Rc.No. 71/2022 (Mines) dated 28.12.2022.

3. The applicant letter dated 18.01.2023.

****

In the reference first cited, Thiru.R.Natarajan S/o.Rangasamy, No.147, Ayyagoundarpatti, Kollamangalam Village, Gudiyatham Taluk, Vellore District has applied for grant of quarry lease for quarrying 'Rough stone & Gravel' over an extent 2.31.50 Hects of patta land in SF.Nos.253/7, 259/5, 259/2 & 259/4 of Karadikudi Village, Anaicut Taluk, Vellore District under the provisions of Rule 19 & 20 of Tamil Nadu Minor Mineral Concession Rules, 1959.

2) In the reference letter second cited, the Assistant Director, Geology and Mining, Vellore has communicated "Precise Area" for the proposal based on the recommendations of the Revenue Divisional Officer, Vellore field observation under Rule 41 of Tamil Nadu Minor Mineral Concession Rules, 1959 with the direction to the applicant to submit approved Mining plan and Environmental Clearance.

3) In the reference third cited, the applicant has submitted three copies of draft Mining plan prepared by the qualified person for approval. The draft Mining plan has been examined and verified with reference to the provisions laid down in Rule 36 and 41 of Tamil Nadu Minor Mineral concession Rules and the guidelines issued by the Commission of Geology and Mining vide letter Rc.No. 3868/LC/2012 dated. 19.11.2012 & 07.11.2014.

4) **The scrutiny remarks on the draft Mining Plan are furnished below.**

a. The Rough Stone & Gravel quarry has been planned to be operated for a period of five years.

b. The Geological reserve in the subject area is assessed as 5,35,500 cubic meter of Rough Stone and 50,134 cubic meter of Gravel.

c. The Mineable reserve is computed as 2,08,760 cubic meter of Rough Stone and 34,184 cubic meter of Gravel upto a depth of 32 m (17m above ground level and 15 m below ground level).

d. Machineries like tractor mounted compressor attached with jack hammers, excavators are proposed for quarrying operation.

e. Water table level in the area applied is in between 50m and 47m during a year.

f. As per the Rule 111 of Metelliferous Mining Regulations 1961, the boundary barrier Zone of 7.5 meters is ear-marked as neutral zone.

g. The plates including Satellite image (1:10,000), Toposketch of quarry lease applied area for 10Km Radius (1:1,00,000), Quarry lease & Surface plan (1:1,000), Conceptual plan and sections (1:1000) & Sections Hor–(1:1000) Ver–(1:500) Topography, Geological & year wise development & production plan & sections (1: 1000) & Sections Hor–(1:1000) Ver–(1:500) and Environmental plan (1:10,000) were verified with reference to the field evidences.

h. The stipulations made in rule 36 of the Tamil Nadu Minor Mineral Concession Rules, 1959 are adhered in the draft Mining plan.

i. The draft Mining plan is submitted within the prescribed time limit of 90 days from the date of receipt of the precise area communication letter.

In view of the above, as per the powers laid down in rule 41 of the Tamil Nadu Minor Mineral Concession Rules, 1959, the draft mining plan submitted by the applicant Thiru.R.Natarajan S/o.Rangasamy, No.147, Ayya-goundarpatti, Kollamangalam Village, Gudiyatham Taluk, Vellore District in respect of proposed Rough Stone & Gravel quarry (Minor Mineral) over an extent 2.31.50 Hects patta land in SF.Nos.253/7, 259/5, 259/2 & 259/4 of Karadikudi Village, Anaicut Taluk, Vellore District is hereby approved subject to the following conditions and stipulations made in the governing Act and Rules.

The Mining plan is approved without prejudice to any other Law applicable to the quarry lease from time to time.

i) The approval of the Mining plan does not in any way imply the approval of the Government in terms of any other provisions of the Tamil Nadu Minor Mineral Concession Rules, 1959.

ii) The Mining plan is approved without prejudice to any of the orders or directions from any legal forums.

iii) Quarrying shall be carried out scrupulously as per the Approved Mining plan.

Encl: 2 copies of Approved Mining Plan.

12/01/23

Assistant Director,
Geology and Mining,
Vellore.

Copy submitted to:

The Chairman,
State Level Environment Impact
Assessment Authority,
3rd Floor, Panagal Maaligai,
No.1 Jeenis Road, Saidapet,
Chennai-15.

13/1/23

APPROVAL MINING PLAN

MINING PLAN FOR KARADIKUDI ROUGH STONE AND GRAVEL QUARRY

(Prepared under rule 19(1), 41 & 42 of
Tamil Nadu Minor Mineral Concession Rules, 1959)

LOCATION OF THE QUARRY LEASE APPLIED AREA

STATE	:	TAMIL NADU
DISTRICT	:	VELLORE
TALUK	:	ANAICUT
VILLAGE	:	KARADIKUDI
S.F.NOS	:	253/7, 259/5, 259/2 AND 259/4
EXTENT	:	2.31.50Ha

ECO-FRIENDLY



SUSTAINABILITY



SAFETY



FOR APPLICANT

THIRU.R.NATARAJAN,
S/o.Rangasamy,
No.147, Ayyagoundarpatti,
Kollamangalam Village,
Gudiyatham Taluk,
Vellore District.

PREPARED BY

C.Natarajan, M.Sc.,M.Phil.,
Qualified Person
No.93/36E2, Subramaniyar Kovil Street,
Omalur Taluk, Salem District, Tamil Nadu,
Pin code-636 455.
MOBILE: 97502 23535 & 94446 54520.



(PPE)

R.Natarajan,
S/o.Rangasamy,
No.147, Ayyagoundarpatti,
Kollamangalam Village,
Gudiyatham Taluk,
Vellore District.

CONSENT LETTER FROM THE APPLICANT

The Mining Plan in respect of **Rough Stone and Gravel** quarry over an extent of 2.31.50hectares of Patta lands in S.F.Nos.253/7, 259/5, 259/2 and 259/4 of Karadikudi Village, Anaicut Taluk, Vellore District, Tamil Nadu State has been prepared by

C.Natarajan, M.Sc.,M.Phil.,

Qualified Person

I request the Assistant Director, Department of Geology and Mining, Vellore District to make further correspondence regarding modifications of the Mining Plan with the said Qualified Person on this following address.

C.Natarajan, M.Sc.,M.Phil.,

Qualified Person

No.93/36E2,Subramaniyar Kovil Street,
Omalur Taluk, Salem District,
Tamil Nadu, Pin code-636 455.
Mobile:97502 23535 & 94446 54520.

I hereby undertake that all modifications so made in the Mining Plan by the Qualified Person may be deemed to have been made with my knowledge and consent and shall be acceptable to me and building on me in all respects.

Signature of the Applicant

R.Natarajan

Place: Vellore
Date: 29.12.2022

R.Natarajan,
S/o.Rangasamy,
No.147, Ayyagoundarpatti,
Kollamangalam Village,
Gudiyatham Taluk,
Vellore District.

DECLARATION

The Mining Plan in respect of **Rough Stone and Gravel** quarry over an extent of 2.31.50hectares of Patta lands in S.F.Nos.253/7, 259/5, 259/2 and 259/4 of Karadikudi Village, Anaicut Taluk, Vellore District, Tamil Nadu State has been prepared with my consultation and I have understood the contents and agree to implement the same in accordance with the Mining Laws.

Signature of the Applicant

R.Natarajan

Place: Vellore
Date: 29.12.2022

C.Natarajan, M.Sc.,M.Phil.,
Qualified Person
No.93/36E2,Subramaniyar Kovil Street,
Omalur Taluk, Salem District,
Tamil Nadu, Pin code-636 455.
Mobile:97502 23535 & 94446 54520.

O/o. ASSISTANT DIRECTOR VELLORE GEOLOGY & MINING

CERTIFICATE

This is to certify that, the provisions of Minor Minerals Conservation and Development Rules, 2010 (MMCDR) have been observed in the Mining Plan for the grant of **Rough Stone and Gravel** quarry lease over an extent of 2.31.50hectares of Patta lands in S.F.Nos.253/7, 259/5, 259/2 and 259/4 of Karadikudi Village, Anaicut Taluk, Vellore District, Tamil Nadu State applied by Thiru.R.Natarajan, for fresh quarry lease.

Wherever specific permission / exemptions / relaxations or approvals are required, the applicant will approach the concerned authorities of State and Central Governments for granting such permissions etc.

Certified
Signature of Qualified Person.

C.Natarajan, M.Sc.,M.Phil.,
Qualified Person

C.NATARAJAN M.Sc.,M.Phil.,
Qualified Person

Place: Salem
Date: 30.12.2022

C.Natarajan, M.Sc.,M.Phil.,
Qualified Person
No.93/36E2,Subramaniyar Kovil Street,
Omalur Taluk, Salem District,
Tamil Nadu, Pin code-636 455.
Mobile:97502 23535 & 94446 54520.

ASSISTANT DIRECTOR VELLORE GEOLOGY & MINING

CERTIFICATE

Certified that, in preparation of Mining Plan for **Rough Stone and Gravel** quarry over an extent of 2.31.50hectares of Patta lands in S.F.Nos.253/7, 259/5, 259/2 and 259/4 of Karadikudi Village, Anaicut Taluk, Vellore District, Tamil Nadu State for Thiru.R.Natarajan covers all the provisions of Mines Act, Rules, and Regulations etc made there under and whenever specific permission are required, the applicant will approach the Director General of Mines Safety, Chennai. The standards prescribed by DGMS in respect of Mines Health will be strictly implemented.

Certified

Signature of Qualified Person.

C.Natarajan, M.Sc.,M.Phil.,
Qualified Person

C.NATARAJAN M.Sc.,M.Phil.,
Qualified Person

Place : Salem
Date : 30.12.2022



CERTIFICATE

Certified that I, C.Natarajan, residing at No.93/36 E2, Subramaniyar Kovil Street, Omalur Taluk, Salem District, Tamil Nadu, Pin Code-636 455. I am a Post graduate in Geology (M.Sc., Geology) from Annamalai university and more than five years of experience in mining Field.

Rule 15(1)(a) and (b) of Minerals (Other than Atomic, Hydro Carbons Energy Minerals) concession Rules 2016 stipulates the eligibility for preparing Mining Plans as *"(1)(a) a post graduate degree in Geology granted by a university established" and (1)(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 (1)(a) and (1)(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 in respect of Rough Stone and Gravel quarry lease applied for an extent of 2.31.50Ha of (Patta lands) in S.F.Nos. 253/7, 259/5, 259/2 and 259/4 of Karadikudi Village, Anaicut Taluk, Vellore District, by Thiru. R.Natarajan, for a period of Ten Years. Since the Mining Plan is prepared as per the provisions contained in Rule 15(1) (a) and (b) of Minerals (Other than Atomic, Hydro Carbons Energy Minerals) concession Rules 2016, the same may be approved by the Competent Authority.

C.Natarajan, M.Sc.,M.Phil.,
Qualified Person

C.NATARAJAN M.Sc.,M.Phil.,
Qualified Person

Place : Salem
Date : 30.12.2022

ASSISTANT DIRECTOR
O/O
VELLORE
GEOLOGY & MINING

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O/O. ASSISTANT DIRECTOR VELLORE & MINING

Annexure

S. No.	Description	Annexure No.
1.0	Precise Area Communication letter issued by the District Collector	I
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LIST OF PLATES

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3.0	Satellite imagery map	I-B
4.0	Topo sketch of Quarry lease applied area for 10Km Radius	I-C
5.0	Key Plan	I-D
6.0	Quarry lease & Surface plan	II
7.0	Topography, Geological, Year wise Development and Production Plan & Section	III
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9.0	Conceptual Plan & Section	V

O/o. ASSISTANT DIRECTOR VELLORE GEOLOGY & MINING

MINING PLAN FOR MINOR MINERALS

ROUGH STONE AND GRAVEL

Over an extent of 2.31.50hectares of Patta land in S.F.Nos. 253/7, 259/5, 259/2 and 259/4 of Karadikudi Village, Anaicut Taluk, Vellore District, Tamil Nadu State.

(PREPARED UNDER RULE 19(1), 41 and 42 OF TNMMCR 1959)

1.0 Introduction and Executive Summary;

1. The present Mining Plan is prepared for Thiru.R.Natarajan, S/o.Rangasamy, residing no.147, Ayyagoundarpatti, Kollamangalam Village, Gudiyatham Taluk, Vellore District.
2. The application was processed by the Assistant Director, Department of Geology and Mining, Vellore, and passed an order vide Rc.No.71/2022(Mines) dated 28.12.2022 directing the applicant to produce approved Mining Plan under Rule 41(5) of the Tamil Nadu Minor Mineral Concession Rules, 1959 and Environmental Clearance Certificate under Rule 42 from the State Level Environmental Impact Assessment Authority (SEIAA) for the grant of quarry lease to quarry **Rough Stone and Gravel** over an extent of 2.31.50 hectares of Patta lands in S.F.Nos. 253/7, 259/5, 259/2 and 259/4 of Karadikudi Village, Anaicut Taluk, Vellore District of Tamil Nadu State for a period of ten years.
3. Accordingly, Mining Plan is prepared under the provisions of rule 19(1), 41 and 42 as per the amendments under Tamil Nadu Minor Mineral Concession Rules, 1959 by incorporating following the conditions imposed in the precise area communication letter.
   a) 7.5 meters safety distance should be left out for the adjacent patta lands.
   b) 10m safety distance should be left out for adjacent Government Poramboke lands.
   c) The applicant shall not make any hindrance to the adjacent lands and public.
   d) Quarrying should be restricted in the lease granted area only and barbed wire fencing should be erected all along the boundary of the lease granted area before commencement of quarrying operation.

e) Blasting of rock should be done by the short fire method with less explosive in between 12.00Noon to 2.00P.M., after giving Proper signal by siren as per the provisions of Indian Explosives Act, 1884.

f) Quarrying should be carried out in scientific and systematic manner.

4. Geological Resources is estimated at 5,35,500m³ of Rough stone, 50,134m³ of gravel formation and Mineable Reserves is estimated at 2,08,760m³ of Rough Stone, 34,184m³ of gravel formation and after leaving necessary safety distance from the lease boundary as indicated in the precise area letter and relevant mining laws in force.

5. Production Schedule is proposed production of 2,08,760m³ of Rough Stone, 34,184m³ of gravel formation for the period of five years.

6. The applicant ensured that, child labours under 18 years of age will not be engaged for quarrying operation.

7. The applicant ensure that will appoint should have valid certified persons (Mines Manager, Foreman, Mate) during quarrying operation.

8. Environmental parameters,

   i) The area does not attract the Forest Conservation Act, 1980 as there is no forest around 811m radius.

   ii) There is no interstate boundary around 10Kms radius.

   iii) There is no wild life animal sanctuary within 10Kms radius from the project site area under the Wildlife (Protection) Act, 1972.

   Therefore the project seeks clearance only from State Level Environmental Impact Assessment Authority (SEIAA) under B2 Category.

O/o. ASSISTANT DIRECTOR * VELLORE * GEOLOGY & MINING

9. Environmental measures to be adopted shall be,

i) Dust Control at source while drilling and blasting,

ii) Dust suppression at loading point and transport haul roads,

iii) Noise Control in blasting, control of fly rock missiles and vibration by doing peak particle velocity with in standard as prescribed by the DGMS and MOEF.

iv) Unnecessary land degradation should be avoided or damaged land should be reclaimed or rehabilitated.

v) Avoid uneven rat hole mining and follow scientific and systematic mining by safe bench system of open cast mining.

vi) Mining near major fracture zones if any should be avoided to control ground water fluctuation in the adjacent agricultural lands.

vii) Emission test of vehicles should be in tack to maintain minimum emission level of flue gases.

viii) Noise level should not exceed 80db and the vehicles should use only permitted Air Horn while on road near residential areas.

ix) Safety zones as prescribed by the Department of Geology and Mining from adjacent infrastructures should be strictly adhere to.

x) And any other conditions as stipulated by the concerned authorities should be followed to protect the environment.

O/o ASSISTANT DIRECTOR VELLORE GEOLOGY & MINING

EXECUTIVE SUMMARY:

a.	Name of the Village Panchayat	:	Karadikudi
b.	Name of the Panchayat Union	:	Anaicut
c.	The proposed total Minable Reserves	:	2,08,760m^3 of Rough Stone, 34,184m^3 of gravel formation
d.	The proposed quantity of reserves (level of production) for Five years to be mined is(Recoverable reserves)	:	2,08,760m^3 of Rough Stone, 34,184m^3 of gravel formation
e.	Total extent of the area	:	2.31.50Ha
f.	Proposed Period of mining	:	Five Years
g.	Existing depth	:	It is fresh quarry lease applied area
h.	Proposed Depth of mining	:	32m (17m above ground level and 15m Below ground level) for the proposed mining plan.
i.	Method of mining/level of mechanization	:	Opencast, Semi-mechanized Mining with a bench height of 5m and bench width of 5m and 80^0 Slope is proposed.
j.	Types of Machineries used in the quarry	:	Machineries like Tractor mounted compressor attached with Jack hammers, Excavators are proposed to deploy for quarrying operation.
k.	Cost of the Project A. Fixed Assets Cost B. Operational Cost C. EMP Cost		Rs. 16,89,000/- Rs. 51,50,000/- Rs. 4,70,000/- Total Project cost(A+B+C)=**Rs. 73,09,000/-**
l.	The area applied for lease is bounded by twelve corners and the coordinates are clearly marked in plate no II.		

Corners	Co- ordinates		Distance between the corners
	Latitude	Longitude	
1	12° 50' 40.73"N	78° 56' 07.82"E	1-2 = 116.0m
2	12° 50' 44.47"N	78° 56' 07.29"E	2-3 = 13.2m
3	12° 50' 44.36"N	78° 56' 07.72"E	3-4 = 83.6m
4	12° 50' 47.04"N	78° 56' 07.22"E	4-5 = 45.0m
5	12° 50' 48.14"N	78° 56' 08.20"E	5-6 = 42.2m



	6	12° 50' 49.50"N	78° 56' 08.01"E	6-7	=	34.0m
	7	12° 50' 49.12"N	78° 56' 09.07"E	7-8	=	100.2m
	8	12° 50' 45.87"N	78° 56' 09.32"E	8-9	=	117.4m
	9	12° 50' 45.64"N	78° 56' 13.19"E	9-10	=	108.6m
	10	12° 50' 42.50"N	78° 56' 14.85"E	10-11	=	173.6m
	11	12° 50' 43.98"N	78° 56' 09.31"E	11-12	=	105.6m
	12	12° 50' 40.55"N	78° 56' 09.12"E	12-1	=	39.8m

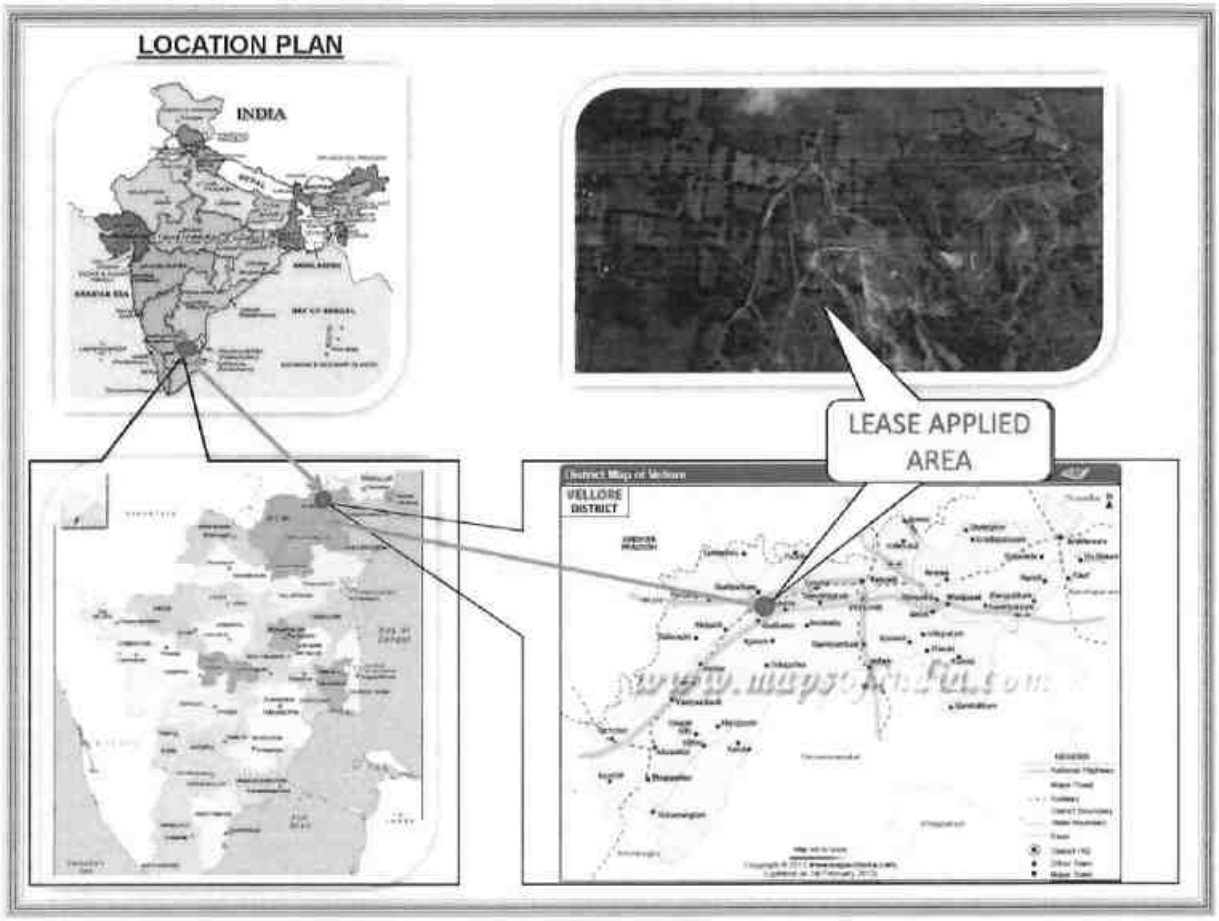
2.0 General Information:

2.1	a.	Name of the Applicant	:	Thiru.R.Natarajan,
	b.	Address of the Applicant with phone No and e-mail id if any	:	S/o.Rangasamy, No.147, Ayyagoundarpatti, Kollamangalam Village, Gudiyatham Taluk, Vellore District. Pin Code–635809 Cell No.:9344755509
	c.	Status of the Applicant	:	Individual
2.2	a.	Mineral Which the applicant intends to mine	:	Rough Stone and Gravel.
	b.	Precise area communication letter No.	:	Precise area communication letter received from the Assistant Director, Department of Geology and Mining, Vellore, Rc.No.71/2022(Mines) dated 28.12.2022
	c.	Period of permission / lease granted	:	The Assistant Director, Department of Geology and Mining, Vellore, has grant of lease period for **ten years.**
	d.	Name and Address of the QP preparing Mining Plan	:	**C.Natarajan, M.Sc.,M.Phil.,** **Qualified Person** No.93/36E2, Subramaniyar Kovil Street, Omalur Taluk, Salem District, Tamil Nadu, Pin-636 455. Mobile: 97502 23535 & 94446 54520.

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3.0 Location:

S.No		Details of the Area:
1	Corner Coordinates	Latitude : 12°50'40.55"N to 12°50'49.50"N Longitude : 78°56'07.22"E to 78°56'14.85"E
2	Toposheet Number	57- L/13
3	The altitude of the area	321m (MSL)
4	Extent	2.31.50Ha
5	Survey Nos	253/7, 259/5, 259/2 and 259/4
6	Village	Karadikudi
7	Taluk	Anaicut
8	District	Vellore
9	State	Tamil Nadu



a.	Classification of the Area (Ryotwari / poramboke / others)	:	Patta land
b.	Ownership / Occupancy of the Applied area (Surface rights)	:	It is patta land registered in the name of applicant vide patta no.757 & 943, Please refer Annexure No: IV.
c.	Toposheet No. with Latitude and Longitude	: : :	Topo Sheet No: 57L/ 13 Latitude : 12°50'40.55"N to 12°50'49.50"N Longitude : 78°56'07.22"E to 78°56'14.85"E
d.	Existence of Public Road / Railway line if any nearby the area and approximate distance	:	There is an existing road from the area leads to Tirupathur - Vellore road on northern side of the area. The Nearest Railway line is Salem– Vellore line which is about 10.5Km on Northwestern side of the area.



SATELLITE IMAGERY OF THE LEASE APPLIED AREA

Fig. Location of the lease Applied Area

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PART - A

4.0 Geology and Mineral Reserves:

4.1	a.	Topography	:	➢ The area applied for quarry lease is exhibits hilly terrain covered by Gravel formation. The massive Charnockite formation is noticed below 2m (Avg) Gravel formation and sloping towards Northern side of the area, the altitude of the area is above 321m (maximum) from MSL. ➢ No major river is found nearby the lease applied area. ➢ Water table is found at a depth of 50m in summer and 47m in rainy seasons. ➢ Temperature of the area is reported to be 18°C to a maximum of 42°C during summer. ➢ Rainfall of this area is about 800mm to 900 mm during the both NE & SW monsoons.
	b.	General Geology of the Area	:	The area is underlain by the wide range of metamorphic rocks of peninsular gneissic complex. These rocks are extensively weathered and overlain by the recent valley fills and alluvium at places. The geological formations found in the district are Archaean rocks like Gneisses, Granites, Charnockites basic granulites and calc-gneisses. The younger formations are Quartz veins and pegmatite. The rock type noticed in the area for lease is Charnockite which contains mostly Quartz and Feldspar with some ferromagnesian minerals. The Charnockite is part of peninsular Gneisses, a high grade metamorphic rock. The strike of the Charnockite formation is N50°E -S50°W with dipping towards SE60°. The general geological succession of the area is given as under.

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				AGE	**ROCK TYPE**
				Recent -	Reddish and gravelly soil
				Unconformity	
				Archaean -	Dolerite dyke Charnockite. Peninsular Gneissic complex and Calc Gneiss
4.2		Details of Exploration already carried out if any	:	No exploration was carried out, as the Rough stone formations are clearly visible from adjacent existing quarry pit.	
4.3	a.	Estimation of Reserves	:	The Geological and Recoverable reserves are estimated by cross sectional method. Totally three sections have been drawn, two sections drawn length wise as (X-Y), (X1-Y1) and another one section drawn width wise as (A-B), to cover maximum area considered for lease. The Plans and Sections have been drawn with a scale of 1:1000 and 1:500 respectively. Please refer plate No.III.	

a. Geological Resources

The quarrying is restricted up to a depth of 32m (17m above ground level and 15m Below ground level) only. Availability of Resources is given below.

Table No-1

Section	Topography	Bench	Length in (m)	Width in (m)	Depth in (m)	Volume in m^3	Gravel formation in m^3	Geological Resources of Rough stone in m^3
XY-AB	Above Ground level	I	77	139	2	21406	21406	
		II	40	135	5	27000		27000
		III	54	138	5	37260		37260
		IV	71	138	5	48990		48990
	Below Ground level	V	71	138	5	48990		48990
		VI	71	138	5	48990		48990
		VII	71	138	5	48990		48990
Total							**21406**	**260220**

X1Y1-AB	Above Ground level	I	266	54	2	28728	28728	
		II	156	26	5	20280		20280
		III	208	51	5	53040		53040
	Below Ground level	IV	264	51	5	67320		67320
		V	264	51	5	67320		67320
		VI	264	51	5	67320		67320
Total							**28728**	**275280**
Grand total							**50134**	**535500**

Gravel Formation : 50,134m³

The Geological Resources of Rough stone : 5,35,500m³

b. Mineable Reserve

The mineable reserve calculated by deducting 7.5m and 50m safety distance and bench loss.

Table No-2

Section	Topography	Bench	Length in (m)	Width in (m)	Depth in (m)	Volume in m³	Gravel formation in m³	Mineable Reserves of Rough stone in m³
XY-AB	Above Ground level	I	62	131	2	16244	16244	
		II	30	125	5	18750		18750
		III	37	121	5	22385		22385
		IV	38	114	5	21660		21660
	Below Ground level	V	25	108	5	13500		13500
		VI	12	101	5	6060		6060
Total							**16244**	**82355**
X1Y1-AB	Above Ground level	I	195	46	2	17940	17940	
		II	146	26	5	18980		18980
		III	184	42	5	38640		38640
	Below Ground level	IV	171	35	5	29925		29925
		V	158	29	5	22910		22910
		VI	145	22	5	15950		15950
Total							**17940**	**126405**
Grand total							**34184**	**208760**

The mineable reserve is computed as 2,08,760m³ of Rough stone, 34,184m³ of Gravel formation upto a depth of 32m (17m above ground level and 15m Below ground level) only.

5.0	**Mining**:		
5.1	Method of Mining	:	1. Opencast method of semi mechanized mining with 5.0m height 5m width and 80° slope of the bench. 2. However, as far as the quarrying of Rough stone is concerned, observance of the provisions of Regulation 106(2) (b) as above is seldom possible due to various inherent petrogenetic factors coupled with mining difficulties. Hence it is proposed to obtain relaxation to the provisions of the above regulation from the Director of mines safety for which necessary provision is available with the regulation 106 (2) (b) of MMR-1961, under Mine Act-1952.
5.2	Mode of Working	:	The rough stone is proposed to quarry 5m bench height, 5m width with 800 slope and with conventional opencast semi-Mechanized method. The quarry operation involves shallow jack hammer drilling, slurry blasting, excavation, Loading and transportation of Rough stone to the needy buyers. 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 jackhammer drilling and blasting, hydraulic excavators are used for loading the Rough Stone from pithead to the needy buyers. 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 semi mechanized method of mining.
5.3	Proposed bench height & Width	:	Quarrying of Rough Stone is proposed bench height of 5m and bench width of 5m.
5.4	Details of Overburden / Mineral Production proposed for the first 5 years.	:	The overburden in the form of Gravel, after the excavation of Gravel and Rough stone will be directly loaded into tipper to the needy crushers/other buyers for road project and construction works for filling and leveling of low lying areas.



The Yearwise Production and Development Table

Table No –3

Year	Section	Topography	Bench	Length in (m)	Width in (m)	Depth in (m)	Volume in m^3	Gravel in m^3	Mineable reserve of Rough stone in m^3
I	XY-AB	Above Ground level	I	62	131	2	16244	16244	
			II	30	125	5	18750		18750
			III	37	121	5	22385		22385
Total								**16244**	**41135**
II	X1Y1-AB	Above Ground level	I	195	46	2	17940	17940	
			II	146	26	5	18980		18980
			III	110	42	5	23100		23100
Total								**17940**	**42080**
III	X1Y1-AB	Above Ground level	III	74	42	5	15540		15540
	XY-AB		IV	38	114	5	21660		21660
		Below Ground level	V	10	108	5	5400		5400
Total									**42600**
IV	XY-AB	Below Ground level	V	15	108	5	8100		8100
	X1Y1-AB	Below Ground level	IV	171	35	5	29925		29925
			V	23	29	5	3335		3335
Total									**41360**
V	X1Y1-AB	Below Ground level	V	135	29	5	19575		19575
			VI	145	22	5	15950		15950
	XY-AB		VI	12	101	5	6060		6060
Total									**41585**
Grand total								**34184**	**208760**

The applicant has proposed to carry out 2,08,760m^3 of Rough stone 34,184m^3 of Gravel formation at the rate of 100% recovery upto a depth of 32m (17m above ground level and 15m Below ground level) for the period of five years.

5.5 Machineries to be used :

a. Drilling : It is proposed to use following machineries for quarrying rough stone

S.No	Type	Nos	Dia Hole mm	Size Capacity	Make	Motive power
1	Jack hammer	6	32	1.2m to 6m	Atlas Copco	Compressed air
2	Compressor	2	-	400 psi	Atlas Capco	Diesel Drive

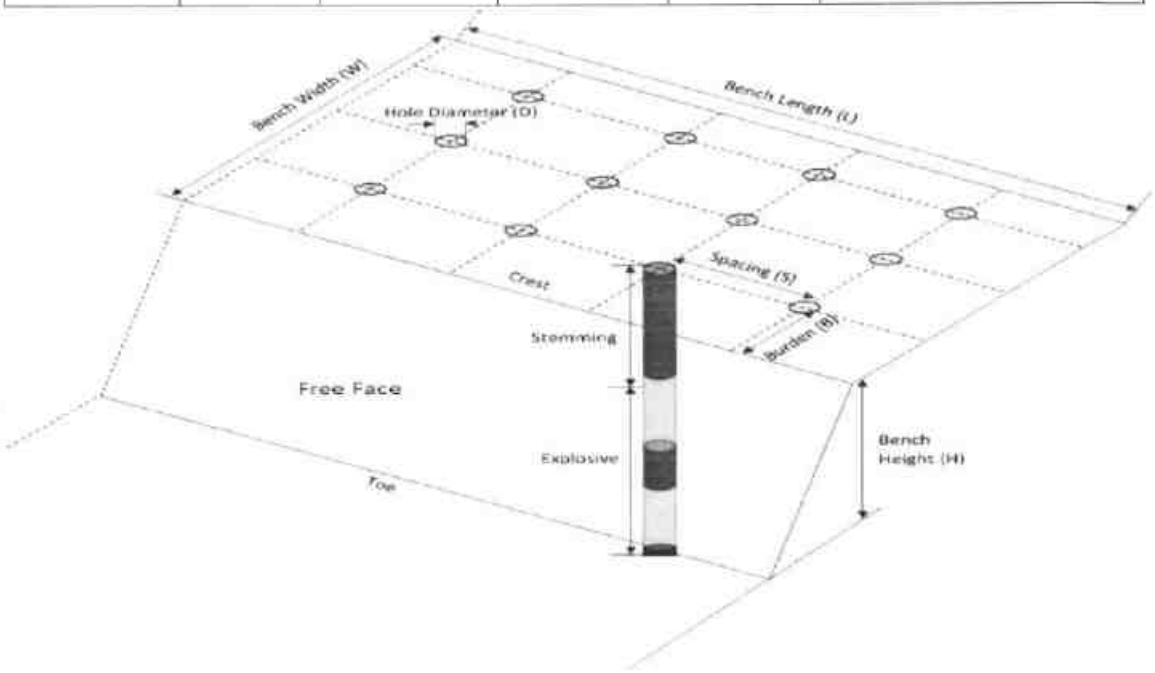
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<table>
<tr><td></td><td>b.</td><td>Loading</td><td>:</td><td>Excavator of 0.90m³ bucket capacity (with Rock breaker attachment) (1No).</td></tr>
<tr><td></td><td>c.</td><td>Transportation</td><td>:</td><td>Tipper 3Nos (5/10Ts) capacity.</td></tr>
<tr><td>5.6</td><td></td><td>Disposal of Overburden</td><td>:</td><td>The overburden in the form of Gravel, after the excavation gravel will be directly loaded into tipper to the needy buyers for road project and construction works for filling and leveling of low lying areas.</td></tr>
<tr><td>5.7</td><td></td><td>Brief Note on Conceptual Mining Plan for the entire lease period</td><td>:</td><td>Conceptual Mining Plan is prepared with an object of ten years of systematic development of bench lay outs, selection of ultimate pit limit, depth of quarrying, ultimate pit slope, selection of sites for construction of infrastructures etc.
Ultimate pit size is designed based on certain practical factors such as the economical depth of mining, safety zones, permissible areas etc.
Ultimate Pit dimension is given as under,
<table><tr><td colspan="4">Ultimate Pit dimension (M)</td></tr><tr><td>Pit No</td><td>Length (max) in (m)</td><td>Width (Avg) in (m)</td><td>Depth(max) in(m)</td></tr><tr><td>I</td><td>195</td><td>77</td><td>32m (17m above ground level and 15m Below ground level)</td></tr></table>Afforestation has been proposed on all along the boundary barrier by planting trees.
All the baseline information studies like Air Quality monitoring, Noise and Vibration monitoring, Water Analysis studies will be carried out every year as per the MOEF norms.</td></tr>
</table>

6.0 Blasting:

6.1	Blasting Pattern	:	The massive formation shall be broken into pieces of portable size by drilling and blasting using jack hammers and shot hole blasting. Powder factor of explosives for breaking such hard rock shall be in the order of 6 to 7 Tonnes per K.g of explosives. Blasting parameters are as follows.

Diameter of the hole	Spacing	Depth	Burden for hole	Pattern of hole	Inclination of hole
32-36mm	0.6m	1 to 1.5m	0.6m	Zig Zag	70^0 from the horizontal



6.2	Types of Explosives	:	Small dia, 25mm slurry explosive are proposed to be used for shattering and heaving effect for removal and winning of Rough stone. No deep hole drilling or primary blasting is proposed.

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<table>
<tr><td>6.3</td><td>Measures proposed to minimize ground vibration due to blasting</td><td>:</td><td>➢ Controlled blasting measures will be adopted for minimizing ground vibration and fly rock.
➢ Shallow depths jackhammer drilling and blasting is proposed to be carried out with minimum use of explosive mainly to give shattering effect in rough stone for easy excavation and to control fly rock.
<table>
<tr><td>Number of holes</td><td>:</td><td>120</td></tr>
<tr><td>Powder factor</td><td>:</td><td>6Ts/Kg of explosives</td></tr>
<tr><td>Total explosive required</td><td>:</td><td>60Kg slurry explosives</td></tr>
<tr><td>Charge / hole</td><td>:</td><td>0.5Kg</td></tr>
<tr><td>Blasting time</td><td>:</td><td>12-2 Pm</td></tr>
</table></td></tr>
<tr><td>6.4</td><td>Storage of Explosives and safety measures to be taken while blasting.</td><td>:</td><td>➢ The applicant will engage an authorized explosive agency to carry out the small amount of blasting and it will be supervised by competent and statutory foreman/ mines manager.
➢ The applicant ensure that will appoint the Mate (Should have Valid Blaster Certificate) during Blasting Operation.</td></tr>
<tr><td colspan="4">7.0 Mine Drainage:</td></tr>
<tr><td>7.1</td><td>Depth of Water table</td><td>:</td><td>The ground water table is reported as 50m below ground level. In the proposed mining plan only 32m(17m above ground level and 15m Below ground level) depth has been envisaged as workable depth for safe & economic quarrying for the entire lease period. Hence the quarrying operation may not affect the ground water.</td></tr>
<tr><td>7.2</td><td>Arrangement and Places where the mine water is finally proposed to be discharged</td><td>:</td><td>The ground water may not rise immediately in this type of mining. However, the rain water percolation and collection of water from the seepage shall be less than 300lpm and it shall be pumped about periodically by a stand by diesel powered Centrifugal pump motivated with 7.5H.P.Motor. The quality of water is potable and it is not contaminated with any hazardous things. Hence, water stored in the quarry pit will be pumped into the adjacent agricultural fields. Further the water stored in the old pit will also be used for plantation purposes</td></tr>
</table>

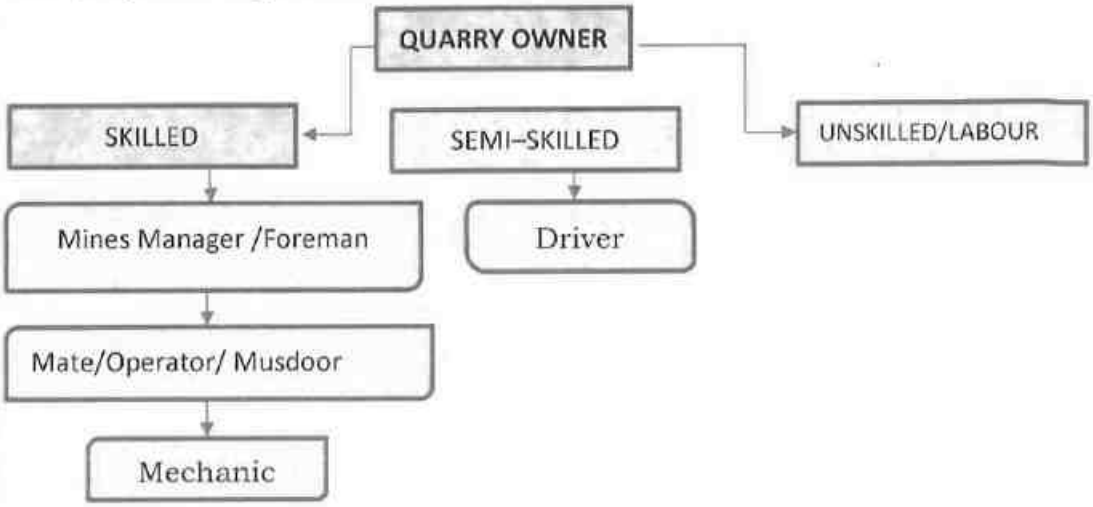
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8.0	**Other Permanent Structures:**		
8.1	Habitations / Village	:	There are no habitations within a radius of 300m.
8.2	Power lines (HT/LT)	:	There is no Power line (HT/LT) passing within a radius of 50m.
8.3	Water bodies (River, Pond, Lake, Odai, Channel etc)	:	There is a seasonal odai passing on northern side of the area and is 50m safety distance maintained from the odai. There is a Periya River passing on Southwestern side and is 470m away from the area.
8.4	Archeological / Historical Monuments	:	There are no Archeological / Historical Monuments within a radius of 500m.
8.5	Road (NH, SH, Village Road etc)	:	The National Highway (NH-48) Chennai – Krishnagiri is about 5.8Km on Northwestern side of the area. The State Highway (SH-122) Vellore – Tirupathur is about 0.35km on Northwestern side of the area.
8.6	Places of Worship	:	There are no Places of Worship within a radius of 500m.
8.7	Reserved Forest / Forest / Social Forest / Wild Life Sanctuary etc.,	:	There is Pallikonda Reserved Forest situated on eastern side and is 811m away from the area. There is no Wild Life Sanctuary etc within a radius of 1Km.
8.8	Any Interstate Border, Protected areas under the Wild Life (Protection) Act, 1972, Critically Polluted Areas as Identified by Central Pollution Control Board and Notified Eco sensitive areas	:	There are No inter State border within a radius of 10Kms.
8.9	Any Other Structures	:	Nil

9.0 Employment Potential & Welfare Measures:

9.1 Employment Potential (Management & Supervisory personal)

The proposed organization chart



1.	Skilled	Mines manager	1 No.
		Foreman / Mate	1 No.
		Operator	8 No.
		Mechanic	1 No.
2.	Semi-skilled	Driver	3 No.
3.	Unskilled	Labours	10Nos
		Total =	24Nos

Allowing 10% absentee, the no. of men of roll will be around 22.

The above man power is adequate to meet out the production schedule and the machinery strength envisaged in the mining plan and to comply the statutory provisions of Mines Safety Regulations.

- **It is been ensured that, child labours under 18 years of age will not be engaged for quarrying operation.**
- **Necessary life insurance policies will be taken by the applicant to all the employees up to the end of the lease period.**

9.2		Welfare Measures		
	a.	Drinking Water	:	Packaged drinking water is available from the nearby approved water vendors in Thangal village which is about 560m on Northeastern side of the area.

	b.	Sanitary facilities	:	Semi-permanent latrines & urinals shall be maintained at convenient places for use of labours as per the provisions of Rule (33) of the Mines Rules, 1960 separately for males and females. Washing facilities shall also be arranged as per rule (36) of the Mines Rules, 1960.
	c.	First Aid Facility	:	First aid kits are kept in Mines office room, in case of such eventualities the victim will be given first aid immediately at the site and injured person will be taken to the hospital. Hospital is available at distance of 21.0Km (NE) in Vellore the competent and Statutory foreman/ permit manager will be in charge of first aid.
	d.	Labour Health	:	As per Mines Rule, Periodic medical examination related to occupational health safety will be conducted to all the workers in applicant's own cost.
	e.	Precautionary safety measures to the Labourers:		
		Safety provisions like helmet, goggles, safety shoes, Dust mask, Ear muffs etc., have to be provided as per the circulars and amendments made for Mine labours under the guidance of DGMS being a mechanized operation. Necessary training will be conducted once in a year to all the employees with the help of qualified and experienced officers to train about the safe and systematic quarrying operation.  		

PART – B

10.0 Environmental Management Plan:

<table>
<tr><td>10.1</td><td>Existing Land Use Pattern</td><td>:</td><td>1. The area is exhibits hilly terrain covered by Gravel formation.
2. Quarrying operation is proposed up to a depth of 32m (17m above ground level and 15m Below ground level) for the proposed mining plan period.
3. Fluctuation of Water table in this area is in between 50m and 47m during a year.
4. This region receives the average annual rainfall of 800mm to 900mm. The surrounding area is practiced by the seasonal cultivation.
The existing land use pattern is given as under.
Table No-4
<table>
<tr><th>Sl. No.</th><th>Land Use</th><th>Present Area (Hect)</th><th>Area in use during the quarrying period (Hect)</th></tr>
<tr><td>1.</td><td>Quarrying Pit</td><td>Nil</td><td>1.50.20</td></tr>
<tr><td>2.</td><td>Infrastructure</td><td>Nil</td><td>0.01.00</td></tr>
<tr><td>3.</td><td>Roads</td><td>Nil</td><td>0.01.00</td></tr>
<tr><td>4.</td><td>Green Belt</td><td>Nil</td><td>0.20.00</td></tr>
<tr><td>5.</td><td>Unutilized</td><td>2.31.50</td><td>0.59.30</td></tr>
<tr><td></td><td>Total =</td><td>2.31.50</td><td>2.31.50</td></tr>
</table></td></tr>
<tr><td>10.2</td><td>Water Regime</td><td>:</td><td>Water table in this area is noticed at a depth of 50m and presently, in the proposed mining plan only 32m(17m above ground level and 15m Below ground level) depth has been envisaged as workable depth for safe & economic quarrying for the entire lease period. hence, it will not affect the ground water depletion of this area.</td></tr>
<tr><td>10.3</td><td>Flora and Fauna</td><td>:</td><td>Except acacia bushes, no other valuable trees are noticed in the applied area. Further, neither flora of botanical interest nor fauna of zoological interest is noticed in this area.</td></tr>
<tr><td>10.4</td><td>Climatic conditions</td><td>:</td><td>Generally subtropical climatic condition prevails throughout the year and there is no sharp variation in climate.
This District receives rain both in south west and north east monsoon.
The average rainfall is about 800mm to 900mm and the temperature ranges from 18°C during winter and to a maximum of 42°C during the summer.</td></tr>
</table>

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<table>
<tr><td>10.5</td><td>Human Settlement</td><td>:</td><td>The nearest habitations with the population is given as under.
Table No-5<table><tr><th>S. No</th><th>Name of the Village</th><th>Approximate distance & Direction from lease applied area</th><th>Approximate population</th></tr><tr><td>1.</td><td>Thangal</td><td>560m - NE</td><td>300</td></tr><tr><td>2.</td><td>Andikottai</td><td>1.0km - NW</td><td>200</td></tr><tr><td>3.</td><td>Pichanatham</td><td>1.6km - SE</td><td>400</td></tr><tr><td>4.</td><td>Karadikudi</td><td>1.5km - SW</td><td>300</td></tr></table></td></tr>
<tr><td>10.6</td><td>Plan for Air, Dust Suppression</td><td>:</td><td>Air or dust expected to be generated from drilling process, hauling roads, places of excavation etc., will be suppressed by periodical wetting of land by water spraying. Wet drilling and dust extractor arrangements will be provided to drilling units so as to control raise of dust from the site of drilling. Operators, those exposed directly to such conditions will be provide such protective equipment like mask, ear plug, helmet, gloze etc., as per the Mines Act.</td></tr>
<tr><td>10.7</td><td>Plan for Noise Control</td><td>:</td><td>Quarrying of Rough Stone will be carried out by drilling and blasting by using low power explosives, and hence, noise will be very minimum. However, periodical noise level monitoring will be carried out to check the noise level in and around the quarry site. Nowhere the noise level should exceed the permissible limit of 80db during the quarry working hours.</td></tr>
<tr><td>10.8</td><td>Environmental Impact Assessment Statement Describing Impact on mining on the next Five years</td><td>:</td><td>The mining plan proposed is for a small production of Rough stone without involving deep hole drilling and heavy blasting. Such limited mining activity is not likely to cause any impact adversely on environment as far as pollution of air, water and noise is concerned, anyhow environmental impact studies will be conducted as per EIA notification issued by MOEF. It is B2 Category mine.</td></tr>
</table>

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10.9	Proposal for Waste Management	:	There is no waste anticipated in this rough stone quarry operation.
10.10	Proposal of Reclamation of Land affected during mining activities and at the end of mining.	:	In the proposed mining plan 32m (17m above ground level and 15m Below ground level) depth has been envisaged as workable depth for safe & economic mining during the lease period. Hence, after quarry reaches ultimate pit limit (for this lease period) of 32m depth, fencing will be constructed around the quarried pits to prevent inherent entry of the public and cattle.
10.11	Program for Afforestation	:	The 7.5m safety distance along the lease boundary has been identified to be utilized for afforestation Appropriate native species of Neem/Pungan trees will be planted in a phased manner as described below.

Table No-6

Year	No. of tress proposed to be planted	Survival %	Area to be covered Sq.m	Name of the species	No of trees expected to be grown
I	30	80%	400	Neem/Pungan	24
II	30	80%	400	Neem/Pungan	24
III	30	80%	400	Neem/Pungan	24
IV	30	80%	400	Neem/Pungan	24
V	30	80%	400	Neem/Pungan	24

Nearly 2000Sqm area is proposed to use under afforestation by planting 30nos. of Neem/Pungan trees during every year with an anticipated survival rate of 80%. The Quarry landuse, layout and afforestation plan is shown in Plate No.III.

10.12	Proposed Financial Estimate / Budget for (EMP) Environment Management		
	A.Fixed Asset Cost:		
	1. Land Cost (600000/1Ha)=	:	Rs. 13,89,000
	2. First aid room and accessories	:	Rs.1,00,000
	3. Labour Shed		Rs.1,00,000
	4. Sanitary Facility		Rs.1,00,000
	Total=		**Rs. 16,89,000/-**

	B.Operational Cost: 1. Machineries 2. Fencing cost **Total**	: : : :	 Rs.50,00,000- Rs. 1,50,000 **Rs.51,50,000/-**
	C.EMP Cost: **Expenditure** 1. Drinking water facility 2. Sanitary Arrangments 3. Safety kids 4. Water sprinkling 5. Afforestation **Total=**	: : : : : : : : : :	Budget Provision for the entire quarrying period. Air Quality Sampling = Rs. 40,000/- Water Quality Sampling = Rs. 40,000/- Noise Monitoring = Rs. 20,000/- Ground vibration test = Rs. 20,000/- Rs.1,00,000/- Rs. 50,000/- Rs. 50,000/- Rs. 1,00,000/- Rs. 50,000/- **Rs. 4,70,000/-**
	Total Project Cost (A+B+C)	:	**Rs. 73,09,000/-**
	CSR Cost(2% of Total Project Cost)	:	**Rs. 1,46,180/-**

11.0 Mine Closure Plan:

11.1	Steps proposed for phased restoration, reclamation of already mined out area.	:	There is no proposal for back filling, reclamation and rehabilitation. The quarried pits after the end of the life of lease will be fenced to prevent inherent entry of public and cattles.
11.2	Measures to be under taken on mine closure as per Act & Rules	:	Measures will be taken as per the Acts and Rules. The quarried pit will be fenced by using Barbed wire fencing to prevent inherent entry of public and cattle.
11.3	Mitigation measures to be undertaken for safety and restoration/ reclamation of the already mined out area	:	Mitigation measures: Drilling will be carried out by wet drilling mode to control the dust propagation into the air. Blasting will be carried out on limited scale. Mist Water spraying on haul road is proposed to prevent the dust propagation into the air.

12.0 Any Other Details Intend to Furnish by the Applicant:

(i) Permission will be obtained from the District Mines Office to extract the Rough Stone from the Boundary barriers and for slopes.

(ii) Care and precautionary measures will be taken for the safety of workers as per Rules and Acts.

(iii) The applicant will endeavor every attempt to quarry the Rough Stone economically without any wastage and to improve the environment and ecology.

(iv) The Mining Plan is prepared by incorporating the conditions stipulated in the precise area communication issued and relevant mining laws in force.

(v) Any violation pointed out by the inspecting authorities shall be rectified as per the guidelines of the Department.

Prepared by

C.Natarajan, M.Sc.,M.Phil.,
Qualified Person
C.NATARAJAN M.Sc.,M.Phil.,
Qualified Person

Place : Salem
Date : 30.12.2022

This Mining Plan is approved subject to the conditions stipulated in the Mining Plan approval Letter No.
Dated.

This Mining Plan is approved as per the powers conferred under Rule 41 (2) of Tamil Nadu Minor Mineral Concession Rules 1959

12/01/23

ASSISTANT DIRECTOR,
Dept. of Geology & Mining,
Vellore.

13/1/23

Rc.No.71/2022(Mines) Date : 28.12.2022

O/o. The Assistant Director
Department of Geology and Mining
Collectorate,
Vellore District.

PRECISE AREA COMMUNICATION LETTER

Sub: Mines and Minerals – Minor Mineral – Vellore District – Anaicut Taluk – Karadikudi Village – SF.Nos.253/7, 259/5, 259/2 & 259/4 – Extent of 2.31.50 of patta lands – Quarry lease application preferred by Thiru.R.Natarajan for Quarrying Roughstone and Gravel - Recommendations received – Precise Area Communicated – Reg.

Ref: 1) Quarry lease application preferred by Thiru.R.Natarajan, dated: 13.05.2022.

2) The Revenue Divisional Officer, Vellore report Rc.No.A4/2576/2022 dated: 16.07.2022.

3) Inspection report of the Assistant Director of Geology and Mining, Vellore dated: 16.11.2022.

4) G.O.(MS)No.169 Industries(MMC.1) Department, dated 04.08.2020.

****

One Thiru.R.Natarajan S/o.Rangasamy, No.147, Ayyagoundarpatti, Kollamangalam Village, Gudiyatham Taluk, Vellore District applied for grant of lease for quarrying Roughstone and Gravel over an extent of 2.31.50 hectares of patta lands in SF.Nos.253/7, 259/5, 259/2 & 259/4 of Karadikudi Village, Anaicut Taluk, Vellore District for a period of 5 years under Rule 19 & 20 of Tamil Nadu Minor Mineral Concession Rules, 1959.

2) The Revenue Divisional Officer, Vellore has recommended for grant of quarry lease in the subject area and the Assistant Director, Geology and Mining, Vellore has also recommended for grant of quarry lease for quarrying rough stone and gravel over an extent of 2.31.50 hectares of patta lands in SF.Nos.253/7, 259/5, 259/2 & 259/4 of Karadikudi Village, Anaicut Taluk, Vellore District subject to certain conditions.

O/o. ASSISTANT DIRECTOR GEOLOGY & MINING VELLORE

In view of the above, based on the recommendations of the Revenue Divisional Officer, Vellore and Geological field observations of the Assistant Director of Geology and Mining, an extent of 2.31.50 hectars of patta land in SF.Nos.253/7, 259/5, 259/2 & 259/4 of Karadikudi Village, Anaicut Taluk, Vellore District is hereby fixed as precise area and communicated to the applicant as per the powers conferred under Rule 41(4) of Tamil Nadu Minor Mineral Concession Rule as amended vide G.O.169 Industries (MS) Department, dated 04.08.2020 for grant of lease for quarrying Roughstone & Gravel in favour of Thiru.R.Natarajan for a period of 5 years under Rule 19 & 20 of Tamil Nadu Minor Mineral Concession Rules, 1959 subject to the following conditions.

Conditions

1. 7.5 meters safety distance should be left out for the adjacent patta lands.
2. 10 meters safety distance should be left out for the adjacent Government Poramboke lands.
3. The applicant shall not make any hindrance to the adjacent lands and public.
4. Quarrying should be restricted in the lease granted area only and barbed wire fencing should be erected all along the boundary of the lease granted area before commencement of quarrying operation.
5. Blasting of rock should be done by the short fire method with less explosives in between 12.00 Noon to 2.00 P.M., after giving Proper signal by siren as per the provisions of Indian Explosives Act, 1884.
6. Quarrying should be carried out in scientific and systematic manner.

The applicant Thiru.R.Natarajan is directed to submit the Mining plan within 90 days to the Assistant Director of Geology and Mining, Vellore for approval and also to submit Environmental Clearance issued by State Environmental Impact Assessment Authority (SEIAA) as required under Rule 41 & 42 of Tamil Nadu Minor Mineral Concession Rules, 1959 for the above area for further process.

Assistant Director,
Geology and mining,
Vellore.

To:

Thiru.R.Natarajan,
S/o.Rangasamy,
No.147, Ayyagoundarpatti,
Kollamangalam Village,
Gudiyatham Taluk,
Vellore District.

Copy to

1.The Chairman,
SEIAA,3rd Floor, Panagal Maaligai,
No.1, Jeenis Road, Saidapet,
Chennai-15.

2.The Commissioner of
Geology and Mining,
Guindy, Chennai-32.

ANNEXURE II

Dist: Vellore

Taluk: Arcot

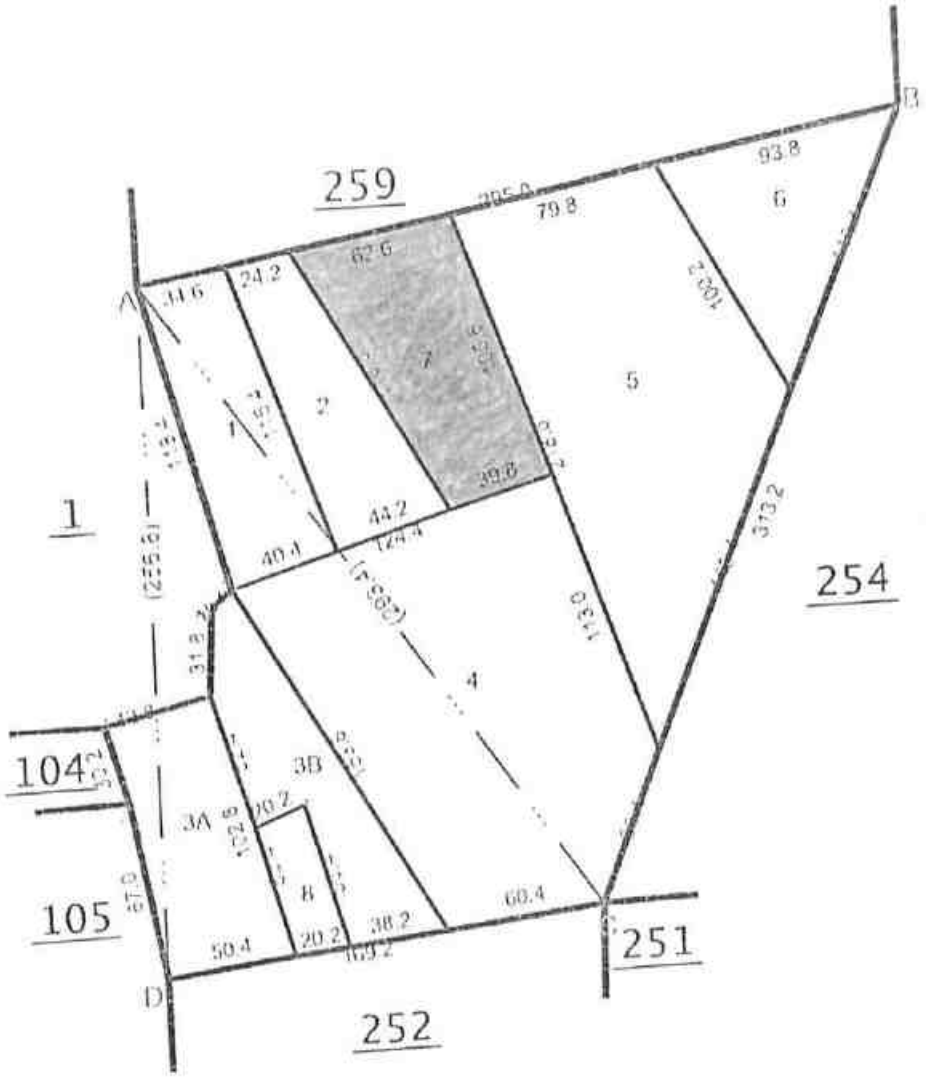
Village: Kavanthandal [B]

Survey No: 253

Area: Hect 05 Ares 91.00

Scale: 1: 2548

D.D. ASSISTANT DIRECTOR MINING VELLORE



LEASE APPLIED AREA

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District : Vellore

Taluk : Anaicut

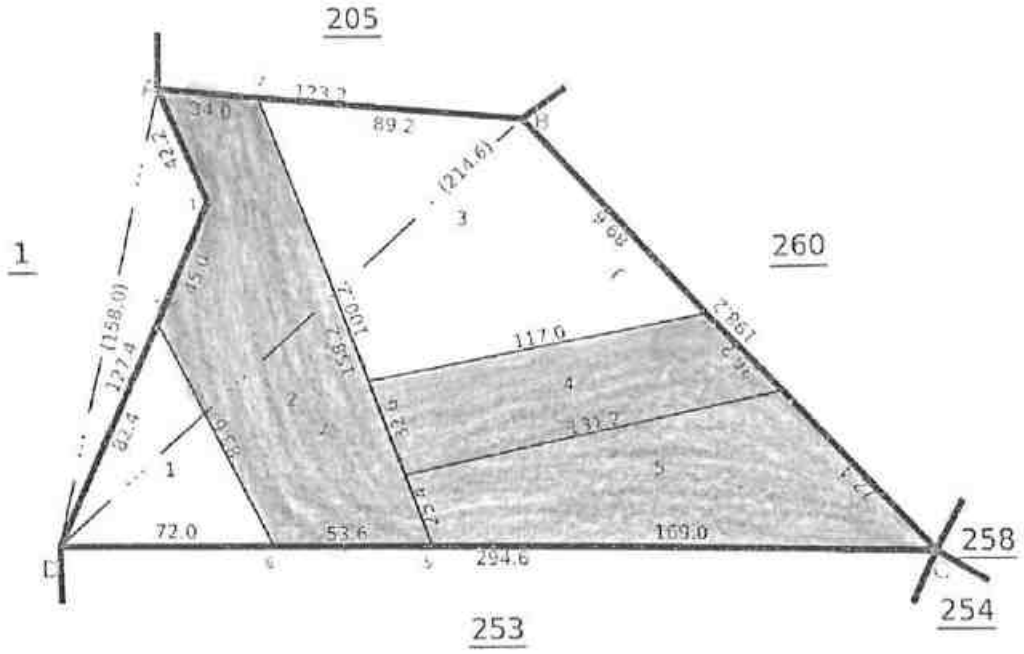
Village : Karadikudi [8]

Survey No : 259

Area : Hect 02 Ares 87.50

Scale : 1 : 2255

ASSISTANT DIRECTOR • DWMA • VELLORE



LEASE APPLIED AREA

Date of Issue: 28-07-2021 15:33:16

mv.240

Survey and Settlement Department, Government of TamilNadu

Scanned with CamScanner


RESERVE
LEASE APPLIED AREA
ANNEXURE
Parasheri
KARAIKUDI
Burgandhiru Tippal 50 Feet high Visible 2 Miles round
Parasheri

ANNEXURE IV

ASSISTANT DIRECTOR VELLORE

தமிழக அரசு

வருவாய்த் துறை

நில உரிமை விபரங்கள் : இ. எண் 10(1) பிரிவு

மாவட்டம் : வேலூர் வட்டம் : அணைக்கட்டு

வருவாய் கிராமம் : கரடிகுடி பட்டா எண் : 757

உரிமையாளர்கள் பெயர்

1. ரங்கசாமி மகன் நடராசன்

புல எண்	உட்பிரிவு	புன்செய்		நன்செய்		மற்றவை		குறிப்புரைகள்
		பரப்பு	நீர்வை	பரப்பு	நீர்வை	பரப்பு	நீர்வை	
		ஹெக் - ஏர்	ரூ - பை	ஹெக் - ஏர்	ரூ - பை	ஹெக் - ஏர்	ரூ - பை	
104	3	0 - 37.50	0.99	--	--	--	--	---- -- 31-07-2015
252	3	0 - 34.50	0.90	--	--	--	--	---- -- 05-10-2005
252	4	0 - 44.50	1.17	--	--	--	--	---- -- 13-01-2005
252	6	0 - 19.50	0.51	--	--	--	--	---- -- 05-10-2005
252	7	0 - 20.00	0.52	--	--	--	--	---- -- 05-10-2005
252	8	0 - 12.00	0.32	--	--	--	--	---- -- 05-10-2005
253	7	0 - 53.50	1.40	--	--	--	--	---- -- 05-10-2005
254	1	0 - 25.00	0.66	--	--	--	--	2019/0103/04/152111- -- -- 19-10-2019
254	10	0 - 33.00	0.86	--	--	--	--	---- -- 05-10-2005
254	8	0 - 18.00	0.48	--	--	--	--	---- -- 13-01-2005
254	9	0 - 15.50	0.40	--	--	--	--	---- -- 05-10-2005
259	5	0 - 62.50	1.63	--	--	--	--	---- -- 05-10-2005
		3 - 75.50	9.84					

குறிப்பு2 :

1. மேற்கண்ட தகவல் / சான்றிதழ் நகல் விவரங்கள் மின் பதிவேட்டிலிருந்து பெறப்பட்டவை. இவற்றை தாங்கள் **https://eservices.tn.gov.in** என்ற இணைய தளத்தில் **04/10/008/00757/110879** என்ற குறிப்பு எண்ணை உள்ளீடு செய்து உறுதி செய்துகொள்ளவும்.
2. இத் தகவல்கள் 21-03-2022 அன்று 02:21:32 PM நேரத்தில் அச்சடிக்கப்பட்டது.
3. கைப்பேசி கேமராவின்2D barcode படிப்பான் மூலம் படித்து 3G/GPRS வழி இணையதளத்தில் சரிபார்க்கவும்

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தமிழக அரசு

வருவாய்த் துறை

நில உரிமை விபரங்கள் : இ. எண் 10(1) பிரிவு

மாவட்டம் : வேலூர் வட்டம் : அணைக்கட்டு

வருவாய் கிராமம் : கரடிகுடி பட்டா எண் : 943

உரிமையாளர்கள் பெயர்

1. ரங்கசாமி கவுண்டர் மகன் நடராஜன்

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	
259	2	0 - 77.50	2.04	--	--	--	--	2019/0103/04/152111- -- -- 19-10-2019
259	4	0 - 38.00	1.00	--	--	--	--	2016/0103/04/010292- -- -- 27-09-2016
		1 - 15.50	3.04					

குறிப்பு2 :

1. மேற்கண்ட தகவல் / சான்றிதழ் நகல் விவரங்கள் மின் பதிவேட்டிலிருந்து பெறப்பட்டவை. இவற்றை தாங்கள் **https://eservices.tn.gov.in** என்ற இணைய தளத்தில் **04/10/008/00943/130836** என்ற குறிப்பு எண்ணை உள்ளீடு செய்து உறுதி செய்துகொள்ளவும்.
2. இத் தகவல்கள் 21-03-2022 அன்று 03:09:43 PM நேரத்தில் அச்சடிக்கப்பட்டது.
3. கைப்பேசி கேமராவின்2D barcode படிப்பான் மூலம் படித்து 3G/GPRS வழி இணையதளத்தில் சரிபார்க்கவும்

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ANNEXURE V

432 – ஆம் பசலியில் வேலூர் மாவட்டம் அணைக்கட்டுவட்டம் கிராமத்திற்காக

ASSISTANT DIRECTOR GEOLOGY & MINING

நில வரித் திட்டத்தின்படி புலன்களின் விபரம்.					கைப்பற்று தாரருடைய பெயரும் எண்ணும் அல்லது அனுபோக தாரருடைய பெயர்.	சாகுபடியாளியின் பெயர்.	முதல் போகம்.				
நில அளவை எண்.	உட்பிரிவு எண்.	பரப்பு.	தீர்வை.	ஒரு போகம் அல்லது இரு போகம்.		நிலத்தின் எந்த பகுதி யாவது சாகுபடியாளரால் பயிரிடப்பட்டுள்ளதா.	எந்த மாதத்தில் பயிர் செய்யப்பட்டது எந்த மாதத்தில் அறுவடை செய்யப்பட்டது.	பயிரின் பெயர்.	பயிராக / அறுவடை யான பரப்பு.	உண்மையான பாய்ச்சல் ஆதாரம்.	விளைச்சல் அளவு விபரம்.
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
253	7	0.53.5	1.40	757	நடராசன்	ஆம்					
									உண்மையானது		
									07.5		

Village Administrative Officer
11/Kaikal
12. Ongapadi
Anaicut Taluk, Vellore District

TAHSILDAR
ANAICUT.

8/7/22

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1132 – ஆம் பசலியில் வேலூர் மாவட்டம் அணைக்கட்டு வட்டம் 11. காட்பாடி

நில அளவை எண் (1)	உட்பிரிவு எண். (2)	மாப்பு (3)	ரிர்காலை. (4)	ஒரு போகம் அல்லது இரு போகம். (5)	கைம்பற்று தாருடைய பெயரும் எண்ணும் அல்லது அனுபோக தாருடைய பெயர். (6)	ஏரிகுளம் வாய்க்கால் போன்ற பொதுப் பயன்பாட்டில் உள்ள புறம்போக்கு நிலமாயின் அதன் பெயர். (7)	முதல் போகம். (8)	(9)	(10)	(11)	(12)
259	2	0.77.5	2.4	943	நடராஜன்	நிரை			உள்ளாமருதம்		

Village Administrative Officer
11. Kaladikudi
12. Ongapadi
Anaicut Taluk, Vellore District

8/7/22

380/26-R.F. III-A-10-50,00,000 Cps.-GBP.-Mdu-7-2018.

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ASSISTANT DIRECTOR
VELLORE
GEOLOGY & MINING

கிராமம் ... வட்டம் அணைக்கட்டு வட்டம் மாவட்டம் வேலூர்

32 - ஆம் பகுதியில்

நில வரித் திட்டத்திற்படி புலங்களின் விபரம்.					சர்வேயர் தரைப்படம் பெறும் வரையில் அதன் தற்போதைய நிலைமை பற்றி	காலப்பயிர் பார்வை	முதல் போகம்.				
நில அளவை எண்	உட்பிரிவு எண்	பரப்பு	தீர்வை	ஒரு போகம் அல்லது நிரை போகம்		நிலத்தில் எந்த வகையான பயிர் எவ்வளவு காலமாக பயிரிடப் பட்டுள்ளது.	எந்த வகையில் பயிர் செய்யப்பட்டுள்ளது. (மானாவாரி அல்லது நன்செய்)	பயிரின் பெயர்.	பயிரை அனுபவிப்பவர் பெயர் மற்றும் முகவரி	உரிமையாளர் அல்லாத பாத்தியம் உள்ளோர்.	விவசாயம் அல்லாத விபரம் (குறிப்பு)
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
259	4	038.0	1.0	943	சுடாரைஸ்	ஒன்று			உரிமையாளர்		

Village Administrative Officer
M. Kandigaikudi
12. Ongappadi
Anaicut Taluk, Vellore District

8/7/22

380/26-R.F. III-A-10-50,00,000 Cps.-GBP.-Mdu-7-2018.

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கிராமம் வட்டம் மாவட்டம்

நில வரிசை எண். (1)	உட்பிரிவு எண். (2)	பரப்பு. (3)	தீர்வை. (4)	ஒரு போகம் அல்லது இரு போகம் (5)	(6)	வைப்பு மானியம் கோரல் (7)	முதல் போகம்.				
							காஞ்சி மாவட்டத்தில் பின்னர் தெரியவரும் ஏதேனும் மறைந்துள்ள கனிமங்கள் தொடர்பான (8)	பயிரின் பெயர். (9)	பயிரை / அறுவடை யான பரப்பு. (10)	உள்ளபடியான பாய்ச்சல் ஆதாரம். (11)	விளைச்சல் ஏதேனும் விபரக்கூறு. (12)
259	5	0.62.5	1.63	757	நடராசன்	நிரு			1 மாமரங்கள்		

07.5

Village Administrative Officer
11. Kandikuppam
12. Ongapadi
Arcot Taluk, Vellore District

TAHSILDAR
ARCOT

ASSISTANT DIRECTOR
O/o GEOLOGY & MINING
VELLORE

Scanned with CamScanner

ANNEXURE
ASSISTANT DIRECTOR
GEOLOGY & MINING
VELLORE

கி. எண். 8. காஞ்சிபுரம்.

1	2	3	4	5	6	7	8	9	10	11	12			
							ஒ.பை	நிலஅ.ஏக்கர்	ஒ.பை					
6	253-6	அ	ப	...	7-4	5	2 62	0 44.5	1 17	.....	அரசாங்கம்	255	5	255
7	-7	ஓ	ப	...	7-4	5	2 62	0 53.5	1 40	287 ஓ.பாப்பம்மாள்			6	
8	-8	ஓ	ப	...	7-4	5	2 62	0 11.0	0 29	57 பெ.காதி ராஜன்.			7	
								5 91.0	15 48					
1	254-1	ஓ	ப	...	7-4	5	2 62	0 25.0	0 65	209 மொ.செல்லியம் மாள்.		256	(1)	256
2	-2	ஓ	ப	...	7-4	5	2 62	0 38.5	1 00	80 குப்பன்.			2	
3	-3	ஓ	ப	...	7-4	5	2 62	0 87.5	2 29	362 ப.முனியம் மாள்.			3	
4	-4	அ	ப	...	7-4	5	2 62	0 34.0	0 89	.....	அரசாங்கம்		(4)	
5	-5	ஓ	ப	...	7-4	6	2 62	0 57.5	1 50	224 தாசப்பதாயுடு.				
6	-6	ஓ	ப	...	7-4	5	2 62	0 18.0	0 47	12 பொ.அயிஷ மாள்.				
7	-7	அ	ப	...	7-4	5	2 62	0 72.5	1 90	.....	அரசாங்கம்		5A	-
8	-8	ஓ	ப	...	7-4	5	2 62	0 18.0	0 48	130 கோவிந்தன்			5B	-
9	-9	ஓ	ப	...	7-4	5	2 62	0 15.5	0 40	574 ப.சின்ன கண்ணு(1), ப.தடராஜன்(2)			5C	-
10	-10	ஓ	ப	...	7-4	5	2 62	0 33.0	0 86	574 ப.சின்ன கண்ணு(1). ப.தடராஜன்(2)			6	-
								3 99.0	10 45	0.005		257	1A	257
1	255-1	ஓ	ப	...	7-4	5	2 62	0 81.5	2 13	52 க.கன்னன்.			1B	-
2	-2	ஓ	ப	...	7-4	5	2 62	0 77.5	2 02	327 மாணிக்கம்.			1C	-
3	-3	ஓ	ப	...	7-4	5	2 62	0 72.0	1 89	574 ப.தடராஜன்(1) ப.சின்ன கண்ணு(2).			1D	-
4	-4	ஓ	ப	...	7-4	5	2 62	0 27.0	0 71	81 ல.குப்ப போயன்.			1E	-

12 கன்னிகாபுரம்

Village Administrative Officer
11. Kangundi
12. Ongapadi
Anaicut Taluk, Vellore District

Scanned with CamScanner

1	2	3	4	5	6	7	8	9	10	11
							ஏ. வா.	ஆகாரவரி	ஏ. வா.	
258	10	258-10	ஏ	மி	...	7-4	5	2 62	0 26·0	0 68	669 செ.நீரோ மற்றவர்களுக்கு சொந்தமானது.*
									2 75·0	7 21	
259	1	259-1	ஏ	மி	...	7-4	5	2 62	0 27·5	0 72	683 வா.மாடி மற்றவர்களுக்கு சொந்தமானது.*
	2	-2	ஏ	மி	...	7-4	5	2 62	0 77·5	2 04	642 மி.குப்பன் (1), ம.வெங்கட சேஷ (2), த.மல்லிகா (3).
	3	-3	ஏ	மி	...	7-4	5	2 62	0 82·5	2 14	643 ஏ.சென்னகேசவ ஆந்தி (1), செ.ர. வைபவா (2), ப.ஜெயந்தி (3).
	4	-4	ஏ	மி	...	7-4	5	2 62	0 38·0	1 00	211 ஏ.செங்கம் மாள்
	5	-5	ஏ	மி	...	7-4	5	2 62	0 62·5	1 63	582 செ.மாரிக்க பத்து (1), செ.வரதன் (2).
									2 87·5	7 53	
260	1	260-1	ஏ	மி	...	7-4	5	2 62	0 36·5	1 47	490 ப.ஜெயந்தி.
	2	-2	ஏ	மி	...	7-4	5	2 62	0 22·5	0 59	382 ஆ.சங்கயந்தி.
	3	-3	ஏ	மி	...	7-4	5	2 62	0 70·5	0 54	..... அனாதினம்.
	4	-4	ஏ	மி	...	7-4	5	2 62	0 16·0	0 41	646 செ.வரதன் (1), செ.ர.ரதி (2), செ.மாரிக்க பத்த (3).
	5	-5	ஏ	மி	...	7-4	5	2 62	0 38·5	1 01	460 ப.ஜெயந்தி.
	6	-6	ஏ	மி	...	7-4	5	2 62	0 41·5	1 09	69 ஜ.சிங்கம்.
	7	-7	ஏ	மி	...	7-4	5	2 62	0 29·5	0 79	..... அனாதினம்.
	8	-8	ஏ	மி	...	7-4	5	2 62	0 37·0	0 96	179 சின்னையன். சந்தர்.வ.
	9	-9	ஏ	மி	...	7-4	5	2 62	0 47·5	1 24	670 செ.ர.தயாளன் மற்றவர்களுக்கு சொந்தமானது.*
	10	-10	ஏ	மி	...	7-4	5	2 62	0 34·5	0 90	460 ப.ஜெயந்தி.

* Subject to encumbrances if any.

Village Administrative Officer
11. Kavadipet
12. Ongapur
Ambur Taluk, Vellore District

ASSISTANT DIRECTOR • SURVEY & LAND RECORDS • VELLORE

Scanned with CamScanner

ANNEXURE VII

O/o. ASSISTANT DIRECTOR VELLORE GEOLOGY & MINING


இந்திய அரசாங்கம்
Government of India
நடராஜன் ரங்கசாமி
NADARAJAN RANGASAMY
தந்தை : ரங்கசாமி
Father : RANGASAMY
பிறந்த நாள் / DOB : 19/08/1947
ஆண்பால் / Male
4779 2774 4339
ஆதார் - சாதாரண மனிதனின் அதிகாரம்


Unique Identification Authority of India
முகவரி:
S/O: ரங்கசாமி, 26, அய்யா கவுண்டர்பட்டி, கொல்லமங்கலம், கொல்லமங்கலம், வேலூர், கொல்லமங்கலம், தமிழ் நாடு, 635809
Address:
S/O: Ranagasamy, 26, AYYA GOUNDAR PATTI, GOLLAMANGALAM, Gollamangalam, Vellore, Gollamangalam, Tamil Nadu, 635809
4779 2774 4339
1947
1800 300 1947
help@uidai.gov.in
www.uidai.gov.in

ANNEXURE VIII

CHETTINAD CEMENT CORPORATION LTD.

(Regd. Office: RANI SEETHAI HALL BUILDING IV & V FLOORS, 603, ANNA SALAI, MADRAS-600 006.)
WORKS OFFICE: PULIYUR.

TELE: PHONE 21144 22744 21745 KARUR
GRAM "CEMENT" Puliyur C.F.
Telex: 0456-215.
STD Code: 04324

Kumararajah Muthaiah Nagar,
PULIYUR CEMENT (TT DIST) 639114.
Karur Taluk. (T.N.STATE.)

2nd September, 1987.

T.RAJU.,B.E.,
MINES MANAGER & DY.GENERAL MANAGER.

CERTIFICATE.

This is to certify that Mr.C.Natarajan has been working as a Geologist from 14-12-1979 to till date. He has been incharge of supervision of day to day functions in respect of Exploration, Preparation of Geological Plans & Sections, Preparation of Mines Plans, Quality control and other allied mining activities in the following Pits of our Seethainagar Limestone Mines in Anna District.

Name of the Pit.		Average Raising/day.
1. Alambadi Pit.	-	1,700 T.
2. Mallapuram Pit.	-	900 T.
3. Karikkali Pit.	-	150 T.
Total.	-	2,750 T.

He has got nearly Eight years of total experiance in our Mines in the above supervisory capacity.

for CHETTINAD CEMENT CORPORATION LTD.,

(T.RAJU).
Mines Manager & Dy. General Manager.

3249.

Annamalai University

Faculty of Science

The Senate of the Annamalai University hereby makes known that E. Saroja has been admitted to the Degree of Master of Science (By Examination) in Zoology, he having been certified by duly appointed Examiners at the examination held in April 1976, to be qualified to receive the same and that he was placed in the First Class.

Given under the seal of the University.

Annamalainagar,
8th December, 1976.

A. Chandrasekhar
Vice-Chancellor.

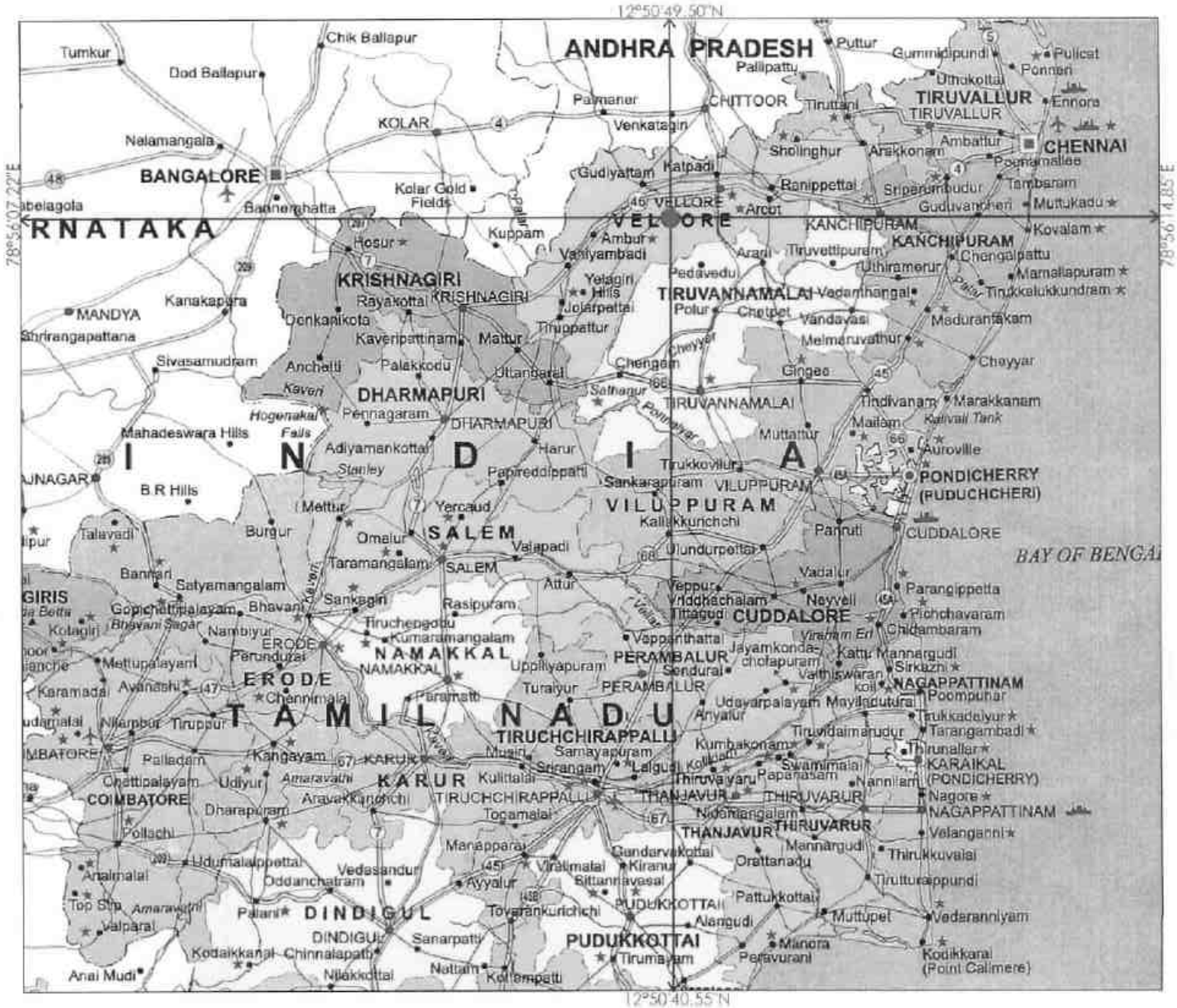


PLATE NO: I

DATE OF SURVEY : 29.12.2023

APPLICANT:

THIRU.R.NATARAJAN,
S/O.RANGASAMY,
NO.14, AYYAGOUNDARPATTI,
KOLLAMANGALAM VILLAGE,
GUDIYATHAM TALUK,
VELLORE DISTRICT.

QUARRY LEASE APPLIED AREA:

S.F.NO's : 253/7, 259/5, 259/2 & 259/4,
EXTENT : 2.31.50 Ha,
VILLAGE : KARADIKUDI,
TALUK : ANAICUT,
DISTRICT : VELLORE.

INDEX

Q. L. A. AREA :

TOPO SHEET NO : 57L/ 13

LATITUDE: 12°50'40.55"N to 12°50'49.50"N

LONGITUDE: 78°56'07.22"E to 78°56'14.85"E

LOCATION PLAN NOT TO SCALE

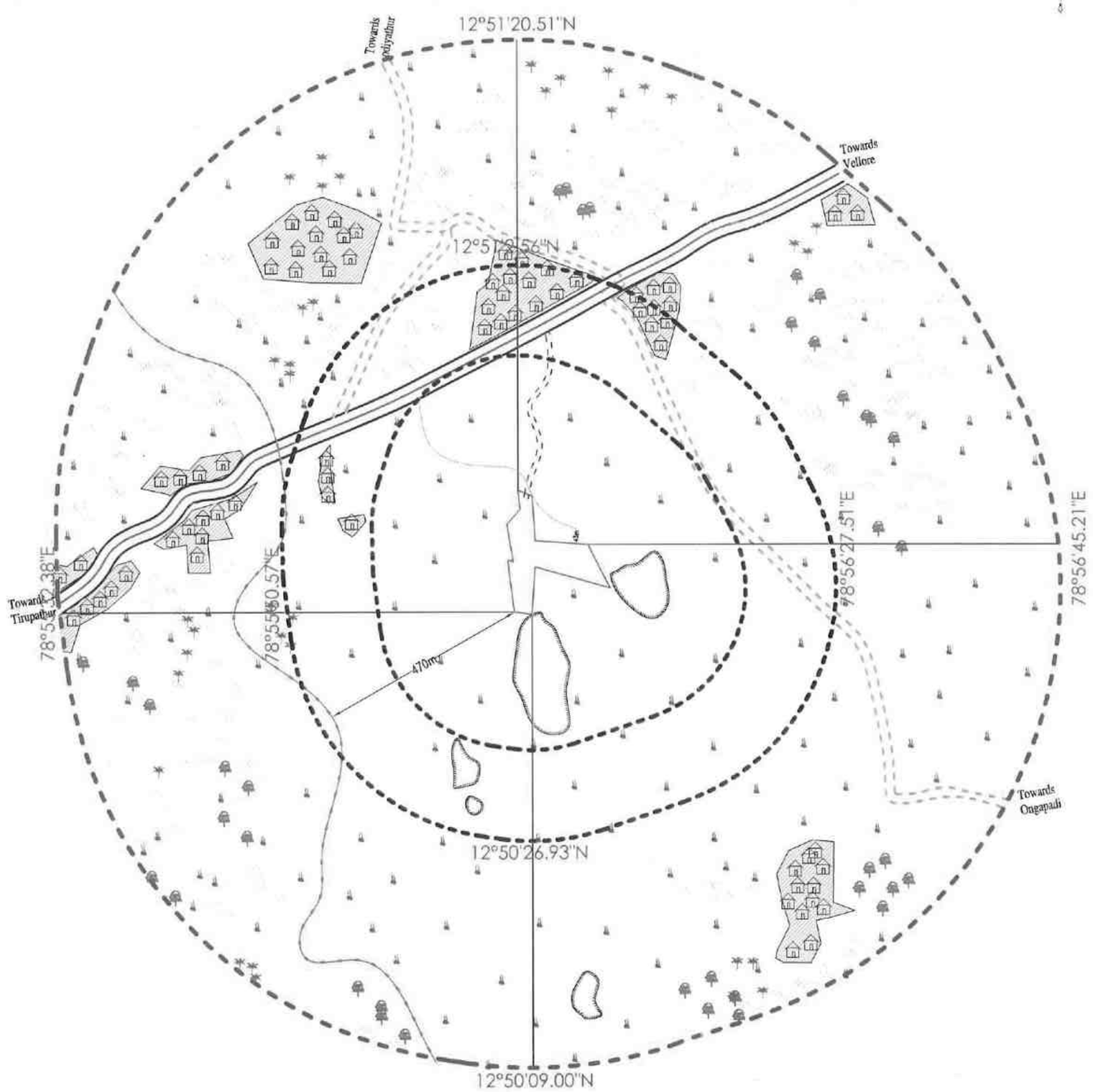
PREPARED BY

THIS IS TO CERTIFY THAT THE INFORMATION IN THIS PLATE IS TRUE & CORRECT TO THE BEST OF MY KNOWLEDGE BASED UPON THE LEASE DOCUMENTS AUTHENTICATED BY STATE GOVERNMENT.

C.NATARAJAN,M.Sc,M.Phil.
QUALIFIED PERSON

PLATE NO: 1A

DATE OF SURVEY : 29.12.2023



APPLICANT:

THIRU.R.NATARAJAN,
S/O.RANGASAMY,
NO.14, AYYAGOUNDARPATTI,
KOLLAMANGALAM VILLAGE,
GUDIYATHAM TALUK,
VELLORE DISTRICT.

ASSISTANT DIRECTOR • MINING & GEOLOGY • VELLORE • O/o

QUARRY LEASE APPLIED AREA:

S.F.NO's : 253/7, 259/5, 259/2 & 259/4,
EXTENT : 2.31.50 Ha,
VILLAGE : KARADIKUDI,
TALUK : ANAICUT,
DISTRICT : VELLORE.

INDEX

TOPO SHEET NO : 57L/ 13

LATITUDE:12°50'40.55"Nto12°50'49.50"N

LONGITUDE:78°56'07.22"Eto78°56'14.85"E

Q.L.APPLIED AREA	
300M RADIUS	
500M RADIUS	
1KM RADIUS	
APPROACH ROAD	
PANCHAYAT ROAD ROAD	
STATE HIGHWAY	
BARREN LAND	
TREES	
AGRICULTURAL LAND	
QUARRY PIT	
RIVER	
ODAI	
HABITATIONS	

ENVIRONMENTAL 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

C.NATARAJAN,M.Sc.,M.Phil.,
RECOGNIZED QUALIFIED



N

ASSISTANT DIRECTOR • MINES & GEOLOGY • VELLORE

PLATE NO: 1B

DATE OF SURVEY : 29.12.2023

APPLICANT:

THIRU.R.NATARAJAN,
S/O.RANGASAMY,
NO.14, AYYAGOUNDARPATTI,
KOLLAMANGALAM VILLAGE,
GUDIYATHAM TALUK,
VELLORE DISTRICT.

QUARRY LEASE APPLIED AREA:

S.F.NO's : 253/7, 259/5, 259/2 & 259/4,
EXTENT : 2.31.50 Ha.
VILLAGE : KARADIKUDI,
TALUK : ANAICUT,
DISTRICT : VELLORE.

INDEX

TOPO SHEET NO : 57L/ 13

LATITUDE:12°50'40.55"Nto12°50'49.50"N

LONGITUDE:78°56'07.22"Eto78°56'14.85"E

Q.L.APPLIED AREA	
300M RADIUS	
500M RADIUS	
1KM RADIUS	
APPROACH ROAD	
PANCHAYAT ROAD	
STATE HIGHWAY	

SATELLITE IMAGERY

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

C.NATARAJAN,M.Sc,M.Phil.
RECOGNIZED QUALIFIED

PLATE NO-I C

DATE OF SURVEY : 29.12.2023

APPLICANT:

THIRU.R.NATARAJAN,
S/O.RANGASAMY,
NO.14, AYYAGOUNDARPATTI,
KOLLAMANGALAM VILLAGE,
GUDIYATHAM TALUK,
VELLORE DISTRICT.

ASSISTANT DIRECTOR * MINES & GEOLOGY VELLORE

QUARRY LEASE APPLIED AREA:

S.F.NO's : 253/7, 259/5, 259/2 & 259/4,
EXTENT : 2.31.50 Ha,
VILLAGE : KARADIKUDI,
TALUK : ANAICUT,
DISTRICT : VELLORE.

INDEX

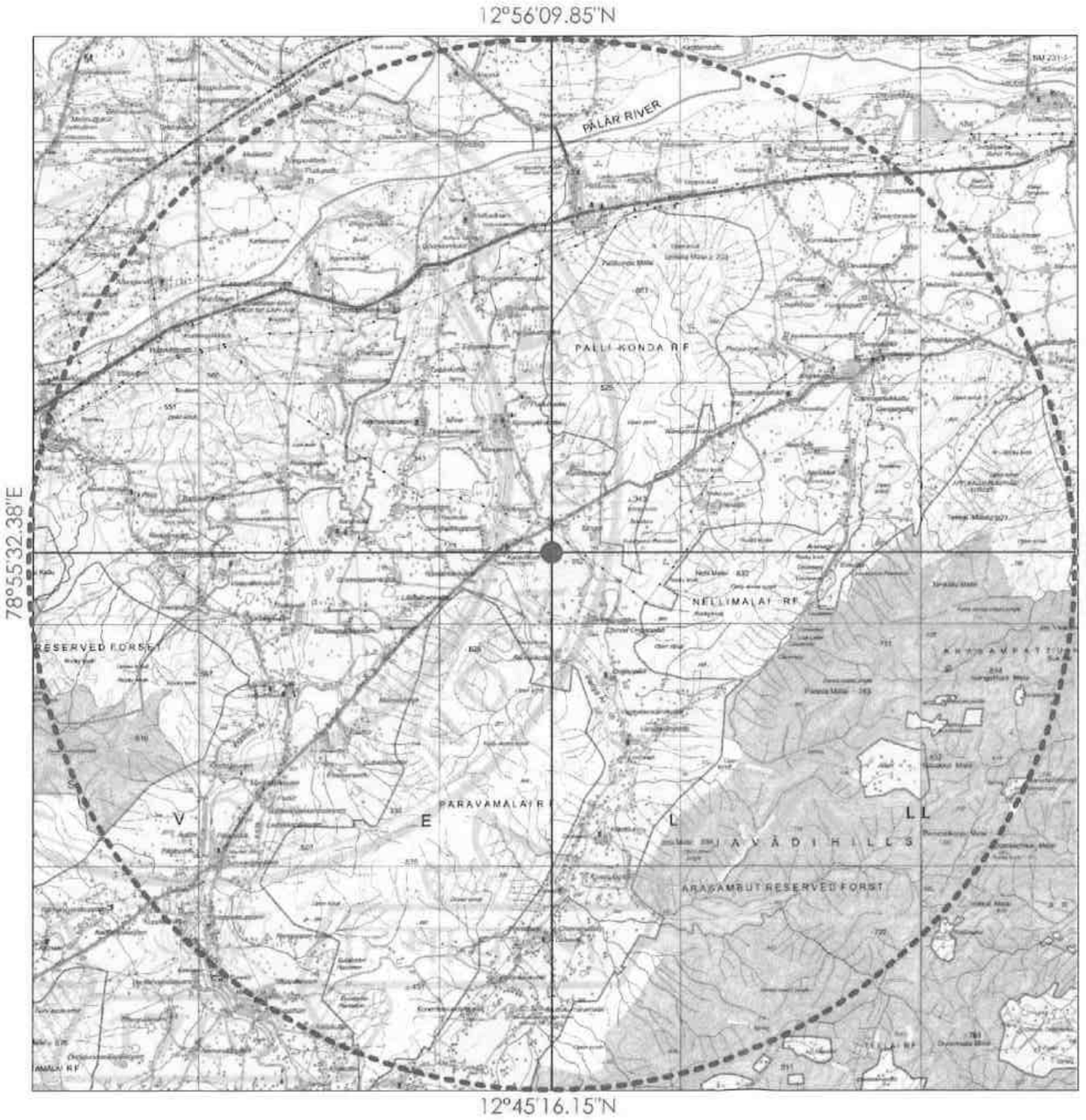
TOPO SHEET NO : 57L/ 13

LATITUDE:12°50'40.55"Nto12°50'49.50"N

LONGITUDE:78°56'07.22"Eto78°56'14.85"E

Q.L.APPLIED AREA

10KM RADIOUS



CONVENTIONAL SYMBOLS

TOPO SKETCH OF QUARRY LEASE APPLIED AREA FOR 10Km RADIUS

SCALE– 1:100000

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

C.NATARAJAN,M.Sc,M.Phil.
RECOGNIZED QUALIFIED

KEY PLAN

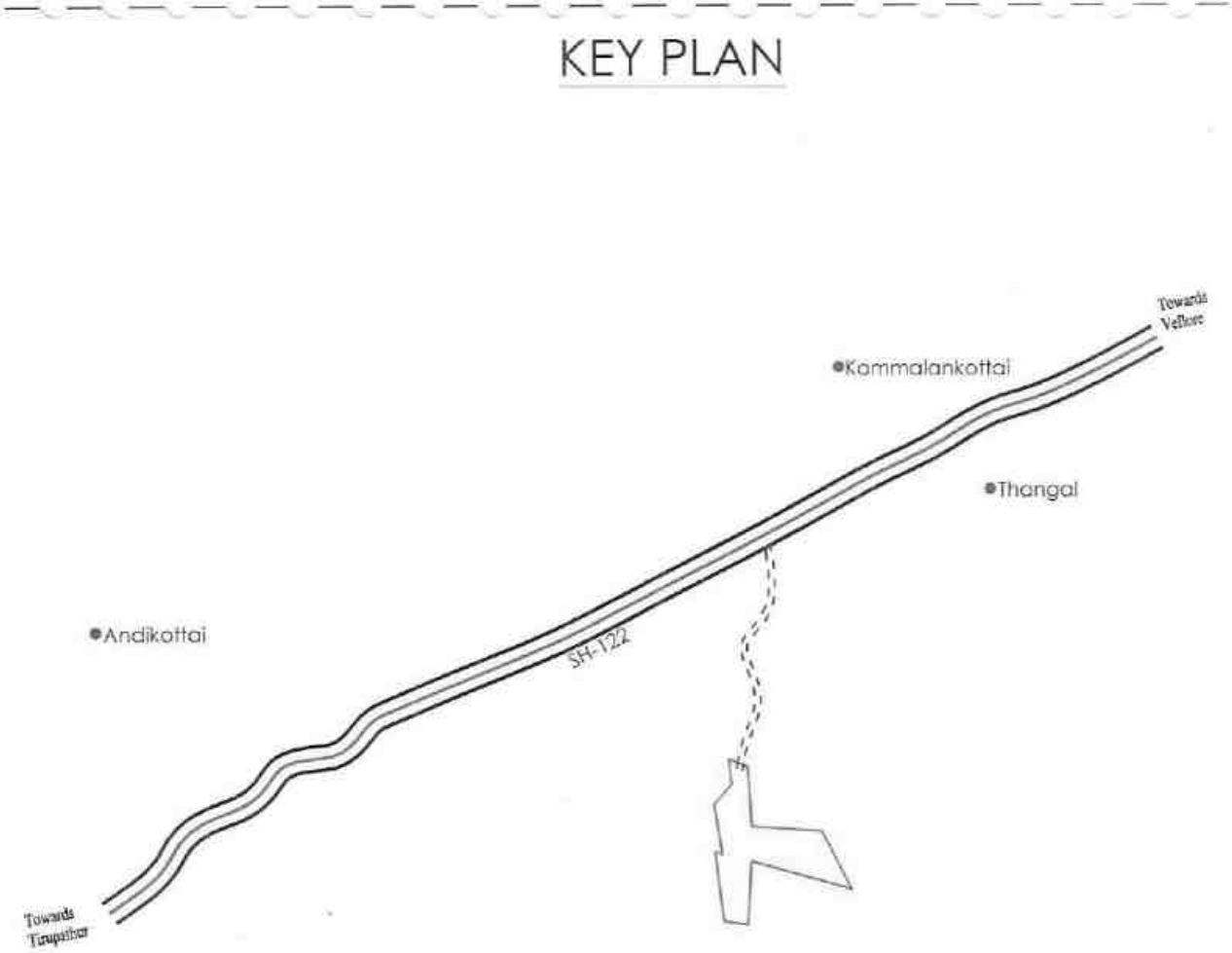


PLATE NO:I-D

DATE OF SURVEY: 29.12.2023

APPLICANT:

THIRU.R.NATARAJAN,
S/O.RANGASAMY,
NO:14, AYYAGOUNDARPATTI,
KOLLAMANGALAM VILLAGE,
GUDIYATHAM TALUK,
VELLORE DISTRICT.

QUARRY LEASE APPLIED AREA:

S.F.NO's : 253/7, 259/5, 259/2 & 259/4,
EXTENT : 2.31.50 Ha,
VILLAGE : KARADIKUDI,
TALUK : ANAICUT,
DISTRICT : VELLORE.

INDEX

Q.L.APPLIED AREA	
STATE HIGHWAY	
APPROACH ROAD	
HABITATIONS	

KEY PLAN

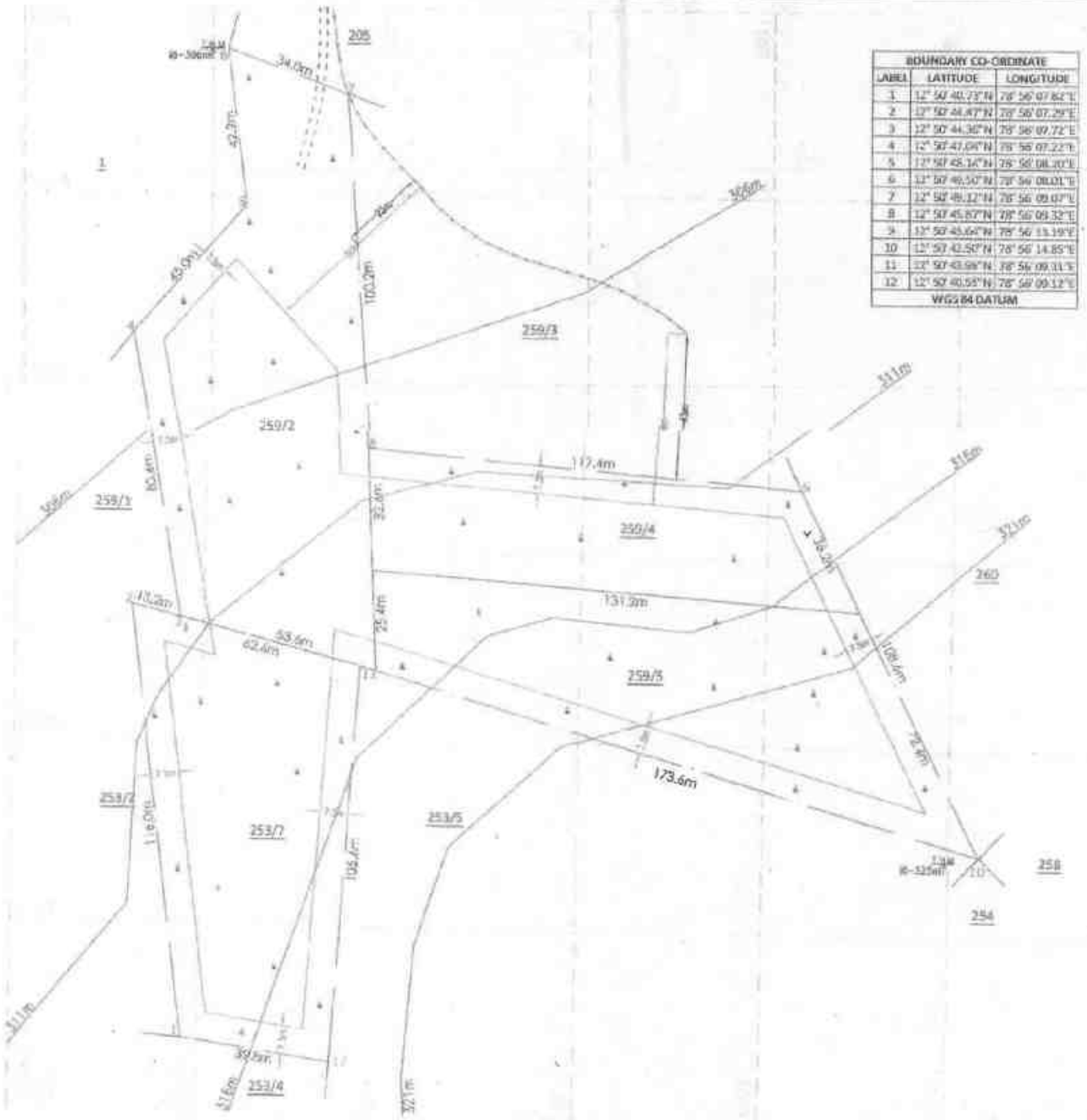
Not To Scale

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.

C.NATARAJAN,M.Sc.,M.Phil.,
QUALIFIED PERSON

O/o. ASSISTANT DIRECTOR GEOLOGY & MINING VELLORE



BOUNDARY CO-ORDINATE		
LABEL	LATITUDE	LONGITUDE
1	12° 50' 40.73"N	78° 56' 07.82"E
2	12° 50' 44.47"N	78° 56' 07.29"E
3	12° 50' 44.30"N	78° 56' 09.72"E
4	12° 50' 47.04"N	78° 56' 07.22"E
5	12° 50' 48.14"N	78° 56' 08.20"E
6	12° 50' 46.50"N	78° 56' 08.01"E
7	12° 50' 46.12"N	78° 56' 09.07"E
8	12° 50' 45.87"N	78° 56' 09.32"E
9	12° 50' 45.64"N	78° 56' 13.19"E
10	12° 50' 42.50"N	78° 56' 14.85"E
11	12° 50' 43.58"N	78° 56' 09.31"E
12	12° 50' 40.55"N	78° 56' 09.12"E
WGS 84 DATUM		

N

PLATE NO-II

DATE OF SURVEY : 29.12.2023

APPLICANT:

THIRU.R.NATARAJAN
S/O.RANGASAMY,
NO:14, AYYAGOUNDANPATTI,
KOLLAMANGALAM VILLAGE,
GUDIYATHAM TALUK,
VELLORE DISTRICT.

QUARRY LEASE APPLIED AREA:

S.F.NO's : 253/7, 259/3, 259/2 & 259/4.
EXTENT : 2.31.50 Ha,
VILLAGE : KARADIKUDI,
TALUK : ANAICUT,
DISTRICT : VELLORE.

INDEX

Q.L.APPLIED BOUNDARY
7.5m & 50m SAFETY DISTANCE
TEMPORARY BENCH MARK
APPROACH ROAD
CONTOUR
SCRUB
ODAI

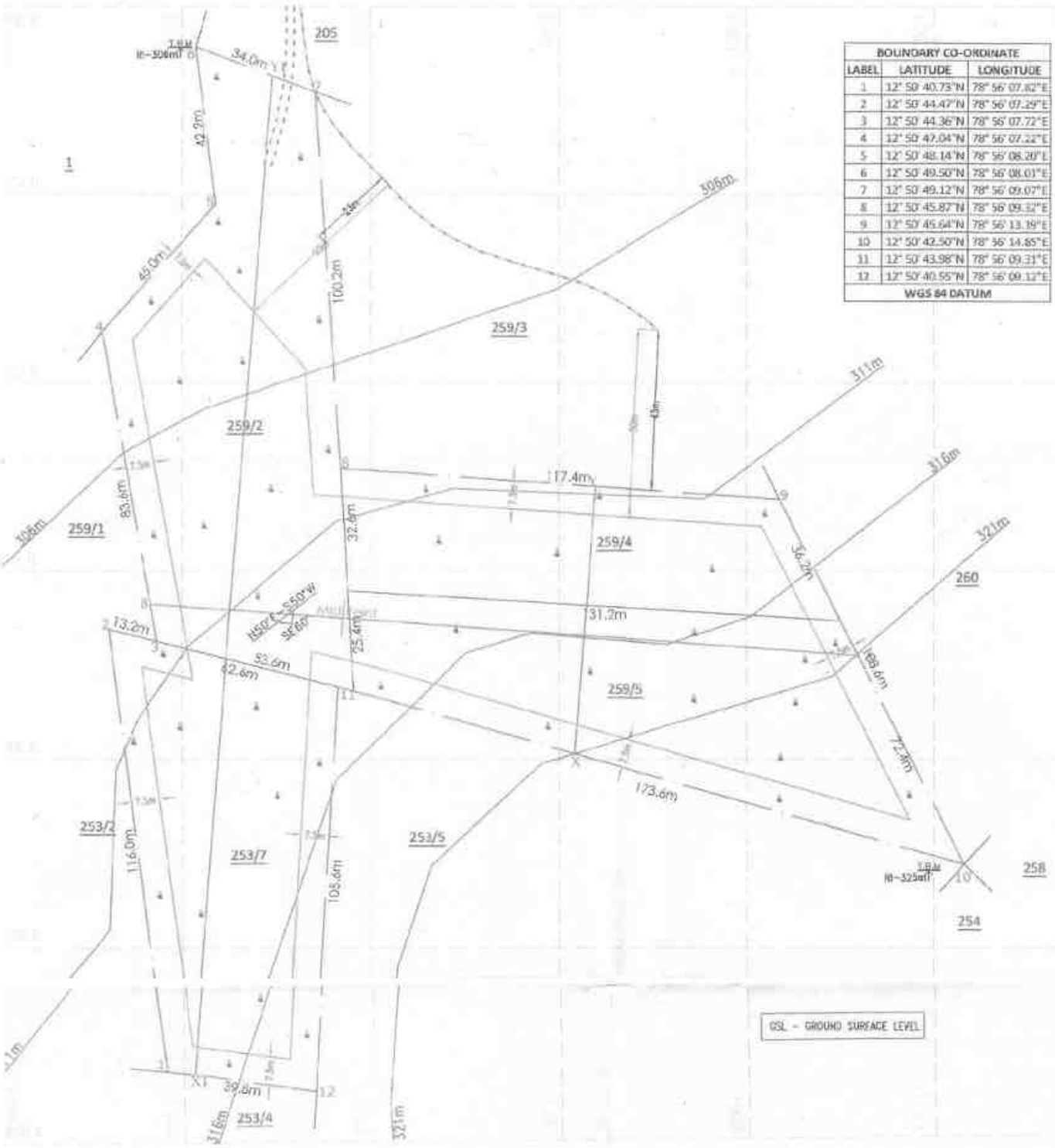
QUARRY LEASE & SURFACE PLAN

SCALE 1 : 1000

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

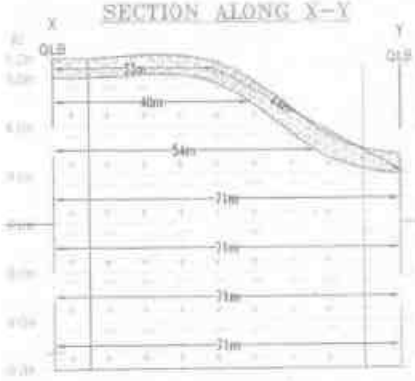
C.MUTHUKRISHNAN, M.Sc.,B.Ed.,
QUALIFIED PERSON



BOUNDARY CO-ORDINATE		
LABEL	LATITUDE	LONGITUDE
1	12° 50' 40.73"N	78° 56' 07.82"E
2	12° 50' 44.47"N	78° 56' 07.29"E
3	12° 50' 44.36"N	78° 56' 07.72"E
4	12° 50' 47.04"N	78° 56' 07.22"E
5	12° 50' 48.14"N	78° 56' 08.20"E
6	12° 50' 49.50"N	78° 56' 08.01"E
7	12° 50' 49.12"N	78° 56' 09.07"E
8	12° 50' 45.87"N	78° 56' 09.32"E
9	12° 50' 45.64"N	78° 56' 13.19"E
10	12° 50' 42.50"N	78° 56' 14.85"E
11	12° 50' 43.98"N	78° 56' 09.31"E
12	12° 50' 40.55"N	78° 56' 09.12"E
WGS 84 DATUM		

GSL - GROUND SURFACE LEVEL

SECTION ALONG X-Y



SECTION ALONG A-B



SECTION ALONG X1-Y1

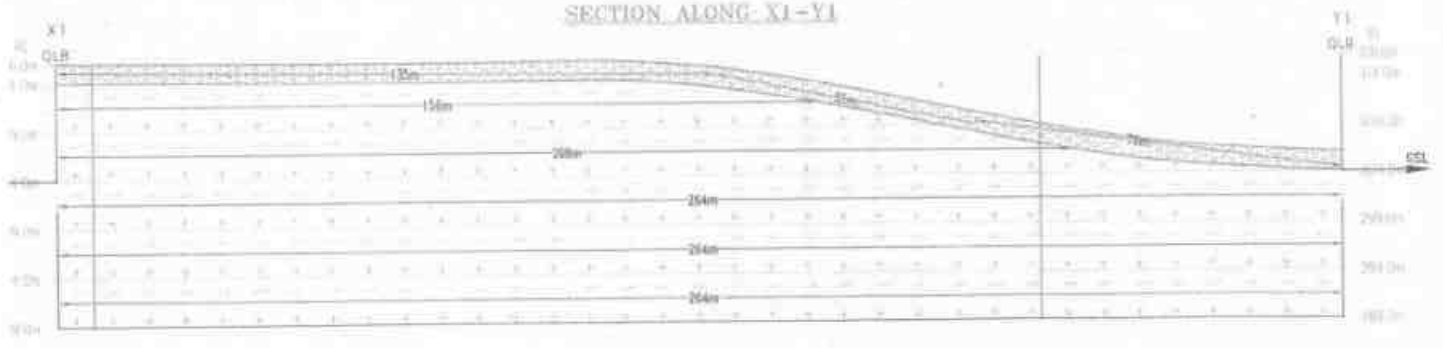


PLATE NO-III

DATE OF SURVEY : 29.12.2023

APPLICANT:

THIRU.K.NATARAJAN,
S/O RANGAMMY,
NO:34, AYYAGOUNDARPATTI,
KOLLAMANGALAM VILLAGE,
GUDIYATHAM TALUK,
VELLORE DISTRICT.

QUARRY LEASE APPLIED AREA:

S.F.NO's : 253/7, 259/5, 259/2 & 259/4.
EXTENT : 2.31.50 Ha,
VILLAGE : KARADIKUDI,
TALUK : ANAICUT,
DISTRICT : VELLORE.

INDEX

Q.L APPLIED BOUNDARY	
7.5m & 50m SAFETY DISTANCE	
TEMPORARY BENCH MARK	TBM
APPROACH ROAD	
CONTOUR	
SCRUB	
GRAVEL	
ROUGH STONE	
STRIKE &DIP	
ODAI	

TOPOGRAPHY,GEOLOGICAL, PLAN & SECTION

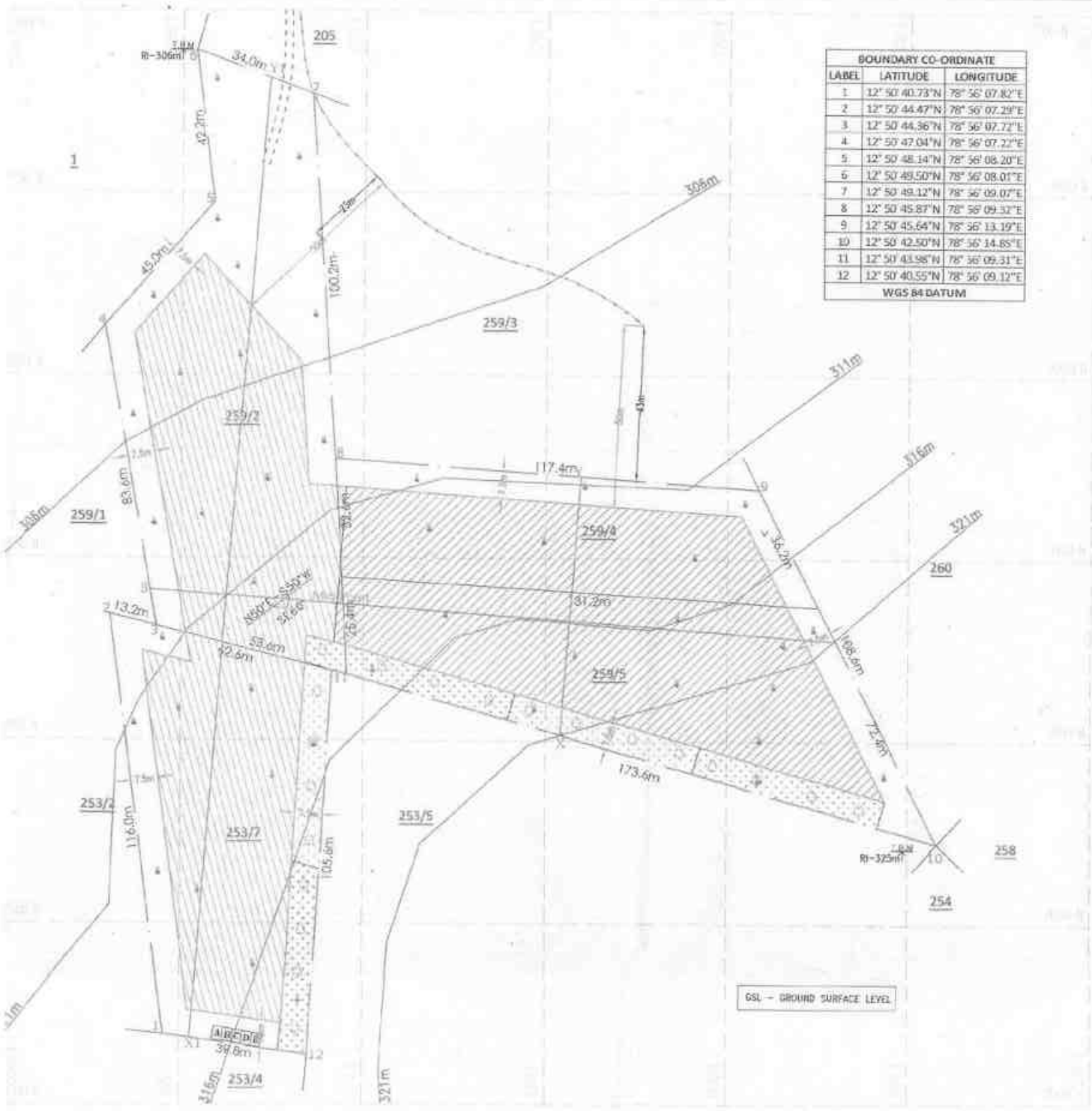
SCALE 1 : 1000

SECTION HOR 1 : 1000, VER 1: 500

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

CHATARAJAN.K.M.Sc.,
QUALIFIED PERSON



BOUNDARY CO-ORDINATE		
LABEL	LATITUDE	LONGITUDE
1	12° 50' 40.73"N	78° 56' 07.82"E
2	12° 50' 44.47"N	78° 56' 07.29"E
3	12° 50' 44.36"N	78° 56' 07.72"E
4	12° 50' 47.04"N	78° 56' 07.22"E
5	12° 50' 48.14"N	78° 56' 08.20"E
6	12° 50' 49.50"N	78° 56' 08.01"E
7	12° 50' 49.12"N	78° 56' 09.07"E
8	12° 50' 45.87"N	78° 56' 09.32"E
9	12° 50' 45.64"N	78° 56' 13.19"E
10	12° 50' 42.50"N	78° 56' 14.85"E
11	12° 50' 43.98"N	78° 56' 09.31"E
12	12° 50' 40.55"N	78° 56' 09.12"E
WGS 84 DATUM		

PROPOSED SITE SERVICES

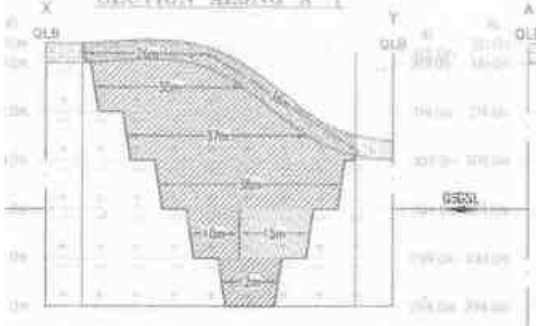
A – OFFICE
B – STORE ROOM
C – FIRST AID ROOM
D – REST SHELTER
E – TOILET
M – MAGAZINE

PRESENT & POST LAND USE PATTERN

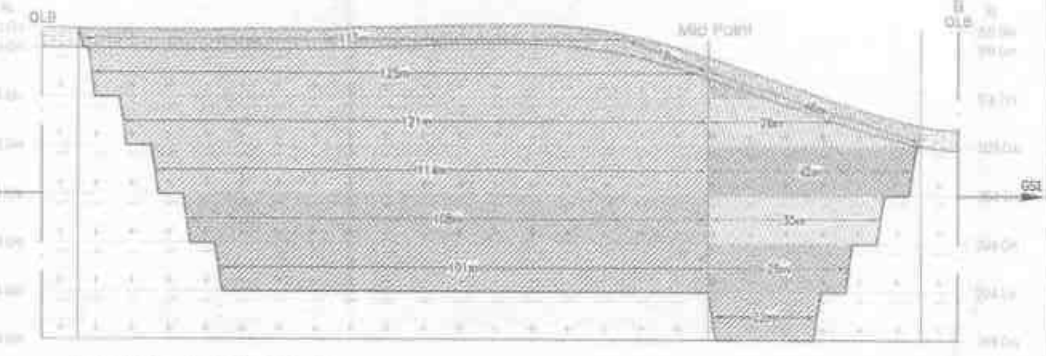
DESCRIPTION	PRESENT AREA (Ha)	AREA AT THE END OF THIS QUARRYING PERIOD (Ha)
AREA UNDER QUARRYING	NIL	1.50.20
INFRASTRUCTURE	NIL	0.01.00
ROADS	NIL	0.01.00
GREEN BELT	NIL	0.20.00
UN-UTILIZED AREA	2.31.50	0.59.30
GRAND TOTAL	2.31.50	2.31.50

1st year Proposed area to be Quarried
2nd year Proposed area to be Quarried
3rd year Proposed area to be Quarried
4th year Proposed area to be Quarried
5th year Proposed area to be Quarried
1st year Proposed area to be Planted
2nd year Proposed area to be Planted
3rd year Proposed area to be Planted
4th year Proposed area to be Planted
5th year Proposed area to be Planted

SECTION ALONG X-Y



SECTION ALONG A-B



SECTION ALONG X1-Y1

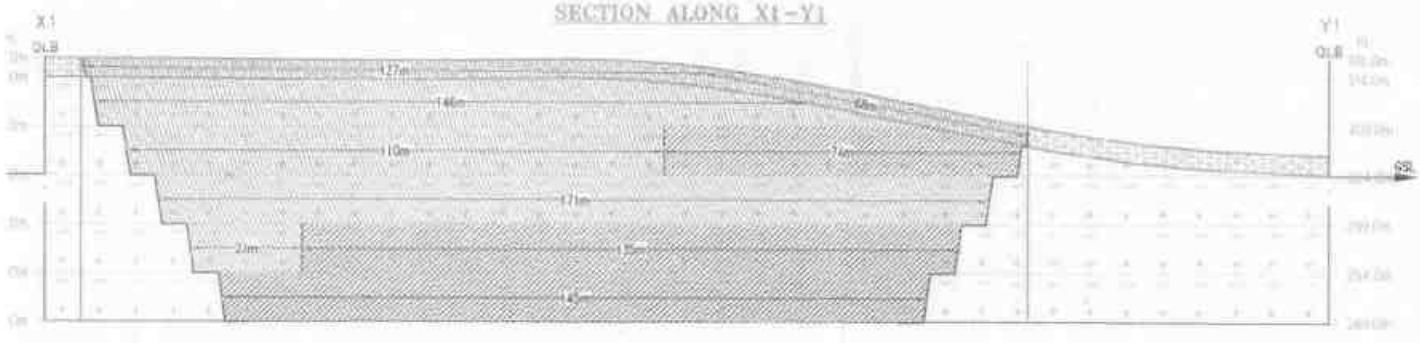


PLATE NO-IV

DATE OF SURVEY : 29.12.2023

APPLICANT:

THIRU.E.NATARAJAN,
S/O.RANGASAMY,
NO:14, AYYAGOUNDANPATTI,
KOTLAMANGALAM VILLAGE,
GUDIYATHAM TALUK,
VELLORE DISTRICT.

QUARRY LEASE APPLIED AREA:

S.F.NO's : 253/7, 259/5, 259/2 & 259/4,
EXTENT : 2.31.50 Ha.
VILLAGE : KARADIKUDI,
TALUK : ANAICUT.
DISTRICT : VELLORE.

INDEX

- Q.L.APPLIED BOUNDARY
- 7.5m & 50m SAFETY DISTANCE
- TEMPORARY BENCH MARK (T.B.M)
- APPROACH ROAD
- CONTOUR
- SCRUB
- GRAVEL
- ROUGH STONE
- STRIKE & DIP
- ODAI

MINEABLE, YEARWISE DEVELOPMENT & PRODUCTION PALN & SECTION

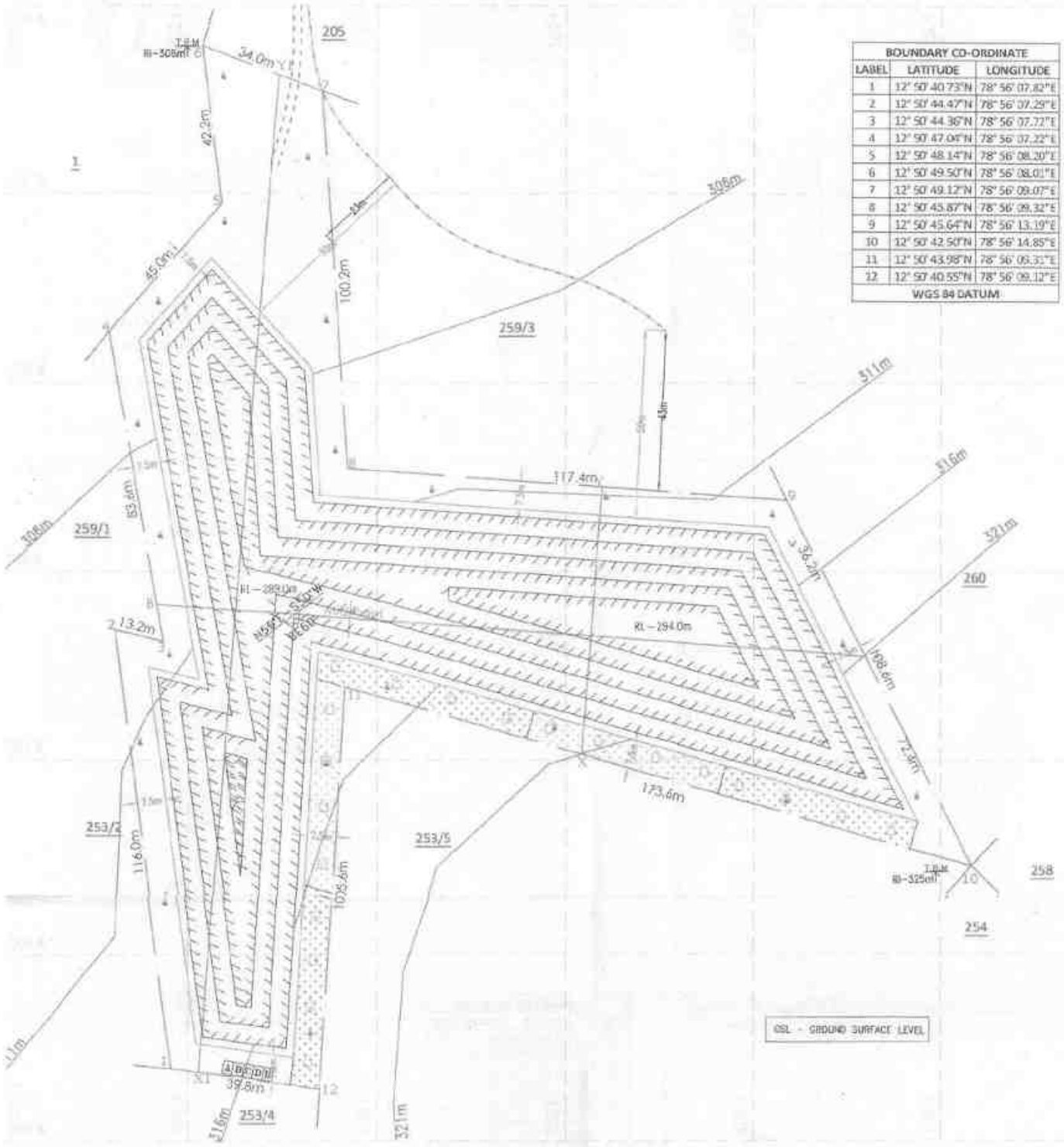
SCALE 1 : 1000

SECTION HOR 1 : 1000, VER 1: 500

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

NATARAJAN M.SC.(GEO)
QUALIFIED PERSON



BOUNDARY CO-ORDINATE		
LABEL	LATITUDE	LONGITUDE
1	12° 50' 40.73"N	78° 56' 07.82"E
2	12° 50' 44.47"N	78° 56' 07.29"E
3	12° 50' 44.36"N	78° 56' 07.72"E
4	12° 50' 47.04"N	78° 56' 07.22"E
5	12° 50' 48.14"N	78° 56' 08.20"E
6	12° 50' 49.50"N	78° 56' 08.01"E
7	12° 50' 49.12"N	78° 56' 09.07"E
8	12° 50' 45.87"N	78° 56' 09.32"E
9	12° 50' 45.64"N	78° 56' 13.19"E
10	12° 50' 42.50"N	78° 56' 14.85"E
11	12° 50' 43.98"N	78° 56' 05.31"E
12	12° 50' 40.55"N	78° 56' 09.12"E
WGS 84 DATUM		

PROPOSED SITE SERVICES

A – OFFICE
B – STORE ROOM
C – FIRST AID ROOM
D – REST SHELTER
E – TOILET
M – MAGAZINE

1st year Proposed area to be Planted
2nd year Proposed area to be Planted
3rd year Proposed area to be Planted
4th year Proposed area to be Planted
5th year Proposed area to be Planted

ULTIMATE PIT DIMENSION
L195m(MAX)XW77m(Avg)X32m(d)(Max)
17m(Above ground level)
15m(Below ground level)

PLATE NO-V

DATE OF SURVEY : 29.12.2023

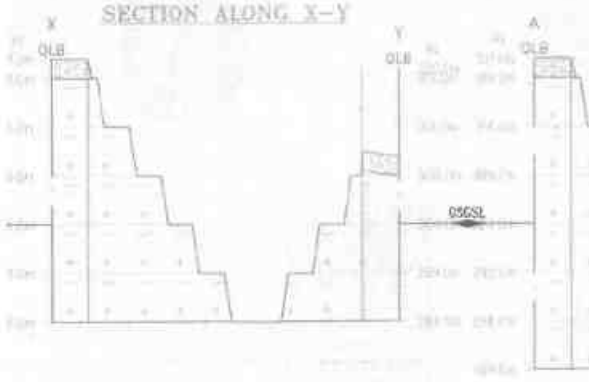
APPLICANT:
THIRU.NATARAJAN,
VOYANGASAMY,
NO.14, ANNAIGOUNDARPATTI,
KOLLAMANGALAM VILLAGE,
GUDIYATHAM TALUK,
VELLORE DISTRICT

QUARRY LEASE APPLIED AREA:
S.F.NO's : 253/7, 259/5, 259/2 & 259/4,
EXTENT : 2.31.50 Hs.
VILLAGE : KARADIKUDI,
TALUK : ANAICUT,
DISTRICT : VELLORE

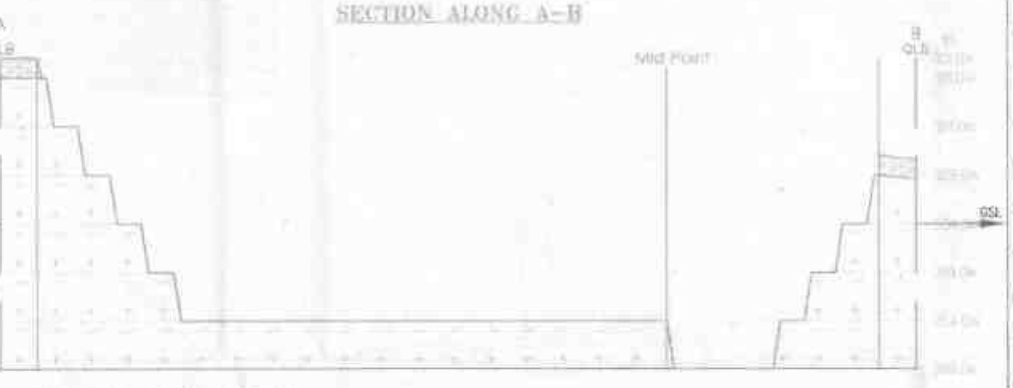
INDEX

Q.L.APPLIED BOUNDARY
7.5m & 50m SAFETY DISTANCE
TEMPORARY BENCH MARK
APPROACH ROAD
CONTOUR
SCRUB
GRAVEL
ROUGH STONE
STRIKE &DIP
PROPOSED QUARRY PIT
ODAI

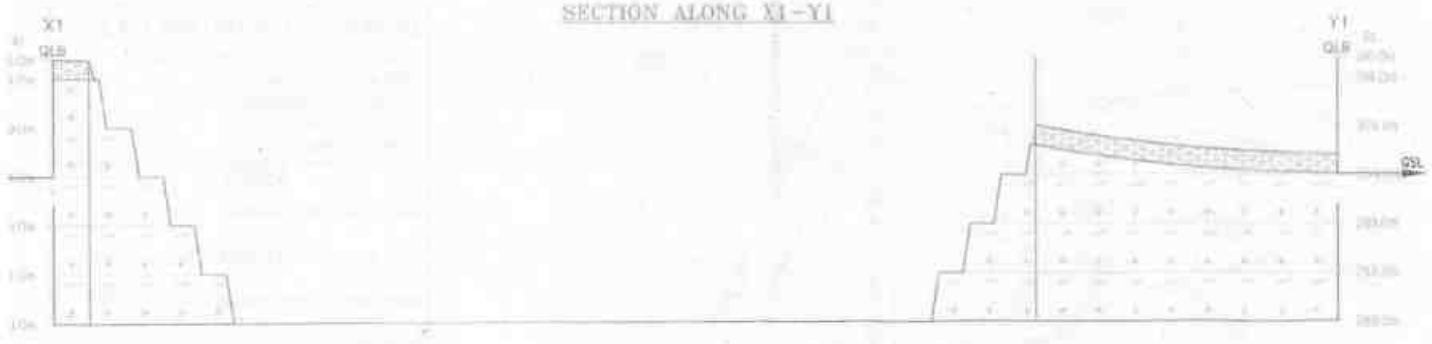
SECTION ALONG X-Y



SECTION ALONG A-B



SECTION ALONG X1-Y1



CONCEPTUAL PLAN & SECTION

SCALE 1 : 1000
SECTION HOR 1 : 1000, VER 1 : 500

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

C.NATARAJAN,M.Sc.,M.Phil
QUALIFIED PERSON

ANNEXURE-4

From

Thiru.D.Bernard. M.Sc.,
Assistant Director,
Geology and Mining,
Vellore District.

To

Thiru.R.Natarajan
S/o.Rangasamy
147, Kollamangalam Village,
Gudiyatham Taluk,
Vellore District.

Rc.No.72/2022 (Mines) Date 13 .01.2023

Sir,

Sub: Mines and Minerals – Minor Mineral – Vellore District – Anaicut Taluk – Karadikudi Village – SF.Nos.253/7, 259/5, 259/2 & 259/4 – over an extent of 2.31.50 hectares of patta land–Quarry lease application preferred by Thiru.R.Natarajan S/o.Rangasamy - Precise area communicated - Draft Mining plan submitted– Approved – Certificate requested - Regarding.

Ref: 1. Application of Thiru.R.Natarajan dated 13.05.2022.
2. The applicant letter dated 13.01.2023.

****

In the reference first cited, Thiru.R.Natarajan S/o.Rangasamy, No.147 Ayyagoundarpatti, Kollamangalam Village, Gudiyatham Taluk, Vellore District applied for grant of lease for quarrying Rough stone and Gravel over an extent of 2.31.50 hectares of patta land in SF.Nos.253/7, 259/5, 259/2 & 259/4 of Karadikudi Village, Anaicut Taluk, Vellore District for a period of 5 years under Rule 19 & 20 of Tamil Nadu Minor Mineral Concession Rules, 1959.

In this reference 2nd cited Thiru.R.Natarajan S/o.Rangasamy applicant of the proposed stone quarry has requested to furnish the details of existing, abandoned and proposed quarries situated within 500mts radius from the subject quarry.

Accordingly, the above details are furnished below.

1) Existing Quarries :

Sl. No.	Name of the Lessee / Permit Holder	Village & Taluk	S.F. No.	Extent in hects,	Lease Period
1.	S.Sumathi	Anaicut Karadikudi	252/5	1.29.5	15.03.2018 To 14.03.2023
2.	C.Venkatesan	Anaicut Karadikudi	147/11	1.10.0	18.04.2018 To 17.04.2023

3.	D.Sivakumar	Anaicut Karadikudi	258/8	0.33.5	11.02.2019 To 10.02.2024
4.	T.Balachandar	Anaicut Karadikudi	253/6	0.44.0	05.07.2021 To 04.07.2026

2) Expired Quarries :

Sl. No.	Name of the Lessee / Permit Holder	Village & Taluk	S.F. No.	Extent in hect,	Lease Period
1.	D.Sivakumar	Anaicut Karadikudi	425/11	1.24.5	20.10.2014 To 19.10.20219
2.	R.Natarajan	Anaicut Karadikudi	254/4	0.34.0	10.05.2017 To 09.05.2022

3) Abandoned Quarries :

Sl. No.	Name of the Lessee / Permit Holder	Village & Taluk	S.F.No.	Extent in hect,	Remarks
1.	K.Giridharan	Anaicut Karadikudi	242/2,4, 8 & 6A	1.36.0	07.06.2010 To 06.06.2015
2.	R.Natarajan	Anaicut Karadikudi	246/1, 251/3A, 253/4	2.69.0	18.07.2011 To 17.07.2016

4) Present Proposed Quarries :

Sl. No	Name of the Lessee /Permit Holder	Village & Taluk	S.F. No.	Extent in hects,	Lease Period
1.	K.Munisamy	Anaicut Karadikudi	255/2,7 & 358/2	2.15.5	-
2.	R.Natarajan	Anaicut Karadikudi	251/3A	1.05.5	-
3.	R.Natarajan	Anaicut Karadikudi	253/7, 259/2,4 & 5	2.31.5	-
4.	Tmt.Kasthuri	Anaicut Karadikudi	253/4	1.64.0	-

13/01/25

Assistant Director,
Geology and Mining,
Vellore District.

13/1/25

ANNEXURE-5

10/02/2023
கரடிகுடி

வேலூர் மாவட்டம், குடியாத்தம் வட்டம், கொல்லமங்களம் கிராமம் NO.26, அய்யாவு கவுண்டர் பட்டியை சேர்ந்த R.நடராஜன் த/பெ ரங்கசாமி கவுண்டர் என்பவர் அணைக்கட்டு வட்டம், கரடிகுடி கிராமம் புல எண் : 253/7 0.53.5 – ஏர்ஸ், 259/5 0.62.5, 259/2 0.77.5, 259/4 0.38.0 – ஏர்ஸ், ஆக மொத்தம் 2.31.5 ஹெக்டர் பட்டா நிலத்தில் கல், மண் (ம) கிராவல் குவாரி செய்ய அனுமதி கோரி மனுச் செய்துள்ளார். மேற்படி புலஎண் நிலத்தை சுற்றி 300 மீ சுற்று அளவில் குடியிருப்புகள் வீட்டு மனை பகுதிகள் புரதான சின்னங்கள், பள்ளிகள், வரலாற்று சின்னங்கள், பழந்தமிழர் கல்வெட்டுகள், சமான படுகைகள் தொல்பொருள் தளங்கள் எதுவும் இல்லை. மேற்படி புலத்திலிருந்து சுமார் 50 மீ சுற்று அளவில் நீர்நிலைகள், கிராமச் சாலைகள் எதுவும் இல்லையென்று கள விசாரணையில் தெரிய வருகிறது என்பதை பணிவுடன் தெரிவித்துக்கொள்கிறேன்.

சு. சிவனி
கிராம நிர்வாக அலுவலர்
11, கரடிகுடி,
12, ஓங்கப்பாடி,
அணைக்கட்டு (வ), வேலூர் (மா.வ)

ANNEXURE-6

ANNEXURE II

Dist: Vellore

Taluk: Arcot

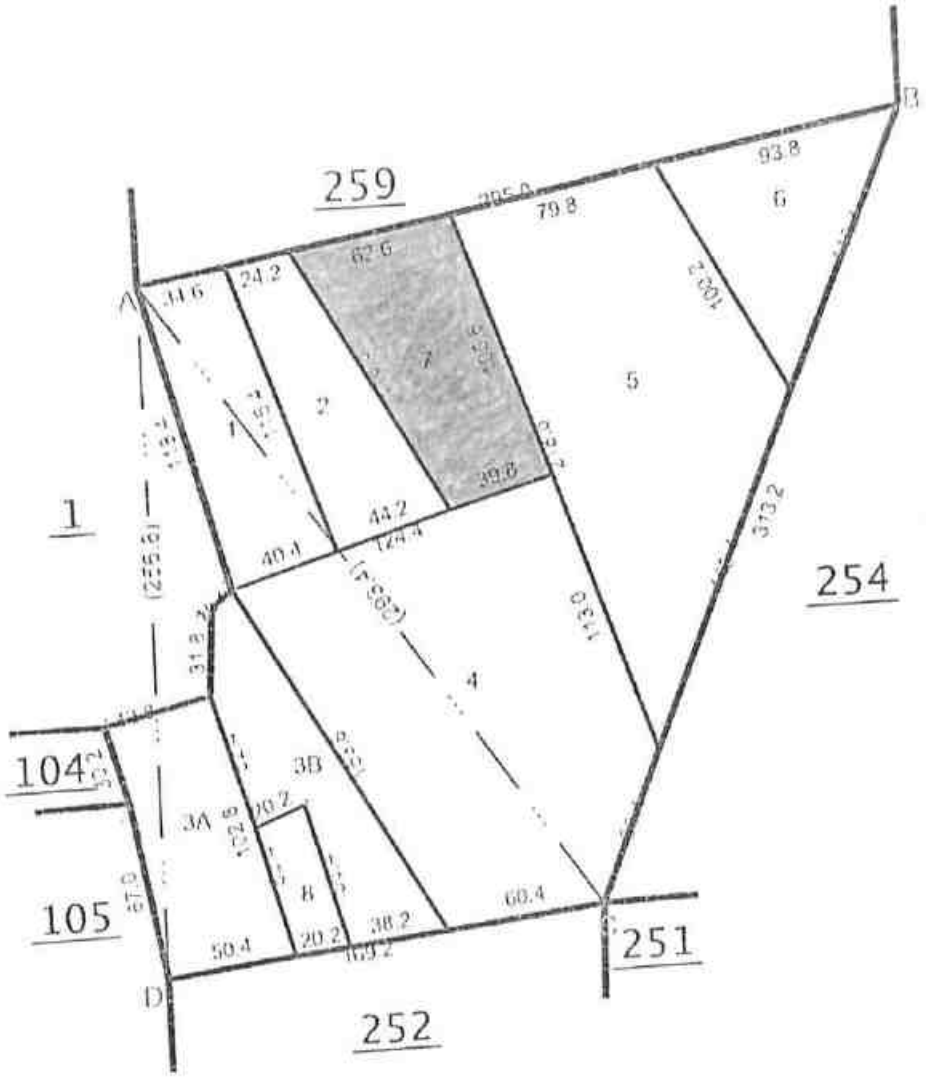
Village: Kavanthandal [B]

Survey No: 253

Area: Hect 05 Ares 91.00

Scale: 1: 2548

D.D. ASSISTANT DIRECTOR MINING VELLORE



LEASE APPLIED AREA

Scanned with CamScanner

District : Vellore

Taluk : Anaicut

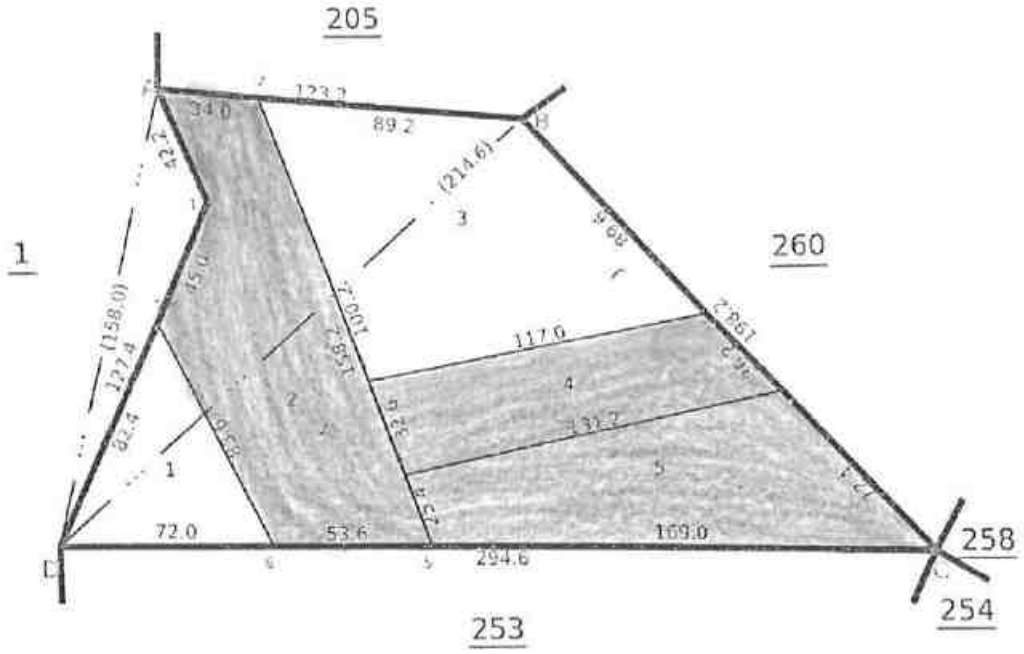
Village : Karadikudi [8]

Survey No : 259

Area : Hect 02 Ares 87.50

Scale : 1 : 2255

ASSISTANT DIRECTOR • DWMA • VELLORE



LEASE APPLIED AREA

Date of Issue: 28-07-2021 15:33:16

mv.240

Survey and Settlement Department, Government of TamilNadu

Scanned with CamScanner


RESERVE
LEASE APPLIED AREA
ANNEXURE
Parasheri
KARAIKUDI
Burgandhiru Tippal 50 Feet high Visible 2 Miles round
Parasheri

ANNEXURE IV

ASSISTANT DIRECTOR VELLORE

தமிழக அரசு

வருவாய்த் துறை

நில உரிமை விபரங்கள் : இ. எண் 10(1) பிரிவு

மாவட்டம் : வேலூர் வட்டம் : அணைக்கட்டு

வருவாய் கிராமம் : கரடிகுடி பட்டா எண் : 757

உரிமையாளர்கள் பெயர்

1. ரங்கசாமி மகன் நடராசன்

புல எண்	உட்பிரிவு	புன்செய்		நன்செய்		மற்றவை		குறிப்புரைகள்
		பரப்பு	நீர்வை	பரப்பு	நீர்வை	பரப்பு	நீர்வை	
		ஹெக் - ஏர்	ரூ - பை	ஹெக் - ஏர்	ரூ - பை	ஹெக் - ஏர்	ரூ - பை	
104	3	0 - 37.50	0.99	--	--	--	--	---- -- 31-07-2015
252	3	0 - 34.50	0.90	--	--	--	--	---- -- 05-10-2005
252	4	0 - 44.50	1.17	--	--	--	--	---- -- 13-01-2005
252	6	0 - 19.50	0.51	--	--	--	--	---- -- 05-10-2005
252	7	0 - 20.00	0.52	--	--	--	--	---- -- 05-10-2005
252	8	0 - 12.00	0.32	--	--	--	--	---- -- 05-10-2005
253	7	0 - 53.50	1.40	--	--	--	--	---- -- 05-10-2005
254	1	0 - 25.00	0.66	--	--	--	--	2019/0103/04/152111- -- -- 19-10-2019
254	10	0 - 33.00	0.86	--	--	--	--	---- -- 05-10-2005
254	8	0 - 18.00	0.48	--	--	--	--	---- -- 13-01-2005
254	9	0 - 15.50	0.40	--	--	--	--	---- -- 05-10-2005
259	5	0 - 62.50	1.63	--	--	--	--	---- -- 05-10-2005
		3 - 75.50	9.84					

குறிப்பு2 :

1. மேற்கண்ட தகவல் / சான்றிதழ் நகல் விவரங்கள் மின் பதிவேட்டிலிருந்து பெறப்பட்டவை. இவற்றை தாங்கள் **https://eservices.tn.gov.in** என்ற இணைய தளத்தில் **04/10/008/00757/110879** என்ற குறிப்பு எண்ணை உள்ளீடு செய்து உறுதி செய்துகொள்ளவும்.
2. இத் தகவல்கள் 21-03-2022 அன்று 02:21:32 PM நேரத்தில் அச்சடிக்கப்பட்டது.
3. கைப்பேசி கேமராவின்2D barcode படிப்பான் மூலம் படித்து 3G/GPRS வழி இணையதளத்தில் சரிபார்க்கவும்

Scanned with CamScanner

தமிழக அரசு

வருவாய்த் துறை

நில உரிமை விபரங்கள் : இ. எண் 10(1) பிரிவு

மாவட்டம் : வேலூர் வட்டம் : அணைக்கட்டு

வருவாய் கிராமம் : கரடிகுடி பட்டா எண் : 943

உரிமையாளர்கள் பெயர்

1. ரங்கசாமி கவுண்டர் மகன் நடராஜன்

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	
259	2	0 - 77.50	2.04	--	--	--	--	2019/0103/04/152111- -- -- 19-10-2019
259	4	0 - 38.00	1.00	--	--	--	--	2016/0103/04/010292- -- -- 27-09-2016
		1 - 15.50	3.04					

குறிப்பு2 :

1. மேற்கண்ட தகவல் / சான்றிதழ் நகல் விவரங்கள் மின் பதிவேட்டிலிருந்து பெறப்பட்டவை. இவற்றை தாங்கள் **https://eservices.tn.gov.in** என்ற இணைய தளத்தில் **04/10/008/00943/130836** என்ற குறிப்பு எண்ணை உள்ளீடு செய்து உறுதி செய்துகொள்ளவும்.
2. இத் தகவல்கள் 21-03-2022 அன்று 03:09:43 PM நேரத்தில் அச்சடிக்கப்பட்டது.
3. கைப்பேசி கேமராவின்2D barcode படிப்பான் மூலம் படித்து 3G/GPRS வழி இணையதளத்தில் சரிபார்க்கவும்

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ANNEXURE V

432 – ஆம் பசலியில் வேலூர் மாவட்டம் அணைக்கட்டுவட்டம் கிராமத்திற்காக

ASSISTANT DIRECTOR GEOLOGY & MINING

நில வரித் திட்டத்தின்படி புலன்களின் விபரம்.					கைப்பற்று தாரருடைய பெயரும் எண்ணும் அல்லது அனுபோக தாரருடைய பெயர்.	சாகுபடியாளியின் பெயர்.	முதல் போகம்.				
நில அளவை எண்.	உட்பிரிவு எண்.	பரப்பு.	தீர்வை.	ஒரு போகம் அல்லது இரு போகம்.		நிலத்தின் எந்த பகுதி யாவது சாகுபடியாளரால் பயிரிடப்பட்டுள்ளதா.	எந்த மாதத்தில் பயிர் செய்யப்பட்டது எந்த மாதத்தில் அறுவடை செய்யப்பட்டது.	பயிரின் பெயர்.	பயிராக / அறுவடை யான பரப்பு.	உண்மையான பாய்ச்சல் ஆதாரம்.	விளைச்சல் அளவு விபரம்.
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
253	7	0.53.5	1.40	757	நடராசன்	ஆம்					
									உண்மையானது		
									07.5		

Village Administrative Officer
11/Kaikal
12. Ongapadi
Anaicut Taluk, Vellore District

TAHSILDAR
ANAICUT.

8/7/22

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1132 – ஆம் பசலியில் வேலூர் மாவட்டம் அணைக்கட்டு வட்டம் 11. காட்பாடி

நில அளவை எண் (1)	உட்பிரிவு எண். (2)	மாப்பு (3)	ரிர்காலை. (4)	ஒரு போகம் அல்லது இரு போகம். (5)	கைம்பற்று தாருடைய பெயரும் எண்ணும் அல்லது அனுபோக தாருடைய பெயர். (6)	ஏரிகுளம் வாய்க்கால் போன்ற பொதுப் பயன்பாட்டில் உள்ள புறம்போக்கு நிலமாயின் அதன் பெயர். (7)	முதல் போகம். (8)	(9)	(10)	(11)	(12)
259	2	0.77.5	2.4	943	நடராஜன்	நிரை			உள்ளாமருதம்		

Village Administrative Officer
11. Kaladikudi
12. Ongapadi
Anaicut Taluk, Vellore District

8/7/22

380/26-R.F. III-A-10-50,00,000 Cps.-GBP.-Mdu-7-2018.

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ASSISTANT DIRECTOR
VELLORE
GEOLOGY & MINING

கிராமம் ... வட்டம் அணைக்கட்டு வட்டம் மாவட்டம் வேலூர்

32 - ஆம் பகுதியில்

நில வரித் திட்டத்திற்படி புலங்களின் விபரம்.					சர்வேயர் தரைப்படம் பெறும் வரையில் அதன் தற்போதைய நிலைமை பற்றி	காலப்பயிர் பார்வை	முதல் போகம்.				
நில அளவை எண்	உட்பிரிவு எண்	பரப்பு	தீர்வை	ஒரு போகம் அல்லது நிரை போகம்		நிலத்தில் எந்த வகையான பயிர் எவ்வளவு காலமாக பயிரிடப் பட்டுள்ளது.	எந்த வகையில் பயிர் செய்யப்பட்டுள்ளது. (மானாவாரி அல்லது நன்செய்)	பயிரின் பெயர்.	பயிரை அனுபவிப்பவர் பெயர் மற்றும் முகவரி	உரிமையாளர் அல்லாத பாத்தியம் உள்ளோர்.	விவசாயம் அல்லாத விபரம் (குறிப்பு)
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
259	4	038.0	1.0	943	சுடாரைஸ்	ஒன்று			உரிமையாளர்		

Village Administrative Officer
M. Kandigaikudi
12. Ongappadi
Anaicut Taluk, Vellore District

8/7/22

380/26-R.F. III-A-10-50,00,000 Cps.-GBP.-Mdu-7-2018.

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கிராமம் வட்டம் மாவட்டம்

நில வரிசை எண். (1)	உட்பிரிவு எண். (2)	பரப்பு. (3)	தீர்வை. (4)	ஒரு போகம் அல்லது இரு போகம் (5)	(6)	வைப்பு மானியம் கோரல் (7)	முதல் போகம்.				
							காஞ்சி மாவட்டத்தில் பின்னர் தெரியவரும் ஏதேனும் மறைந்துள்ள கனிமங்கள் தொடர்பான (8)	பயிரின் பெயர். (9)	பயிரை / அறுவடை யான பரப்பு. (10)	உள்ளபடியான பாய்ச்சல் ஆதாரம். (11)	விளைச்சல் ஏதேனும் விபரக்கூறு. (12)
259	5	0.62.5	1.63	757	நடராசன்	நிரு			1 மாமரங்கள்		

07.5

Village Administrative Officer
11. Kandikuppam
12. Ongapadi
Arcot Taluk, Vellore District

TAHSILDAR
ARCOT

ASSISTANT DIRECTOR
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ANNEXURE
ASSISTANT DIRECTOR
GEOLOGY & MINING
VELLORE

கி. எண். 8. காஞ்சிபுரம்.

1	2	3	4	5	6	7	8	9	10	11	12			
							ஒ.பை	நிலஅ.ஏக்கர்	ஒ.பை					
6	253-6	அ	ப	...	7-4	5	2 62	0 44.5	1 17	.....	அரசாங்கம்	255	5	255
7	-7	ஓ	ப	...	7-4	5	2 62	0 53.5	1 40	287 ஓ.பாப்பம்மாள்			6	
8	-8	ஓ	ப	...	7-4	5	2 62	0 11.0	0 29	57 பெ.காதி ராஜன்.			7	
								5 91.0	15 48					
1	254-1	ஓ	ப	...	7-4	5	2 62	0 25.0	0 65	209 மொ.செல்லியம் மாள்.		256	(1)	256
2	-2	ஓ	ப	...	7-4	5	2 62	0 38.5	1 00	80 குப்பன்.			2	
3	-3	ஓ	ப	...	7-4	5	2 62	0 87.5	2 29	362 ப.முனியம் மாள்.			3	
4	-4	அ	ப	...	7-4	5	2 62	0 34.0	0 89	.....	அரசாங்கம்		(4)	
5	-5	ஓ	ப	...	7-4	6	2 62	0 57.5	1 50	224 தாசப்பதாயுடு.				
6	-6	ஓ	ப	...	7-4	5	2 62	0 18.0	0 47	12 பொ.அயிஷ மாள்.				
7	-7	அ	ப	...	7-4	5	2 62	0 72.5	1 90	.....	அரசாங்கம்		5A	-
8	-8	ஓ	ப	...	7-4	5	2 62	0 18.0	0 48	130 கோவிந்தன்			5B	-
9	-9	ஓ	ப	...	7-4	5	2 62	0 15.5	0 40	574 ப.சின்ன கண்ணு(1), ப.தடராஜன்(2)			5C	-
10	-10	ஓ	ப	...	7-4	5	2 62	0 33.0	0 86	574 ப.சின்ன கண்ணு(1). ப.தடராஜன்(2)			6	-
								3 99.0	10 45	0.005		257	1A	257
1	255-1	ஓ	ப	...	7-4	5	2 62	0 81.5	2 13	52 க.கன்னன்.			1B	-
2	-2	ஓ	ப	...	7-4	5	2 62	0 77.5	2 02	327 மாணிக்கம்.			1C	-
3	-3	ஓ	ப	...	7-4	5	2 62	0 72.0	1 89	574 ப.தடராஜன்(1) ப.சின்ன கண்ணு(2).			1D	-
4	-4	ஓ	ப	...	7-4	5	2 62	0 27.0	0 71	81 ல.குப்ப போயன்.			1E	-

12 கன்னிகாபுரம்

Village Administrative Officer
11. Kangundi
12. Ongapadi
Anaicut Taluk, Vellore District

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1	2	3	4	5	6	7	8	9	10	11
							ஏ. வா.	ஆகாரவரி	ஏ. வா.	
258	10	258-10	ஏ	மி	...	7-4	5	2 62	0 26·0	0 68	669 செ.நீரோ மற்றவர்களுக்கு சொந்தமானது.*
									2 75·0	7 21	
259	1	259-1	ஏ	மி	...	7-4	5	2 62	0 27·5	0 72	683 வா.மாடி மற்றவர்களுக்கு சொந்தமானது.*
	2	-2	ஏ	மி	...	7-4	5	2 62	0 77·5	2 04	642 மி.குப்பன் (1), ம.வெங்கட சேஷ (2), த.மல்லிகா (3).
	3	-3	ஏ	மி	...	7-4	5	2 62	0 82·5	2 14	643 ஏ.சென்னகேசவ ஆந்தி (1), செ.ர. வைபவா (2), ப.ஜெயந்தி (3).
	4	-4	ஏ	மி	...	7-4	5	2 62	0 38·0	1 00	211 ஏ.செங்கம் மாள்
	5	-5	ஏ	மி	...	7-4	5	2 62	0 62·5	1 63	582 செ.மாரிக்க பத்து (1), செ.வரதன் (2).
									2 87·5	7 53	
260	1	260-1	ஏ	மி	...	7-4	5	2 62	0 36·5	1 47	490 ப.ஜெயந்தி.
	2	-2	ஏ	மி	...	7-4	5	2 62	0 22·5	0 59	382 ஆ.சங்கயந்தி.
	3	-3	ஏ	மி	...	7-4	5	2 62	0 70·5	0 54	..... அனாதினம்.
	4	-4	ஏ	மி	...	7-4	5	2 62	0 16·0	0 41	646 செ.வரதன் (1), செ.ர.ரதி (2), செ.மாரிக்க பத்த (3).
	5	-5	ஏ	மி	...	7-4	5	2 62	0 38·5	1 01	460 ப.ஜெயந்தி.
	6	-6	ஏ	மி	...	7-4	5	2 62	0 41·5	1 09	69 ஜ.சிங்கம்.
	7	-7	ஏ	மி	...	7-4	5	2 62	0 29·5	0 79	..... அனாதினம்.
	8	-8	ஏ	மி	...	7-4	5	2 62	0 37·0	0 96	179 சின்னையன். சந்தர்.வ.
	9	-9	ஏ	மி	...	7-4	5	2 62	0 47·5	1 24	670 செ.ர.தயாளன் மற்றவர்களுக்கு சொந்தமானது.*
	10	-10	ஏ	மி	...	7-4	5	2 62	0 34·5	0 90	460 ப.ஜெயந்தி.

* Subject to encumbrances if any.

Village Administrative Officer
11. Kavadipet
12. Ongapur
Ambur Taluk, Vellore District

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ANNEXURE-7

VELLORE
DISTRICT
TAMIL NADU

DISTRICT SURVEY REPORT



DEPARTMENT OF GEOLOGY AND MINING
GOVT. OF TAMIL NADU

Prepared in collaboration with

GEOLOGICAL SURVEY OF INDIA
STATE UNIT: TAMIL NADU AND PUDUCHERRY
MINISTRY OF MINES
GOVT. OF INDIA

As per notification No. S.O. 141 (E) New Delhi, The 15th January, 2016 of Ministry of Environment, Forest and Climate Change, Govt. of India.

DISTRICT SURVEY REPORT

VELLORE DISTRICT, TAMIL NADU

(As per notification No. S.O. 141 (E) New Delhi,The 15th January, 2016 of MoEF&CC, Govt. of India.)

by

DEPARTMENT OF GEOLOGY AND MINING
GOVT. OF TAMIL NADU

Prepared in collaboration with

GEOLOGICAL SURVEY OF INDIA
STATE UNIT: TAMIL NADU AND PUDUCHERRY
MINISTRY OF MINES
GOVT. OF INDIA

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DISTRICT MINERAL SURVEY REPORT
VELLORE DISTRICT, TAMIL NADU

I. INTRODUCTION

In pursuance of the Ministry of Environment, Forest and Climate Change, Government of India *Gazette Notification No.S.O.141(E) dated 15.01.2016 and S.O.190(E) dated 20.01.2016* the District Level Environment Impact Assessment Authority (DEIAA) and District Environment Appraisal Committee (DEAC) were constituted for the grant of Environmental Clearance for category "B2" projects for quarrying of Minor Minerals. Under the para 7 (iii) of the said notification ***"Preparation of District Survey Report for Sand Mining or River Bed Mining and Mining of other Minor Minerals"*** is mentioned along with the procedures for preparation of the report in Appendix-X of the said notification. In view of this, the Commissionerate of Geology and Mines (CGM), Govt. of Tamil Nadu vide D.O. letter no.1392/CO2/2017 dtd. 30.03.2017 has requested the Geological Survey of India (GSI) to spare the officers of GSI to carry out a survey and submit the District Survey Report (DSR) to CGM. Subsequently, competent authority of GSI has accorded permission to spare the officers of GSI, Chennai for survey and preparation of the DSR vide letter no. 1305/SUTNP/TC/DGM/2017 dtd. 5.5.17. for various Districts of Tamil Nadu. In furtherance, Shri.K.Aravind, Superintending Geologist, GSI, Chennai has been deputed in the said work for the Vellore District and carried out rapid assessment during the survey and the District Survey Report has been prepared and submitted to the CGM, Chennai.

In continuation, the District Level Expert Appraisal Committee (DEAC) will scrutinize and screen the scope of category "B2" projects pertaining to mining of minor mineral of lease area less than or equal to five hectare shall require prior environmental clearance from District Level Environment Impact Assessment Authority (DEIAA) and in turn DEIAA would grant Environmental Clearance based on the recommendations of the DEAC for the Minor Minerals on the basis of District Survey Report.

II. OVERVIEW OF MINING ACTIVITIES IN VELLORE DISTRICT

Vellore District in Tamil Nadu accounts for 79% of country's resources of vermiculite (source: IBM - Indian Minerals year book 2016) with a single operating mine producing 989 tonnes in 2015-16 valued for 2218 million rupees. In addition to Granites (Dimension stones) and River Sand with minor occurrence of other minerals such as Fireclay, Graphite, Limestone, Quartz/Silica sand, Apatite, Barytes, Molybdenum, etc., excluding Atomic and Rare Earth Minerals.

Table 1. Overview of Mining Activities in Vellore District

S.NO.	NAME OF MINERAL	PRODUCTION in tonnes 2010-2011
MAJOR MINERAL		
1.	Vermiculite	1908 tonnes
MINOR MINERAL		
1.	Quartz	250 tonnes
2.	Black Granite	15912 cbm
3.	Color granite	6423 cbm
4.	Rough stone	395222 unit
5.	EARTH & BRICK EARTH	120800 unit

Source: Dept. of Geology and Mines

III. LIST OF MINING LEASES IN DISTRICT WITH LOCATION, AREA AND PERIOD OF VALIDITY

Table 2. ABSTRACT – LIST OF MINING LEASES IN VELLORE DISTRICT

		MAJOR MINERALS	MINOR MINERAL							
Sl No.	Taluk	Vermiculite	Quartz	Black Granite		Colour Granite		Rough stone		Total
			Patta Land	Govt., land	Patta Land	Govt. Land	Patta Land	Govt. Land	Patta Land	
1	Vellore	-	-	-	-	-	-	15	09	24
2	Anaicut	-	-	-	-	-	-	01	01	02
3	Katpadi	-	-	01	-	-	-	05	_	06
4	Gudiyatham	-	-	-	-	01	-	04	03	08
5	Arcot	-	-	-	-	-	-	12	01	13
6	Walajah	-	-	06	-	-	-	26	-	32
7	Arakkonam	-	-	-	-	-	-	04	02	06
8	Vaniyambadi	-	01	-	02	-	-	03	01	07
9	Natrampalli	-	-	-	-	-	-	05	-	05
10	Ambur	-	-	-	-	-	-	08	-	08
11	Tirupathur	01	-	-	-	-	03	03	-	07
	Total	**01**	**01**	**07**	**02**	**01**	**03**	**86**	**17**	**118**

Table 3. ABSTRACT - AREA OF MINING LEASES IN VELLORE DISTRICT

Sl No	NAME OF THE MINERALS	NO. OF LEASE GRANTED IN				TOTAL	
		GOVET. LAND		PATTA LAND			
		Nos.	Extent in hectare	Nos.	Extent in hectares	Nos.	Extent in hectares
I	LEASES A. **MAJOR MINERALS**						
	1.VERMICULITE	01	23.70.5	NIL	NIL	1	23.70.5
II	B. **MINOR MINERALS**						
	1. QUARTZ	_	_	1	1.39.5	1	1.39.5
	2. BLACK GRANITE	08	353.84.0	02	2.24.0	10	356.08.0
	3. COLOUR GRANITE	01	72.44.0	02	3.76.7	03	76.20.7
	4. STONE	100		23		123	

Table 4. DETAILED MINING LEASE PARTICULARS - Vermiculite

MAJOR MINERALS								
Sl. No	**Name of mineral**	**Name and complete address of lessee**	**Taluk & Village**	**SF Nos. and extent (in hects.)**	**G.O. & Period of lease**	**Lease period**	**Classification of land**	**Remarks**
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
1	Vermiculite	Tvl. TAMIN LTD., "TWAD HOUSE" No.36, Kamarajar Salai, Chepauk, Chennai – 600 005.	Thirupathur Sevathur	120, 126, 127, 131 etc., 23.70.5	G.O.3(D)/No.75 / Ind(MMA-1) 20 years	23.02.2000 to 22.02.2020	Government land	
Total Leases ---- 1								

Table 5. Minor Minerals – Granite – Government Land (under Rule-8C/8A of TNMMCR-1959)

Sl. No	Name of mineral	Name and complete address of lessee	Village and Taluk	SF Nos.and extent (in hects.)	G.O./Proceedings/ Period of lease	Lease period	Classification of land	Remarks
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
1	Black Granite	Tvl.TAMIN LTD., "TWAD HOUSE" No.36, Kamarajar Salai, Chepauk, Chennai – 600 005.	Mahiman -dalam Katpadi	917& 921 56.54.5 110.37.5 166.92.0	G.O. MS (3D) No. 45/Ind / (MME1) Dep. / dated 20.11.02 20 Years	23.11.2002 to 22.11.2022	Government land	
2	Black Granite	Tvl.TAMIN LTD., "TWAD HOUSE" No.36, Kamarajar Salai, Chepauk, Chennai – 600 005.	Kodaikkal Walajah	1193/6 &1193/7 12.31.5	Go.3(D) No.70/Ind/ (MME1)/Dept dt.20.8.07 20 Years	17.9.2007 to 16.9.2027	Government land	
3	Black Granite	Tvl.TAMIN LTD., "TWAD HOUSE" No.36, Kamarajar Salai, Chepauk, Chennai – 600 005.	Rendadi Walajah	466 75.05.0	Go.3(D) No.71/Ind/ (MME1)/Dept dt.20.8.2007 20 Years	17.9.2007 to 16.9.2027	Government land	
4	Black Granite	Tvl. Gem Granites 78, Cathedral Road, Chennai-86	Kodakkal Wallajha	1193/8 6.35.5	G.O. 3(D) No.75 Ind/(MMB-1) / Dept dated 17.06.1998 20 Years	09.11.98 to 08.11.2018	Government Land	
5	Black Granite	Tvl.Gem Granites 78, Cathedral Road, Chennai – 86	Kodakkal Wallajha	11913/9 6.17.0	G.O. 3(D) No. 41 Ind/ (MMB-1) Dept 20.04.1998 20 Years	09.11.1998 to 08.11.2018	Government land	

6	Black Granite	Tvl. TAMIN LTD., "TWAD HOUSE" No.36, Kamarajar Salai, Chepauk, Chennai – 600 005.	Kodakal Walajah	1193/1 24.30.0	Go.3(D) No.1055/Ind/ (MME1)/Dept dt.3.12.08	3.12.2008 to 2.02.2038	Government land	
7	Black Granite	Tvl. TAMIN LTD., "TWAD HOUSE" No.36, Kamarajar Salai, Chepauk, Chennai – 600 005.	Kodakal Walajah	1230 & 1231 62.73.0	Go.3(D) No.130/Ind/ (MME1)/Dept dt.22.12.08	3.12.2008 to 2.02.2038	Government land	
8	Colour Granite	Tvl. TAMIN LTD., "TWAD HOUSE" No.36, Kamarajar Salai, Chepauk, Chennai – 600 005.	Rajakkal Gudiyattam	311/1 72.44.0	Go.3(D) No.75/Ind/ (MME1)/Dept dt.3.9.07	17.9.2007 to 16.9.2027	Government land	
		Total : 08						

Table 6. Minor Minerals – Granite – Patta Land (under Rule-19A of TNMMCR1959)

Sl. No	Name of mineral	Name and complete address of lessee	Village and Taluk	SF Nos. and extent (in hects.)	G.O./Proceedings/ Period of lease	Lease period	Classification of land and Rules of grant	Remarks
1	Colour Granite	G.Achutan, Athanavoor Village Yelagiri Hills, Tirupathur Taluk	Athanavoor Thirupathur	454/1A 451/2 451/3 0.85.8 0.81.3 0.52.6 2.19.7	G.O.3(D) No.25 Ind/(MMB-1)/ Dept / dated 15.04.2005 20 Years	31.5.2005 to 30.5.2025	Patta land & Rule 19-A	
2	Black Granite	Thiru P.Raymond Ruban 55, Station road Radha Nagar Chrompet Chennai	Vinnamangalam Vaniyambadi	516/2a3, 2a4, 2a5, 2a6 1.10.0	G.O.3(D) No.51 Ind/(MMB-1)/ Dept/ dated 23.07.2008 20 Years	23.07.2008 to 22.07.2028	Patta land & Rule 19-A	
3	Black Granite	Thiru W.Emmanual 21/108, Double road 3rd cross, Sathivachari Vellore 9	Kothakottai Vaniyambadi	73/2a 1.14.0	G.O.3(D) No.01 Ind/(MMB-1)/ Dept/ dated 5.01.2009 20 Years	16.02.2009 to 15.02.2029	Patta land & Rule 19-A	
4	Colour Granite	Thiru.N.Subash S/o.M.A.Natarajan No.32/11, Kasichetty street, Ambur, Vaniyambadi Taluk, Vellore District.	Athanavoor Thirupathur	454/3 454/2B 1.18.6 0.38.4 1.57.0	G.O.3(D) No.11 / Ind / (MMB-11) / Dept / dated 06.04.2015 20 Years	23.5.2015 to 22.5.2035	Patta land & Rule 19-A	
	Total : 4							

Table 7. Minor Mineral - Quartz

Sl. No	Name of mineral	Name and complete address of lessee	Village and Taluk	SF Nos.and extent (in hects.)	G.O./Proceedings/ Period of lease	Lease period	Classification of land	Remarks
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
1	Quartz	Thiru.R.Saravanan S/o.M.Raja No.9/11-Subbaraya Gounder st, Peumapet, Vaniyambadi Town Vellore District.	Vaniyambadi Marimani-kuppam	294/1A1 1.39.5	Proceeding Rc.No.829/MM6/06 dt 20.10.06 20 years	02.02.2008 to 01.02.2028	Patta land	Non Operation
	Total --→ 01							

Table 8. Minor Minerals – Stone - Government Land

Taluk : Vellore

Sl. No	File No.	Name and Address of the Lessee	Village	SF.No.	Extent	Lease Period	Lease Amount in Rs.	Remarks
1.	21/2009	Tmt.D.Parimala W/o.Devendran No.6, Pillaiyar koil st Rangapuram Vellore Taluk.	Perumugai	121/4 (part.25)	1.00.0	08.01.2010 to 07.01.2020	7,60,000/-	
2.	17/2009	Chandrasekaran s/o.Krishnasamy, 1/B Patel street, Sivagiri, Eroad District.	Perumugai	121/4 (part.21)	1.00.0	20.09.2010 to 19.9.2020	7,50,000/-	
3.	18/2009	Thiru.K.Prabu S/o.H.Kannan, No.714-Sakthi Vinnayakar koil street, M.G.R. Nagar, Chennai-78.	Perumugai	121/4 (Part.22)	1.00.0	20.09.2010 to 19.09.2020	6,50,000/-	
4.	19/2009	Thiru.K.Prabu S/o.H.Kannan, No.714-Sakthi Vinnayakar koil street, M.G.R. Nagar, Chennai-78.	Perumugai	121/4 (Part.24)	1.00.0	20.09.2010 to 19.09.2020	7,25,000/-	
5.	20/2009	Thiru.K.Diwakar S/o.Krishnan No.12, Sakthi Vinnayakar koil street, M.G.R. Nagar, Chennai.	Perumugai	121/4 (part.25)	1.00.0	20.09.2010 to 19.09.2020	6,00,000/-	

6.	17/2011	Thiru.G.Arumugam S/o.Gopal, 15, Arcot Road, Rangapuram, Vellore.	Perumugai	121/4 (part.27)	1.00.0	08.01.2012 to 07.01.2022	13,00,000/-	
7.	847/2011	Thiru.T.Sivakumar S/o.Thirunavukarasu 53, Chinnamasuti St, Rashimenpettai, Kattukanallur, Arni T.k. Thiruvannamalai Dt.	Palathuvannan	180 (part.2)	0.80.0	04.3.2012 to 03.3.2022	40,05,000/-	
8.	13/2011	Thiru.Radhakrishnan S/o.Perumal, 1, Pillaiyar koil street, Rangapuram, Vellore.	Perumugai	121/4 (part.8)	0.80.0	20.3.2012 to 19.3.2017	6,75,000/-	
9.	12/2011	Thiru.Ragunathan S/o.Manikam 32, Easwaran Nagar, Keel Kattalai, Chennai.	Perumugai	121/4 (part.4)	0.80.0	26.8.2012 to 25.08.2017	6,50,000/-	
10	846/2011	Thiru.V.Ravi S/o.Vethapuri No.1, Eazhilnagar, Main Road, 7th cross Rajiv Gandhi Nagar, Allapuram, Vellore.	Palathuvannan	180 (part.1)	0.80.0	13.3.2012 to 12.3.2022	37,10,000/-	
11	774/2015	Thiru.E.Elampoopathi S/o.Elumalai 1/125, Melpatti Street, Karigiri Village, Katpadi Taluk.	Palamathi	412/11 (Part.1)	0.80.0	02.3.2016 to 01.3.2021	8,62,000/-	

12	275/2015	Tmt.Bobby W/o.Kathiravan Old No.1/75, New No. 134, Thiruvallurvar st Virupatchipuram, Vellore T.K.	Palamathi	412/11 (part.3)	0.80.0	03.11.2016 to 02.11.2021	19,30,950/-	
13	278/2015	Thiru.S.Nandhakumar S/o.Swaminathan No.5, Balaji Road, Krishna Nagar, Vellore.	Palamathi	300 (part.2)	0.95.0	22.02.2017 to 21.02.2022	7,56,950/-	
14	762/2015	Thiru.S.Nandakumar S/o.Swaminathan No.5, Balaji Road, Krishnanagar, Vellore.	Munjurpattu	631/2B (Part.1)	2.00.0	22.02.2017 to 21.02.2027	37,46,799/-	
15	763/2015	Thiru.S.R.Pandurangam S/o.Ramanadhan No.58A, Bajanai koil st, Thuthipattu, Vellore.	Munjurpattu	631/2B (part.1)	2.00.0	22.02.2017 to 21.02.2027	40,50,000/-	
	Total ----- 15							

Table 9. Minor Minerals – Stone - Patta Land

Taluk : Vellore

Sl. No	File No.	Name and Address of the Lessee	Village	SF.No.	Extent	Lease Period	Remarks
1.	275/2013	P.Prabakaran Pichandi No.675/A, TNHB, Phase-II Sathuvachari, Vellore.	Sirukalambur	99/3A, 100/2	0.78.0	05.9.2013 to 04.9.2018	
2.	107/2013	Thiru.M.N.Udayadiwaagar S/o.Rajan, Old No.1/59A, New No.161A, Perumal Koil street, Virupatchipuram Vill, Vellore Taluk & District.	Ariyur	302/1 302/2, 302/3 302/4 and 305/5	0.57.5	15.6.2015 to 14.6.2020	
3.	761/2013	Thiru.S.Hari S/o.Subramani, Old No.4/1 New No.7 Nedunsalai, Vadivelnagar, Sankaranpalayam, Vellore Taluk & District.	Sirukalambur	12/1, 12/2, 12/3 12/4, 19/3A, 19/3B & 19/3C	0.67.0	16.6.2015 to 15.6.2020	
4.	02/2014	Thiru.M.Sundarraji S/o.A.Murugesan No.170, Duraisamy Mudali St, Palavansathu Village, Vellore Taluk & District.	Ariyur	309/1A, 309/1B, 309/1C, 309/1D, 309/1E, 309/1F	1.06.0	24.11.2015 to 23.11.2020	

5.	759/2013	Thiru.G.Prabhakaran S/o.R.Ganesan (Late), No.34, Thanjan Street, Pennathur Village, Vellore Taluk & District.	Sathupalayam	5/3	1.40.0	24.11.2015 to 23.11.2020	
6.	325/2014	Thiru.P.Boopalan S/o.Palani, No.22/14, Murugan koil st, Chitteri Village, Vellore Taluk & District.	Ariyur	295/1B1, 295/1B2, 295/2C1 & 295/2C2	0.86.0	30.11.2015 to 29.11.2021	
7.	357/2014	Thiru.P.Boopalan S/o.Palani, No.22/14, Murugan koil street, Chitteri Village, Vellore Taluk & District	Ariyur	301/1A, 301/1B & 301/1C	0.67.5	30.11.2015 to 29.11.2020	
8.	409/2014	Thiru.K.Ramesh S/o.Kothandan, Old No.3/20A, New No.39, Bajanai koil street, Mettuediyampatti Village, Adukamparai Post, Vellore Taluk and District.	Palamathi	499/3	1.07.5	30.6.2016 to 29.6.2021	
9.	253/2009	Tmt.Tamilarasi W/o.Sabapathi, No.1, Narayanasamy St, Pennathur Village, Vellore T.K.	Ariyur	323/4 & 326A/4C	1.38.5	16.11.2016 to 15.11.2021	
	Total------ 9						

Table 10. Minor Minerals – Stone - Government Land

Taluk : Anaicut

Sl. No	File No.	Name and Address of the Lessee	Village	SF.No.	Extent	Lease Period	Lease Amount in Rs.	Remarks
1	425/2011	Thiru.R.Natarajan S/o.Rangaswamy 147, Kollamangalam Vill Ambur Taluk, Vellore	Anaicut	254/4	0.34.0	10.5.2017 to 09.5.2022	1,75,000/-	
	Total------ 01							

Table 11. Minor Minerals – Stone - Patta Land

Taluk : Anaicut

Sl. No	File No.	Name and Address of the Lessee	Village	SF.No.	Extent	Lease Period	Remarks
1.	425/2011	D.Sivakumar S/o.Damodaran No.143, Paraimettu st, Palavansathukuppam, Vellore Taluk, Vellore District.	Karadikudi	258/1, 258/4, 258/5, 258/6 & 258/7	1.24.5	20.10.2014 to 19.10.2019	
	Total------ 01						

Table 12. Existing Stone Quarries in Government Lands

Taluk : Katpadi

Sl. No	File No.	Name and Address of the Lessee	Village	SF.No.	Extent	Lease Period	Lease Amount in Rs.	Remarks
1.	8/2008	P.Anandaraj S/o.(late) Parasuraman No.3/111, Pudu street, Melmonavoor, Vellore-10.	Angarankuppam	240/1	0.32.5	10.7.2008 to 09.7.2018	2,10,000/-	
2.	22/2009	L.B.Babu S/o.Bodinaidu Lateri Village, Katpadi Taluk.	Thondanthulasi	243	0.80.0	19.11.2009 to 18.11.2019	17,60,000/-	
3.	73/2010	D.Rajendran S/o.Duraisamy No.109, South Vanniyar st Sholingar.	Ponnai	705 (part.1)	1.00.0	16.8.2011 to 15.8.2021	2,15,000/-	
4.	06/2011	D.Kumar S/o.R.Durairaj No.4/41, Pilliyar koil st, Kammavar pudhur, Katpadi Taluk.	Karigiri	336/3	0.39.5	31.10.2011 to 30.10.2021	34,75,000/-	
5.	51/2016	M.Govindaraj S/o.Munusamy, No.2/8, Ponniyamman Koil Street, Karigiri Village, Katpadi Taluk, Vellore District.	Karigiri	336/1A2 & 336/10	0.26.0	16.11.2016 to 15.22.2021	Rs.6,25,000/-	
Total------- 05								

Table 13. Existing Stone Quarries in Government Lands

Taluk : Gudiyatham

Sl. No	File No.	Name and Address of the Lessee	Village	SF.No.	Extent	Lease Period	Lease Amount in Rs.	Remarks
1.	14/2008	S.Dhanasekaran S/o.Srinivasan 47, Pillaiyar Koil street, Seevoor Village, Kallur post, Gudiyatham Taluk	Thattaparai	275 (part.6)	0.80.0	07.3.2008 to 06.3.2018	3,50,000/-	
2.	12/2008	P.Govindasamy S/o.Periyannan No.5, Nadupettai, Gandhi Road, Gudiyatham T.k.	Thattaparai	275 (part.4)	0.80.0	10.3.2008 to 09.3.2018	3,60,000/-	
3.	18/2008	C.Loganathan S/o.Chandran 4/27, Chittykuppam post, Sundarakuttai village, Gudiyatham Taluk.	Pogalur	229(Part.3)	1.00.0	19.3.2008 to 18.3.2018	10,65,000/-	
4.	48/2009	S.Manokaran S/o.Sundaresan Poonkulam Village, Agravaram post, Gudiyatham Taluk.	Agravaram	261 (Part.1)	1.00.0	04.8.2009 to 03.8.2019	3,55,000/-	
	Total------→ 04							

Table 14. Existing Stone Quarries in Patta Lands

Taluk : Gudiyatham

Sl. No	File No.	Name and Address of the Lessee	Village	SF.No.	Extent	Lease Period	Remarks
1.	362/2012	Tmt.G.Amutha W/o.Gajendran Karkoor Village, Melpatti post, Gudiyatham T.k	Paravakkal	197/10A	0.82.0	03.12.2013 to 02.12.2018	
2.	34/2015	Thiru.G.Nagesh S/o.Gopal, Thonaparai Village, Rajakuppam post, Gudiyatham Taluk, Vellore District.	Pogalur	267/5	0.55.5	02.3.2016 to 01.3.2021	
3.	32/2013	Thiru.G.Saravanan S/o.N.Govindasamy , No.1/46E, Kollaimedu part, Sethuvandai Village, Katpadi Taluk, Vellore Dt.	Nagal	332/2	0.17.5	09.09.2016 to 08.09.2021	
	Total -----→ 03						

Table 15. Existing Stone Quarries in Government Lands

Taluk : Arcot

Sl. No	File No.	Name and Address of the Lessee	Village	SF.No.	Extent	Lease Period	Lease Amount in Rs.	Remarks
1.	20/2008	A.Imran Ul-Haq S/o.Anwarbasha, No.147, Anna salai, Arcot Taluk.	Anaimallur	374/5 part.3	2.00.0	27.2.2008 to 26.2.2018	5,50,000/-	
2.	21/2008	V.Vinothkumar S/o.P.Vasudevan 6-M.F.Road, Ranipet, Vellore.	Anaimallur	374/5 (part.4)	1.00.0	01.4.2008 to 31.3.2018	3,50,000/-	
3.	19/2008	M.Sathishkumar S/o.N.P.Moorthy 6-M.F.Road, Ranipet, Vellore.	Anaimallur	374/5 (part.2)	0.80.0	04.11.2008 to 03.11.2018	2,60,000/-	
4.	25/2009	A.Noorul haq S/o.Anwarbasha No.32, Bharathyar st, Arcot Taluk.	Anaimallur	374/5 (part.6)	1.00.0	20.7.2009 to *19.7.2019*	5,25,000/-	
5.	26/2009	M.A.Sangeethkumar S/o.Manikam 32, Eswaran Nagar, Kilkattalai, Chennai-117.	Nambarai	433 (part.1)	0.80.0	04.8.2009 to 03.8.2019	5,30,000/-	
6.	27/2009	R.Adikesavelu S/o.Ramachandiran Thennadiyalam Vill, Rathinagiri post, Walajah Taluk.	Nambarai	433 (part.2)	1.00	10.8.2009 to 09.8.2019	5,25,000/-	

7.	24/2009	S.Kanniyappan S/o.V.Shanmugam, New Street, Pudhupalayam Govindareddypalayam pt. Ussoor (via) Anaicut Taluk 632105	Anaimallur	374/5 (part.5)	1.00.0	11.3.2010 to 10.3.2020	7,15,000/-	
8.	28/2009	G.K.Sudhakaran S/o.Kesavan 14, Parthasarathi st, Ayyavu naidukalani, Aminjakarai, Chennai	Nambarai	433 (part.3)	0.80.0	24.5.2010 to 23.5.2020	5,20,000/-	
9.	88/2010	G.S.Venkatesh S/o.Subramani, 33A, 4th cross street, Arcot Taluk.	Anaimallur	374/5 (part.7)	1.00.0	20.9.2010 to 19.9.2020	14,40,000/-	
10.	89/2010	T.Prasanna W/o.Thiruvenkadam 37/1,Mariyamman koil st, Pallavaram, Chennai-43.	Durgam	364 (part.1)	1.00.0	10.01.2011 to 09.01.2021	3,70,000/-	
11.	24/2011	K.T.Umapathy S/o.Thangavel, Kaanudiyampalayam, Kalamangalam (via) Eroad District.	Anaimallur	374/5 (part.8)	0.80.0	13.12.2011 to 12.12.2021	18,50,000/-	
12.	25/2011	Vasim A.Adhanan S/o.Anvar Basha, No.34, Bazzar street, Ranipet.	Kuppam	280/1	1.00.0	02.01.2012 to 01.01.2022	20,75,000/-	

Table 16. Existing Stone Quarries in Patta Land

Taluk : Arcot

Sl. No	File No.	Name and Address of the Lessee	Village	SF.No.	Extent	Lease Period	Remarks
1.	641/2015	Thiru. P. Elumalai, S/o. Periyasamy, No.6/38, Vaniyangulam Village Virupatchipuram Post, Vellore Taluk & District.	Venkatapuram Village	332/2 333/2 & 335/3	1.65.0	23.09.2016 to 22.09.2021.	

Table 17. Existing Stone Quarries in Government Lands

Taluk : WALAJAH

Sl. No	File No.	Name and Address of the Lessee	Village	SF.No.	Extent	Lease Period	Lease Amount in Rs.	Remarks
1	31/2008	K.Chittybabu S/o.Krishnamanaidu, No.4/17 Krishnapuram vill Chenji post, (via)Lateri, Katpadi Taluk	Anandalai	1/4 (Part.13)	0.80.0	24.03.2008 to 23.03.2018	5,00,000/-	
2.	28/2008	S.M.Sugumar S/o.Muruganandam Vanapadi road, Ranipet, Walajah T.K.	Anandalai	1/4 (part.10)	0.80.0	25.03.2008 to 24.03.2018	4,00,000/-	
3	27/2008	N.P.Moorthy M/s.K.P.Blue Metals 27/A, M.B.D. Road, Ranipet, Walajah T.K.	Ayilam	662	2.00.0	30.3.2008 to 29.3.2018	2,10,000/-	
4	30/2008	K.Senthilkumar S/o.Kalaiyarasan No.90, Kamarajar Road, Ankaputhur, Chennai-70.	Anandalai	1/4 (part.12)	0.80.0	03.6.2008 to 02.6.2018	12,00,000/-	
5	29/2008	P.Palanivelu S/o.Periyagoundar Paravakadu Ponnarampatti post, Vazhapadi taluk, Selam District.	Anandalai	1/4 (part.11)	0.80.0	08.6.2008 to 07.6.2018	10,00,000/-	

6	33/2008	J.Chandrakumar S/o.P.M.Jayapal, Poondi Village, Walajah Taluk.	Anandalai	1/4 (part.15)	0.80.0	05.7.2008 to 04.7.2018	4,10,000/-	
7	32/2008	E.N.Sudarsanam S/o.Narasimmalu naidu No.22/9 Thirumoorthy st, Ramnagar, Ambathur, Chennai-600 053.	Anandalai	1/4 (part.14)	0.80.0	08.9.2008 to 07.9.2018	4,25,000/-	
8	45/2009	S.M.Sugumar S/o.Muruganatham Vanapadi road, Ranipet, Walajah T.k	Anandalai	1/4 (part.28)	1.62.0	04.8.2009 to 03.8.2019	8,30,000/-	
9	48/2009	S.K.Sabapathi No.1703, phase-II, Sathuvachari, Vellore-9.	Senkadu	165 (part.2)	1.00.0	04.8.2009 to 03.8.2019	7,50,000/-	
10.	41/2009	J.Umapathi S/o.Jayaraman 44, Ramanuja kundam st, Poonamalli, Chennai.	Anandalai	1/4 (part.24)	2.00.0	08.01.2010 to 07.01.2020	10,75,000/-	
11	37/2009	H.Ramesh S/o.Hariramulu No.5, 5th block, 18th st, Anna Nagar west, Chennai-40.	Anandalai	1/4 (part.20)	1.00.0	19.11.2009 to 18.11.2019	6,00,000/-	
12	38/2009	H.Babu S/o. S/o.Hariramulu No.5, 5th block, 18th st, Anna Nagar west, Chennai-40.	Anandalai	1/4 (part.21)	1.00.0	19.11.2009 to 18.11.2019	6,10,000/-	

13	39/2009	P.Ravikumar S/o.Prakasam No.1, Kalyanamandabam Jothi Nagar, Arakonam T.k.	Anandalai	1/4 (part.22)	1.00.0	19.11.2009 to 18.11.2019	6,15,000/-	
14	40/2009	G.R.Thirumalai S/o.A.G.Ramamurthy No.4, 1st cross street, Karaiyansavadi, Poonamalli, Chennai-56.	Anandalai	1/4 (part.23)	1.00.0	08.01.2010 to 07.01.2020	6,05,000/-	
15	44/2009	S.Dhanakotti S/o.Subramani No.82, Bharathi Nagar, Main Road, Jameenpallavaram Chennai.	Anandalai	1/4 (part.27)	1.00.0	08.01.2010 to 07.01.2020	6,10,000/-	
16	33/2009	R.Saraswathi W/o.R.Rajendran No.3-4th cross street, TNHB, Walajah T.K.	Anandalai	1/4 (part.16)	1.00.0	08.01.2010 to 07.01.2020	6,05,000/-	
17	46/2009	R.Saraswathi W/o.R.Rajendran No.3-4th cross street, TNHB, Walajah T.K.	Anandalai	1/4 (part.29)	1.00.0	08.01.2010 to 07.01.2020	6,05,000/-	
18	42/2009	M.Sekar S/o.Munisamy 1/207 Periyar Nagar, Thirisoolam,Chennai-43.	Anandalai	1/4 (part.25)	1.00.0	31.5.2010 to 30.5.2020	6,20,000/-	
19	43/2009	T.Premkumar S/o.Thiyagarajan 109, Sri, Rangammal st, Old Vnnarapettai, Chennai-21.	Anandalai	1/4 (part.26)	1.00.0	31.5.2010 to 30.5.2020	6,10,000/-	

20	36/2009	S.K.Ramyageethanjali D/o.S.K.Sababathi No.1703 Phase-II Sathuvachari, Vellore	Anandalai	1/4 (part.19)	1.00.0	12.7.2010 to 11.7.2020	6,10,000/-	
21	35/2009	S.Bala Adhithiya Sabha S/o.S.K.Sabapathi No.1703 Phase-II Sathuvachari Vellore Taluk.	Anandalai	1/4 (part.18)	1.00.0	12.7.2010 to 11.7.2020	6,10,000/-	
22	34/2009	S.K.Ramya geethanjali D/o.S.K.Sababathi No.1703, Phase-II Sathuvachari, Vellore.	Anandalai	1/4 (part.17)	1.00.0	12.7.2010 to 11.7.2020	6,10,000/-	
23	30/2009	M/s.K.P.Blue Metal N.P.Moorthy 27/A, M.B.D.Road, Ranipettai, Walajah T.K.	Ayelam	662 (part.2)	2.00.0	19.7.2010 to 18.7.2020	5,75,000/-	
24	30/2011	N.K.Ragu S/o.Kuppan 3/266, New street, Melvallam, Walajah T.K.	Kodakkal	1193/1 (part.5)	2.00.0	29.8.2011 to 28.8.2021	15,00,000/-	
25	33/2011	S.Gopinath S/o.Sugumar, No.5, 4th Cross street, Anna avenue Ranipet, Walajah T.k.	Musiri	1/1	0.78.0	16.11.2011 to 15.11.2021	6,25,000/-	
26	775/2016	Thiru.J.Baskar S/o.Jayaraman, No.2/499, Pillaiyar koil street, Narayanapuram, Puttuthakku, Walajah Taluk, Vellore District	Arapakkam	477 (part.1)	1.00.0	20.10.2016 to 19.10.2021	5,10,000/-	
	Total ----→ 26							

Table 18. Existing Stone Quarries in Government Lands

TALUK : ARAKONAM

Sl. No	File No.	Name and Address of the Lessee	Village	SF.No.	Extent	Lease Period	Lease Amount in Rs.	Remarks
1	52/2009	C.Sivaraman S/o.Chinnappa reddy, Kuppukalmedu, Banavaram post, Arakonam Taluk.	Karnavoor	270 (part.2)	2.00.0	11.3.2010 to 10.3.2020	8,00,000/-	
2	37/2011	M.Mani S/o.Muniyandi Kuppukalmedu Village, Banavaram post, Arakonam Taluk.	Velithangipuram	450 (part.2)	0.80.0	15.12.2011 to 14.12.2021	12,00,000/-	
3	36/2011	K.Gopal S/o.Kannappareddy, Kuppukkalmedu Banavaram post, Arakonam Taluk.	Karnavoor	270 (part.3)	2.00.0	05.8.2012 to 04.8.2022	12,75,000/-	
4	277/2015	Thiru.J.Sureshkumar S/o.Jayaramnaidu, No.2/70,Karthigeyapuram, Pathmapuram Village, Thiruthani Taluk, Thiruvallur District	Kizhavanam	170	0.80.0	23.09.2016 to 22.09.2021	14,00,000/-	
	Total ---→ 04							

Table 19. Existing Stone Quarries - Patta Lands

Taluk : Arakonam

Sl. No	File No.	Name and Address of the Lessee	Village	SF.No.	Extent	Lease Period	Remarks
1	777/2013	Thiru.R.B.Raja S/o.Balaram No.2/261, Pillaiyar Koil St, Seyyoor Village, Arakkonam Taluk, Vellore District.	Athur	351/4 351/5	0.97.5	23.5.2015 to 22.5.2020	
			Thakolam	95 108/3 108/10	1.72.0		
2	286/2013	Thiru.R.Athimulam S/o.Rama Reddy, No.21A, Big street, Poolipakkam Village & Post, Arakkonam Taluk, Vellore District	Polipakkam	248/1C, 248/3, 248/4, 248/5 & 251/2A	1.12.0	11.01.2016 to 10.01.2021	
Total ----- 02							

Table 20. Existing Stone Quarries in Government Lands

TALUK : VANIYAMBADI

Sl. No	File No.	Name and Address of the Lessee	Village	SF.No.	Extent	Lease Period	Lease Amount in Rs.	Remarks
1	57/2009	K.A.Gunasekaran S/o.K.R.Annamalai 519, Anjaneyar koil st, Fort, Vaniyambadi Taluk.	Kothakottai	1/1 (part.2)	0.80.0	08.01.2010 to 07.01.2020	4,75,000/-	
2	105/2010	R.Thirugnanam S/o.Ramalingam 430, Koothandawar Nagar, Gurisilapatti Village, Vaniyambadi Taluk	Nimmiyampattu	638/2	1.00	10.01.2011 to 09.01.2021	3,50,000/-	
3	50/2011	A.Arunagiri S/o.A.Annadurai Madapalli Village, Madavalam post, Thirupathur Taluk.	Marimanikuppam	433/1	1.00.0	16.8.2011 to 15.8.2021	36,25,000/-	
	Total ------ 03							

Table 21. Existing Stone Quarries in Patta Land

TALUK : VANIYAMBADI

Sl. No	File No.	Name and Address of the Lessee	Village	SF.No.	Extent	Lease Period	Remarks
1	518/2013	Thiru.D.Balakrishnan, S/o.Dhanapal, Nagadevanpatti Village, Kathari post, Natrampalli, Thirupathur Taluk.	Amburpettai	48(Part)	1.04.5	25.3.2015 to 24.3.2020	
	Total ---- 01						

Table 22. Existing Stone Quarries in Government Lands

TALUK : NATRAMPALLI

Sl. No	File No.	Name and Address of the Lessee	Village	SF.No.	Extent	Lease Period	Lease Amount in Rs.	Remarks
1	45/2008	Tmt.Mageswari W/o.Mani Nattanvattam, Agrakaram post, Pudupettai (viz) Thirupathur Taluk.	Agrakaram	638/1	0.80.0	02.02.2008 to 01.02.2018	3,05,000/-	
2	103/2010	K.Anumantharajan S/o.S.Kanthasamy 22/2 M.M.Ramasamy st Natrampalli Village, Thirupathur Taluk.	Gurubavani-gunda	42	1.00.0	20.9.2010 to 19.9.2020	2,60,000/-	

3	46/2011	M.Vetrivel S/o.Murugesan Bharathi Nagar, Agrakaram Village & pt, Pudupettai (viz) Thirupathur Taluk.	Agrakaram	638/1 (part.2)	1.00.0	16.8.2011 to 15.8.2021		
4	47/2011	G.Sampathkumar S/o.Gandhi Bharathi Nagar, Pudhupettai (viz) Thirupathur Taluk.	Agrakaram	638/1 (part.3)	1.00.0	16.8.2011 to 15.8.2021	5,00,000/-	
5	49/2011	K.Jayakumar S/o.Kuppan 13th East medu Kalnarsampatti village, Konnappattu Post, Thirupathur Taluk.	Mallapalli	1/4	1.00.0	29.8.2011 to 28.8.2021	4,75,000/-	
	Total ---- 05							

Table 23. Existing Stone Quarries in Government Lands

TALUK : AMBUR

Sl. No	File No.	Name and Address of the Lessee	Village	SF.No.	Extent	Lease Period	Lease Amount in Rs.	Remarks
1	47/2008	R.Vinothkumar S/o.Rajendran No.66, Kattukollai, Vaniyambadi Taluk.	Vinnamangalam	420 (part.4)	0.80.0	24.6.2008 to 23.6.2018	3,50,000/-	
2	54/2009	G.Srinivasan S/o.Ganapathi No.25A, Katpadi road, Kulathur, Chennai	Malayampattu	73 (part.2)	0.80.0	20.7.2009 to 19.7.2019	3,50,000/-	
3	55/2009	A.B.Iyappan S/o.Balasubramaniyan old No.546, New No.14 Anjaneyar koil street, Thirupathur Taluk.	Vinnamangalam	419 (part.3)	1.00.0	11.3.2010 to 10.3.2020	4,20,000/-	
4	59/2009	K.Thulasingam S/o.Kumarasamy No.22, Rathinam Magal, Bajanai koil st, Melkuttai post, Chennai-48	Bainapalli	75/2 (part.2)	1.00.0	11.3.2010 to 10.3.2020	2,50,000/-	
5	109/2010	R.Mani S/o.Ramulu 671,Munisamy Mudaliyar st, Vaniyambadi Taluk	Vinnamangalam	416 (Part.4)	0.80.0	10.01.2011 to 09.01.2021	5,20,000/-	

6	111/2010	D.Gunalan S/o.Dakshnamoorthy Rangapuram Thuthipattu (via) Ambur Taluk	Vinnamangalam	419 (part.4)	1.00.0	10.01.2011 to 09.01.2021	5,30,000/-	
7	107/2010	R.Kumaresan S/o.Ragupathy Arangaldurgam Village, Ambur Taluk.	Karapattu	132/1A	1.00.0	10.11.2011 to 09.11.2021	5,30,000/-	
8	40/2011	E.Venkatesan S/o.Ettiya Goundar, Devalapuram, Ambur Town and Taluk.	Venkatasamu-thiram	323/1 (Part.1)	1.00.0	16.11.2011 to 15.11.2021	5,05,000/-	
9	?	Karthick S/o Boopathy	Vinnamangalam	419	?	?	?	
	Total --------- 09							

Table 24. Existing Stone Quarries in Government Lands

TALUK : THIRUPATHUR

Sl. No	File No.	Name and Address of the Lessee	Village	SF.No.	Extent	Lease Period	Lease Amount in Rs.	Remarks
1	46/2008	S.Rajendran S/o.Subramani 35C, EL.Ragavanar st, Thirupathur town & Tk.	Kumdikanpatti	77	0.80.0	30.3.2008 to 29.3.2018	4,21,000/-	
2	58/2009	A.Natarajan S/o.Appavu Koratti village & post, Thirupathur Taluk.	Chinnakandili	75/1	1.00.0	04.8.2009 to 03.8.2019	2,50,000/-	
3	48/2011	S.Gunasekaran S/o.Settu Kasinicakanpatti Vill, Thirupathur Taluk.	Udayamuthur	557 (Part.2)	1.00.0	05.8.2012 to 04.8.2022	2,65,000/-	
Total -----→ 03								

Table 25. DETAILS OF EXISTING PWD SAND QUARRIES - VELLORE DISTRICT

Lorry – 2

Sl. No.	Taluk	Village	Survey No. & Extent in Hects.	Name of the river	EIA Clearance order No. & Date	Collector's Proceedings No & Date.	Lease period	Bullock Cart / Lorry & quantity	Operation / Non operation	Remarks
1	Gudiyatham	Pasumathur	958/2 6.00.0	Palar	Lr.No.SEIAA,TN/ F.No.5971/EC/1(a)/ 3928/2017 ehs; 09.05.2017.	Rc.No.418/2016 (Mines) dt.05.06.2017	05.06.2017 to 04.06.2018	Lorry 60,000 cbm	Non operation	_
2	Arcot	Sakaramallur	1588 6.75.0	Palar	Lr.No.SEIAA,TN/ F.No.6160/EC/1(a)/ 3931/2017 ehs; 09.5.2017.	Rc.No.419/2016 (Mines) dt.03.06.2017	03.06.2017 to 02.06.2018	Lorry 1,20,000 cbm	operation	_
	Walajah	Sathampakkam	463/2 5.25.0							

Table 26. FUNCTIONING PWD SAND QUARRIES - VELLORE DISTRICT

PARTICULARS OF RUNNING QUARRIES										
Sl, No.	Name of Quarry	Name of River	S.F. No.	Village	Total Extent (Ha)	Proposed Extent (Ha)	Quamtity to be Lifted in cu.m	Latitude	Longitude	Remarks
1	Sakkaramallur & Sathampakkam	Palar	S.F.No.1588 (P) S.F.No.463 (P)	Sakkaramallur & Sathampakkam	12.00.0	12.00.0	120000	12°52'15.75N 12°52'14.80"N	79°24'16.26"E 7924'06.36"E	
2	Kothamangalam & Poigai	Palar	S.F.No.337 (P) S.F.No.364 (P)	Kothamangalam & Poigai	7.00.0	7.00.0	70,000	12°55'34.31"N 12°55'27.00 N	79°03'018.78"E 79°03'03.96E	

Table 27. Details of Existing Sand Stockyards -- VELLORE DISTRICT

Name and address of the applicant	Details of the area granted (Taluk, Village, S.F.No. & Extent in Ha.)	Details of the District Collector's Proceedings	Period	Remarks
Thiru.Karupaiya S/o.Panniselvam 122, Kulithiranpattu, Karambakudi Taluk, Pudukottai District.	Walajah Taluk, Poondi Village, 356/1B(0.20.5), 356/2B(0.11.0), 356/2C(0.01.0), 363/1B(0.30.0), 364(0.05.0), 365/1(0.13.0), 366/1A (0.17.5), 501/1A (0.09.5), 501/1B (0.09.0) and 501/1C (0.10.0) **(OAE of 1.26.5 Ha.)**	Rc.No.430/2016 (Mines) dt: 19.11.2016.	25.11.2016 to 24.11.2017	Non operation
Thiru.P.Karikalan S/o.Panneerselvam Kulanthiranpattu Village, KarambakkudiTaluk, Pudukottai District.	Walajah Taluk, Sathampakkam 440/1(Part) **(OAE of 1.64.0 Ha.)**	Rc.No.323/2016 (Mines) dt : 03.11.2016	03.11.2016 to 02.11.2017	Non operation
Thiru.S.Gopal S/o.Subbaiya No.51A Kudalur Vil, Kathakurchi post, Alankudi Tk, Pudukottai District.	Anaicut Taluk Kandaneri Village SF.Nos.198/1B (0.23.0), 198/2(0.12.0),198/3(0.13.0), 202(0.67.0), 204/1A(0.10.0) & 204/1B (0.13.5) (**OAE of 1.38.5 Ha.)**	Rc.No.429/2016 (Mines) dt : 05.11.2016	05.11.2016 to 03.11.2017	Non operation

Table 28. Details of Proposed Sand Quarries in VELLORE DISTRICT

Sl, No.	Name of Quarry	Name of River	S.F. No.	Village	Toal Extent (Ha)	Proposed Extent (Ha)	Quantity to be Lifted in cu.m	Latitude	Longitude	Remarks
1	Arumparuthi	Palar	242 (P)	Arumparuthi	20.00.0	20.00.0	2,00,000	12°57'24.96"N 12°57'18.52"N 12°57'13.81"N 12°57'20.25"N	79°12'54.63"E 79°13'55.59"E 79°13'22.76"E 79°12'21.80"E	
2	Nowlock	Palar	3 (P)	Nowlock	7.20.0	7.20.0	72000	12°55'20"N 12°55'21"N 12°55'30"N 12°55'31"N	79°17'41"E 79°17'33"E 79°17'42"E 79°17'34"E	
3	Pattu	Palar	395(P)	Pattu	5.76.0	5.76.0	57600	12°54'35.95"N 12°54'39.48N 12°54'35.58"N 12°54'39.86N	78°54'24.86"E 78°54'08.85 E 78°54'08.95"E 78°54'24.77 E	
4	Pasumathur-2	Palar	958/2(P)	Pasumathur	15.00.0	15.00.0	150000	12°55'36.93"N 12°55'45.03"N 12°55'35.19"N 12°55'43.29"N	78°58'00.04"E 78°57'59.31"E 78°57'40.22"E 78°57'39.49"E	

IV. DETAILS OF REVENUE OR ROYALTY RECEVIED IN LAST THREE YEARS - *Information yet be received*

V. DETAIL OF PRODUCTION OF SAND AND MINOR MINERALS IN LAST THREE YEARS

Table 29. Production of commodities during 2015-16

Sl.No	Name of the Minerals	Production in Tonnes
1.	Quartz	--
	VERMICULITE	1350 tonnes
2	BLACK GRNITE	3185.788 cbm
3	COLOUR GRANITE	2392.8cbm
4	STONE	1232026 unit
5	EARTH & BRICK EARTH	115140 unit
6	SAND	--

(Source: Department of Economics & Statistics, Govt. of Tamil Nadu)

VI. PROCESS OF DEPOSITION OF SEDIMENTS IN RIVERS OF THE DISTRICT

Palar River is the major river draining the district and major part of the district falls in the Palar River Basin. Palar River flows towards east for a distance of about 295 km. It runs parallel to the hill ranges of the Eastern Ghats for a major part of its course and has a vast flood plain in the lower reaches, but is dry for major part of the year and it is ephemeral in nature. Palar River originates in Nandhi Durg, Kolar district in eastern part of Karnataka State at an elevation of 800m above MSL, which passes through the hilly terrain of south western part of Andhra Pradesh and enter into Tamilnadu on the west of Vaniyambadi town and flows through Vellore, Thiruvannamalai and Kancheepuram Districts and finally enter into Bay of Bengal near Sadarangapattinam . Other major tributaries of Palar River in Vellore District is Ponnaiyar, Cheyyar, Pambar and Malattar and almost all the streams are ephemeral in nature and are mostly structurally controlled.

The Palar River Basin having an annual potential of 1758 MCM and average annual flow into the sea to be 12.5 TMC (Source: IAMWARM). Until a century ago it was a perennial river, but now the water flow is confined to the monsoon months, which has attracted the sand miners.

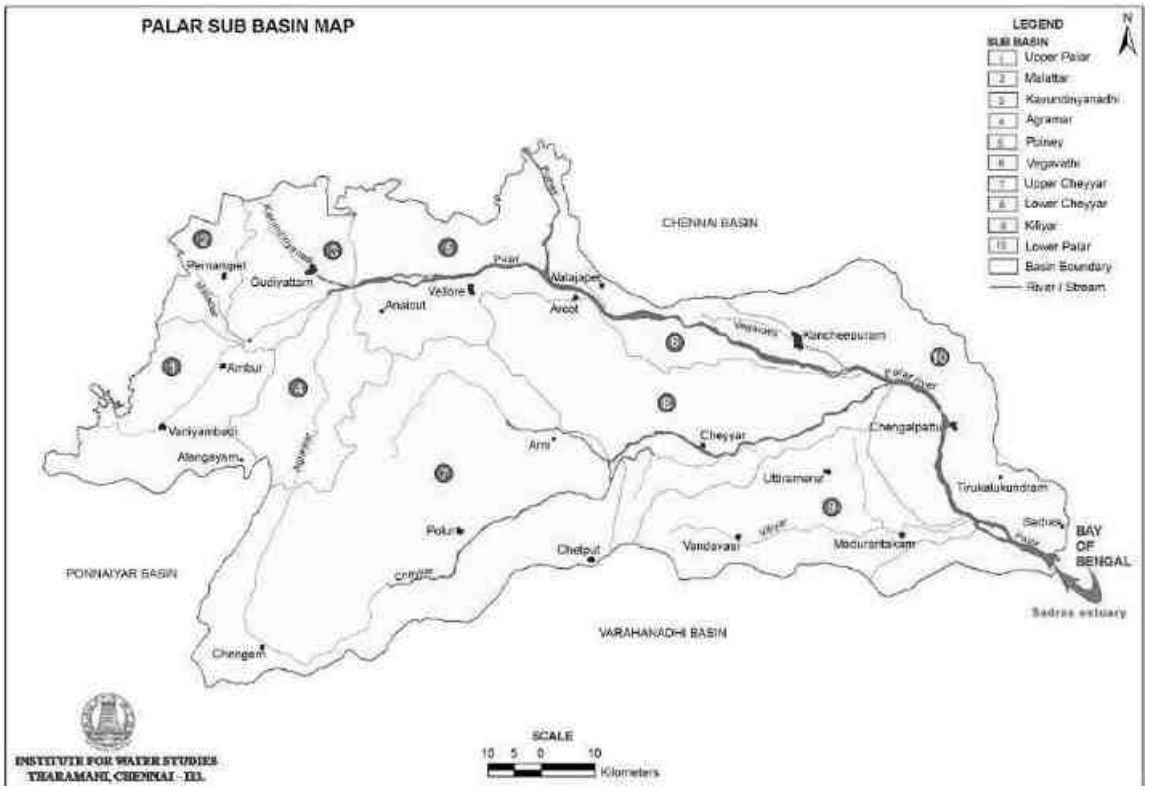


Figure 1. Map of Palar Basin along with 10 sub basins of Palar (Source: IWS)

River channels transport sediments and water from headwaters to its mouth. They are built up and maintained by erosion and deposition of sediments during river flows (Hecde, 1986; Whiting, 1998). Most rivers experience a wide range of flows along its river course, where as in case of Palar it is restricted only during flood/ rainy days. In relatively undisturbed river systems a condition known as dynamic equilibrium exists where gradual erosion of outside bends of river meanders and deposition of eroded material on inside bends occurs. Whereas the Palar is almost traversing West to East with a distinct linearity following the Palar Fault with a wide active flood plain.

The climatic regime of Vellore and northern Tamil Nadu is mostly of dry semi-arid in nature , added with very poor rainfall except for some monsoonal rains leading to less or poor inflow in the Palar and other tributaries. Hence, the depositional process is restricted to the seasonal rains when there is a flood due to excess rains in the upper riparian areas. As the River flows in the district is episodic, the process of deposition is restricted only during floods, that too active for only few days. Similarly, in case of the other tributaries the water flow is restricted to NE monsoon, however the grain size of the sand particles is coarse in nature and at places gravelly.

As the depositional regime of the rivers are episodic added with the rampant sand mining on the active flood plain and river beds of the river, aggravates widespread instability because the discontinuity in the sediment supply-transport

balance tends to migrate upstream as the river bed is eroded to make up for the supply deficiency (Knighton, I984). Thus sand mining from a relatively confined area triggers erosion of bed and banks, which in turn, increases sediment delivery to the site of original sediment removal.

Excavation of a mining pit in the active channel lowers the stream bed, creating a nick point that locally steepens channel slope and increases flow energy (Kondolf 1998). During high flows, a nick point becomes a location of bed erosion that gradually moves upstream through head cutting (Bull and Scott 1974; Hartfield l993;Kondolf I997). Head cutting mobilizes substantial quantities of stream bed sediments that are then transported downstream to deposit in the excavated area and locations further downstream. Among the two types of instream sand mining, pit excavation locally increases channel depth by creating deep pits and bar skimming increases channel width. Both conditions produce slower stream flow velocities and lower flow energies, causing sediments arriving from upstream to deposit at the mine site. As stream waters leave the area, the flow energy increases in response to the "normal" channel flow downstream, the amount of transported sediments leaving the site is now less than the sediment carrying capacity of the flow. This sediment-deficient flow of 'hungry' water picks up more sediment from the stream reach below the mine site, furthering the bed degradation process. This condition continues until the balance between input and output of sediments in the site is re-established (Williams and Wolman, 1984; Kondolf. 1997). The interplay of these two means of bed degradation and consequent river bed lowering is visible all along the active sand mining area (Fig.2 &3) near Sathampakkam area along the river bed.



Figure 2. Photograph on the left bank of Palar near Sathampakkam indicating the Sand mining activity



Figure 3. Multitemporal Satellite Image from Google Earth of different period shows the rampant in-stream sand mining in the Palar River Bed near Sathampakkam

By removing sediment from the active channel bed, in-stream mines interrupt the continuity of sediment transport through the river system, disrupting the sediment mass balance in the river downstream and inducing channel adjustments (usually incision) extending considerable distances beyond the extraction site itself. The magnitude of the impact basically depends on the magnitudes of the extraction relative to bed load sediment supply and transport through the reach (Kondolf et al., 2001).

Owing to the aforementioned reasons, replenishment of river sand is far from reality due to the non-availability of supply of sufficient fresh materials due to episodic flow of water and active sand mining. However, as discussed above the river sand from the upper reach shall relocate to the already mined pit during monsoonal floods.

VII. GENERAL PROFILE OF THE DISTRICT

Vellore is one of the biggest districts in Tamil Nadu. The district is primarily agrarian with majority of its population involved in agriculture. Leather based industry is the main industry in this district. Vellore district has an area of 6077 km². Vellore district lies between 12°15′ to 13°15′ North latitudes and 78°20′ to 79°50′ East longitudes in Tamil Nadu State. The largest telescope in India is situated in this district at Kavalur and is a centre for planetary studies. Elagiri hills situated in this

district is serving as one of the tourist/hill station in Northern Tamilnadu attaracted by peoples of Tamil Nadu, Andhra Pradesh and Karnataka states.

A. ADMINISTRATIVE DETAILS

Vellore, the Head- Quarters of Vellore District situated in 12' 35' N and 79' 9' E , has History of its own. It was under the sway of various dynasties and rulers, the prominent among them being the Pallavas, Cholas of Uraiyur, the Rashtrakutaa dynasty of Malkhed, Sambuvarayar, the rulers of Vijayanagarm, Mamathas, the Nawabs of the carnatic and the British. The Monuments found in the district give a vivid picture of the town through the ages. In the 18th Century Vellore District was the scene of some of the decisive battles fought in Ambur (1749) A.D Arcot (1751) A.D and Vandavasi (1760A.D) as a result of the long-drawn struggle between the English and the French for Supremacy. Now the Vellore district has been divided into 7 taluks, 24 blocks, 753 panchayats and 842 villages as detailed below.

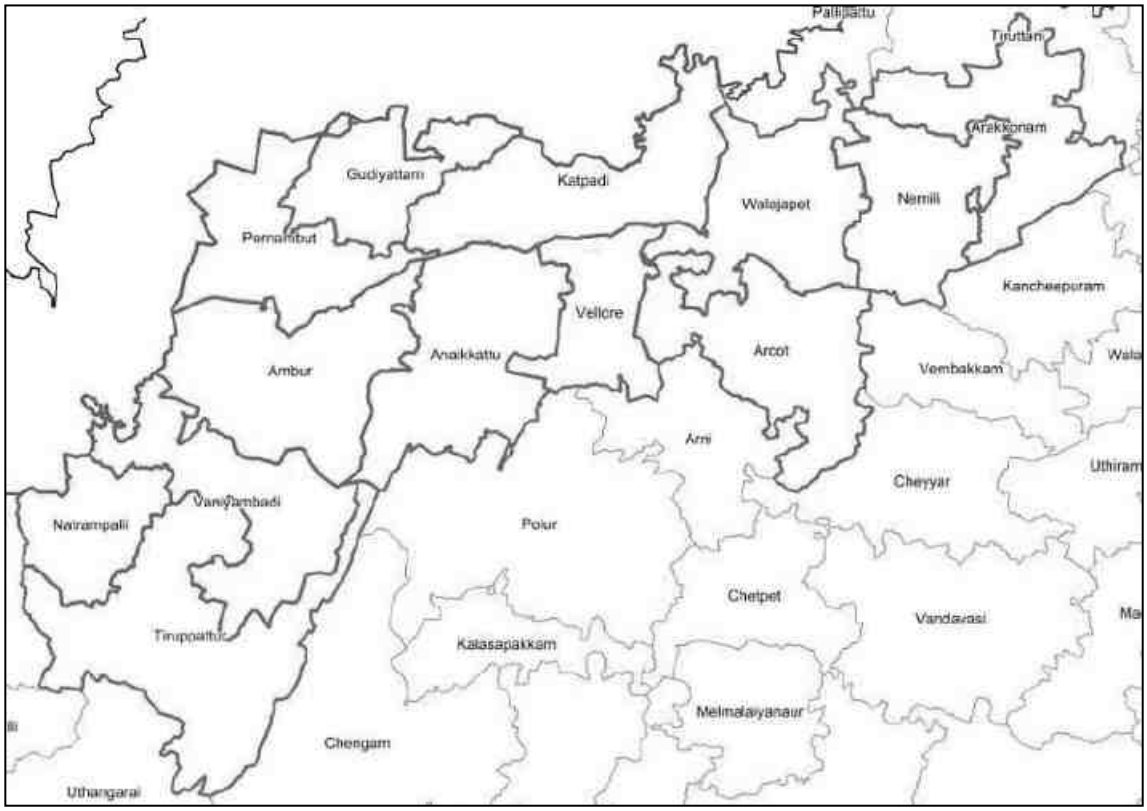


Figure 4. Taluk Map of Vellore District (red lines) with taluk boundaries of adjacent districts (green lines) (Source: BHUVAN)

Table 30. Taluk and Village Details of Vellore District (old classification)

S. No.	Taluk	No. of villages	Block	No. of villages
1	Arakonam	145	Arakonam	29
			Nemili	59
			Kaveripakkam	57
2	Wallajah	104	Wallajah	41
			Sholinghur	49
			Arcot (part)	14
3	Arcot	102	Arcot (part)	31
			Thimiri	71
4	Vellore	131	Vellore	30
			Kanniyambadi	30
			Anaicut	52
			Madhanur (part)	19
5	Gudiyatham	161	Gudiyatham	53
			Katpadi	28
			K.V.Kuppam	47
			Pernampttu (part)	33
6	Kanniyambadi	112	Pernampttu (part)	32
			Madhanur	28
			Alangayam	23
			Thirupathur	7
			Natrampalli	19
			Jolarpet	3
7	Thirupathur	87	Thirupathur (part)	13
			Natrampalli	9
			Jolarpet	24
			Alangayam	3
			Kandhili	38
	Total	842		842

B. HYDROLOGY

Major part of the district falls in Palar river basin. Palar River is the major river draining the district, flowing towards east for a distance of about 295 km. It runs parallel to the hill ranges of the Eastern Ghats for a major part of its course. It has a vast flood plain in the lower reaches, but is dry for major part of the year. Ponnaiyar, Cheyyar, Pambar and Malattar are some of the major tributaries of Palar draining the district. Almost all the streams are ephemeral in nature and are mostly structurally controlled.

The Palar is the longest of the rivers in the districts bordering Chennai and has

been a major source of drinking water for the State capital and its suburbs. The Palar and its tributaries irrigate about 300,000 hectares of agricultural land in Kancheepuram, Thiruvallur, Chennai and Vellore districts.

Analysis of surface water samples from Palar River by IAMWARM project shows pH, Electrical Conductivity, Total Hardness, Chloride and Coliform values are within the limits. Dissolved Oxygen falls below 5 mg/lit at places such as Koudanaya river, Nandhiyalam village, Rajakal head sluice, Mettur village and at stretches between Wallajabad to Asur due to mixing of Tannery effluent with water. This affects the aquaculture in the area. The river water is contaminated with domestic sewage. It is also found that Total Dissolved Solids is beyond the tolerable limit in tannery-polluted areas. Chloride is above the acceptable limit but below permissible limit. Total hardness fluctuates above and below tolerable limits and Biological Oxygen Demand is found to be very high in some head works.

i. Catchment:

Each basin has been delineated into Catchment, which are constituted by a single major river, by a group of small rivers or a major tributary of the major rivers like Vellar. The catchment in Vellore District is as follows:

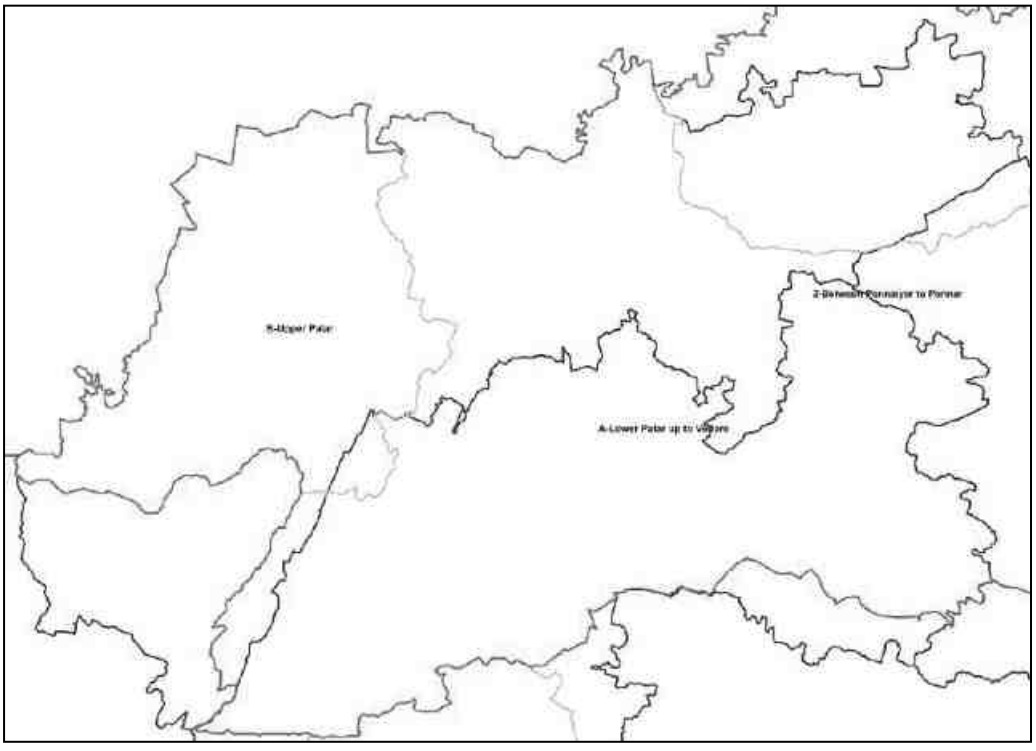


Figure 5. Catchment Map of Vellore District and adjacent areas (Source: BHUVAN)

Table 31. Details of Basin and Area of coverage

No.	Basin Code No.	Rivers covered by the Basin	Area - Sq.Km.	States covered
1	4C1	Between Cauvery and Palar	20517.575	Cuddalore, Villupuram, Salem, Tiruvannamalai, Vellore.
2	4C2	Between Pennaiyar and Pennar	15997.551	Chenglepet, Vellore, Kancheepuram, Chittur (A.P.)

ii. Sub Catchment:

Each catchment has been delineated into Sub-Catchment which are constituted by a single river, by a group of small rivers or a major tributary of the major rivers. The Sub Catchment in Vellore District is as follows:

Table 32. Details of Sub-catchment in Vellore District and adjacent areas

No.	Sub Catchment Code No.	Rivers covered by the Sub Catchment	Area Sq.Km.	Districts covered
1	4C1C	Upper Pannaiyar Beyound Sathanur Dam	6778.020	Salem, Vellore, Tiruvannamalai, Karnataka State
2	4C2A	Lower Palar upto Vellore	7444.570	Chenglepet, Vellore, Tiruvannamalai.
3	4C2B	Upper Palar	2471.180	Vellore, Tiruvannamalai, Andhra Pradesh and Karnataka Districts
4	4C2C	Miscellaneous watershed around Chennai	5582.321	Chenglepet, Vellore, Tiruvallur, Chennai.

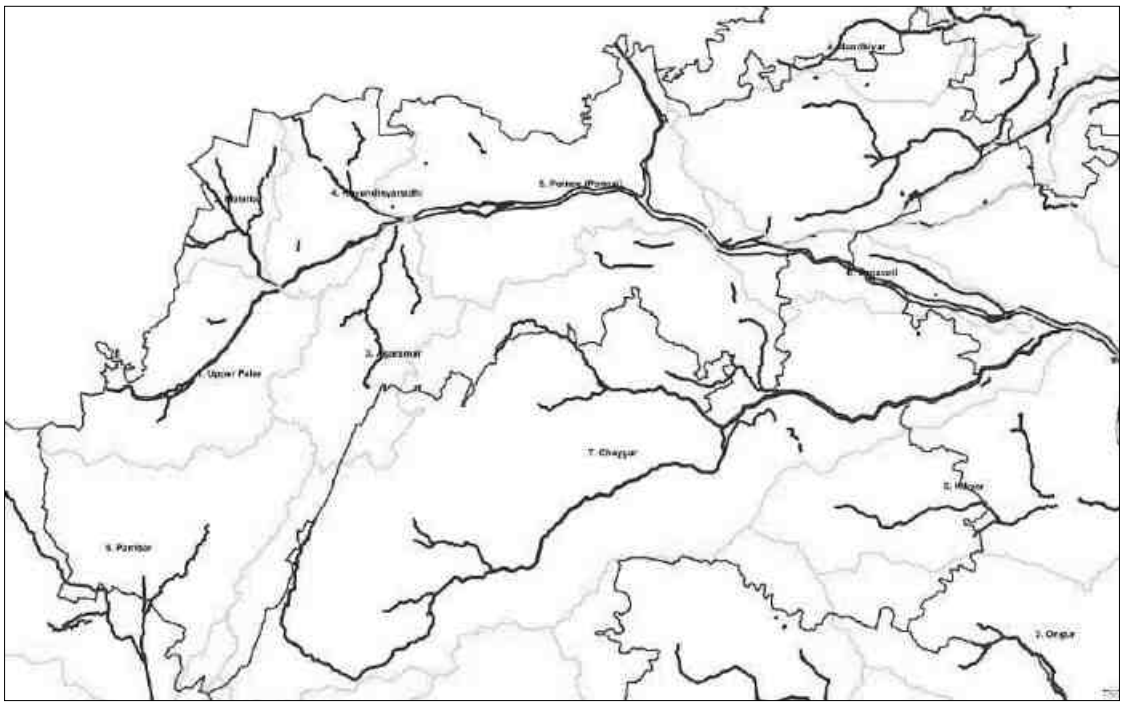


Figure 6. Sub-basin Map of Vellore District and adjacent areas (Source: BHUVAN)

iii. Watershed:

Each sub catchment has been delineated into watersheds, which are constituted by a single river by a group of small rivers or a tributary of the major rivers like Vellar. The Watersheds in Vellore District are as follows:

Table 33. Details of Watershed in parts of Vellore District and adjoining areas

No.	Watershed Code No.	Rivers covered by the Watershed	Area Sq.Km.	Parts of Taluks covered
1	4C1C1	Kallar	759.590	Tiruppattur
2	4C1C3	Mattur	1107.180	Tiruppattur
3	4C1C4	Pambar	725.230	Tiruppattur
4	4C2A3	Cheyyar Nagavadi	891.320	Arcot, Vellore
5	4C2A4	Cheyyar Nagavadi	1677.540	Tiruppattur
6	4C2A5	Cheyyar Nagavadi	1141.950	Vellore Arcot
7	4C2A6	R.B.Palar/Lower Palar	1075.920	Gudiyattam, Vellore, Arcot, Walajapet
8	4C2A7	Ponnai	549.160	Gudiyattam, Vellore, Walajapet
9	4C2B1	Agaram	572.340	Vellore, Gudiyattam, Vaniyambadi
10	4C2B2	Malattar	360.650	Vellore, Vaniyambadi, Tiruppatur
11	4C2B3	Upper Palar	1199.000	Vaniyambadi, Tiruppattur
12	4C2B6	Kuvudinya	304.150	Gudiyattam
13	4C2C3	Cooum	1876.641	Walajapet, Arkonam
14	4C2C4	Kosasthalaiyar	1235.250	Arkonam
15	4C2C5	Nandiar	630.210	Arkonam

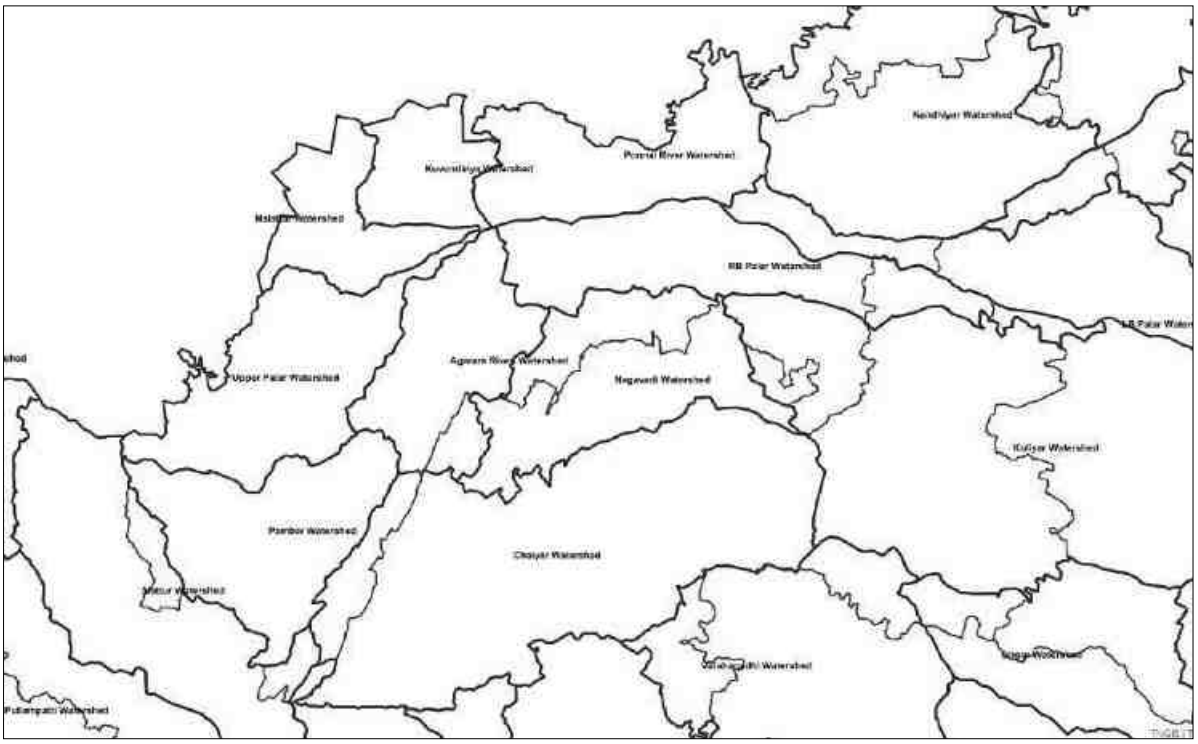


Figure 7. Watershed Map of Vellore District and adjacent areas (Source: BHUVAN)

C. SOILS

Soils have been classified into 1) Sandy soil 2) Sandy loam 3) Red loam 4) Clay 5) Clayey loam and 6) Black cotton soils. The red loamy soils are generally observed at the highest elevations whereas the black cotton soils invariably occupy the valley areas. Other types of soils are found at Intermediate elevations.

Table 34. Soil type occurrence in different parts of Vellore Dist.

Sl.No.	Taluk	Sandy and Sandy Loam	Red Loam soil	Clay and Clay Loam	Black Cotton Soil
1.	Arakonam	12234 ha 14.53 %	36711 43.6%	20495 24.34%	1393 1.65%
2.	Walajapet	6065 10.09%	24539 40.83%	13667 22.7%	170 0.28%
3.	Arcot	6261 19.32%	10852 20.8%	17956 57.9%	2232 4.27%
4.	Vellore	4902 9.16%	12461 23.3%	11832 22.13%	--
5.	Gudiyatham	5119 4.98%	29997 26.5%	24814 21.96%	--
6.	Vaniyambadi	8675 10.32%	29228 34.79%	9397 11.18%	--
7.	Thirupathur	5638 4.98%	35048 30.98%	19964 17.64%	225 0.19%

(Source: Dept. of Economics and Statistics, Govt. of T.N. 2013-14)

D. GROUND WATER SCENARIO

Vellore district is underlain by geological formations ranging in age from Archaean to Recent. In the crystalline formations comprising charnockites, gneisses and granites. In the consolidated formations, primary depositional features such as grain size are the major controlling factors.

Ground water occurs under phreatic conditions in the weathered zone and under semi- confined conditions in the fractures. The thickness of weathered zone varies from less than a metre to about 15 m in the area depending on the topography. Potential aquifer zones are also developed in these rocks by fractures persisting to depths, particularly along lineaments and their inter sections. The depth of dug wells in crystalline formations varies form 8 – 19.5 m bgl. Fracture zones have been encountered in the well down to a depth of 116 m bgl in the borehole drilled by CGWB. In Gondwana formations, ground water abstraction is through dug wells and dug cum bore wells. These formations have considerably low yield potentials compared to both hard rock and alluvium. Depth of dug wells in Gondwana sediments varies from 6 – 15 m bgl with extension of bores at the bottom ranging in depth from 15 – 25 m.

Dug wells are the most common structures in recent alluvial formations too. The depth of dug wells tapping Palar alluvium ranges from 4 – 18.70 m bgl. These formations have moderate to good yield potential in the district and can sustain pumping for 3-4 hrs even during peak summer months and have yield up to 4.6 lps. Filter points of 10 – 15 m bgl depth are also being used in these formations for tapping ground water for domestic purposes.

Table 35. Groundwater Potential as on March 2011 (as per CGWB)

Net Groundwater Availability (in MCM)	592.80
Existing Gross Groundwater draft for all users (in MCM)	621.44
Stage of Groundwater development (in %)	105%
Categorization of District	Over Exploited

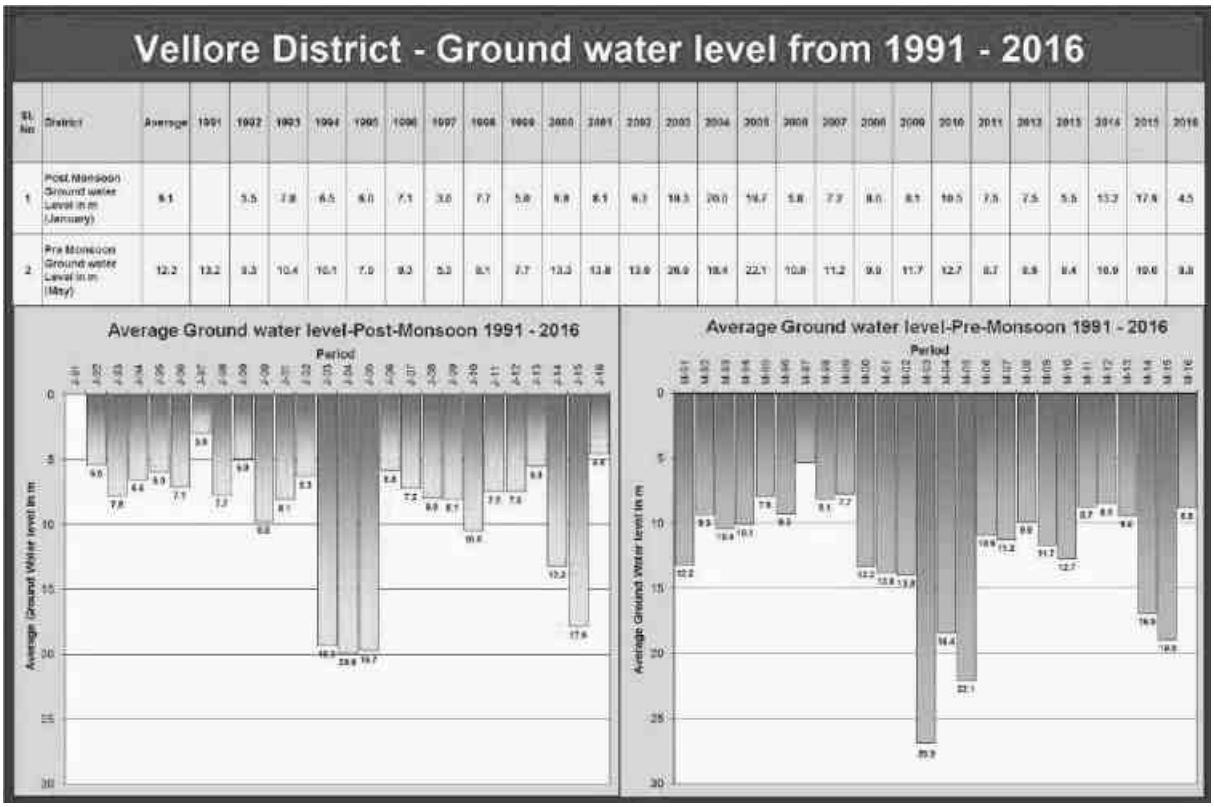
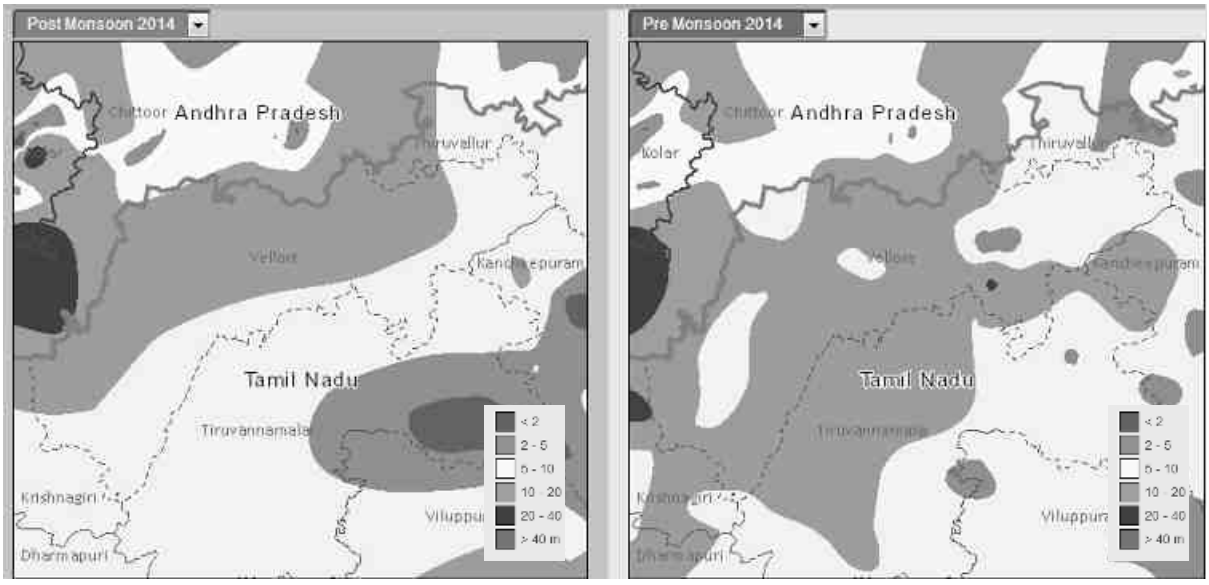


Figure 8. Ground Water Level of Vellore District from 1991- 2016



(Source: India-WRIS)

Figure 9. Ground Water Level in 2014 (Pre & Post Monsoon)

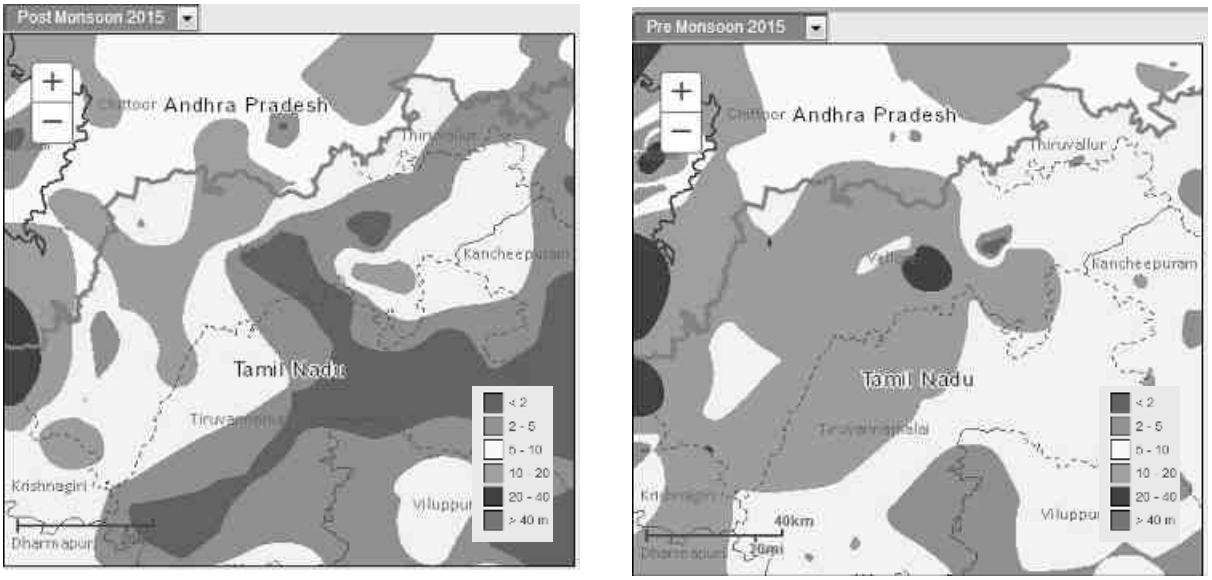
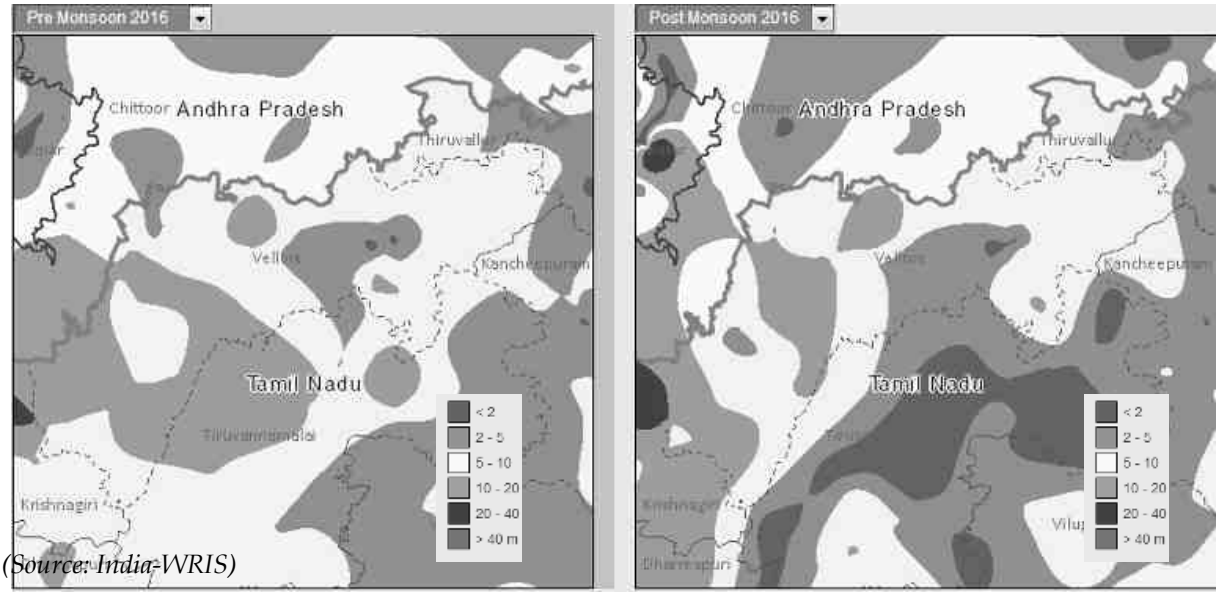


Figure 10. Ground Water Level in 2015 (Pre & Post Monsoon)



(Source: India-WRIS)

Figure 11. Ground Water Level in 2016 (Pre & Post Monsoon)

E. GROUND WATER QUALITY

Ground water in phreatic aquifers in Vellore district is, in general, colourless, odourless and slightly alkaline in nature. The specific electrical conductance (µS/cm at 25o C) of ground water in the phreatic zone during May 2006 was in the range of 935 to 7920 in the district. Conductance below 750 has been observed only in select pockets of the district. It is observed that the ground water is suitable for drinking and domestic uses in respect of all the constituents except total hardness, Chloride and Nitrate. In about 42% of samples, nitrate concentration is above permissible

limits of 100 mg/l. The incidence of high total hardness is attributed to the composition of litho units constituting the aquifers in the district, whereas nitrate pollution is most likely due to the use of fertilizers and other improper waste disposal.

Sodium Adsorption Ratio (SAR), values range from 2.4 to 19.6. With regard to irrigation suitability based on specific electrical conductance and SAR it is observed that the ground water in the phreatic zone may cause high to very high salinity hazard and medium to very high alkali hazard when used for irrigation. Proper soil management strategies are to be adopted in the major part of the district while using ground water for irrigation.

The pollution from tanneries has caused irrevocable deterioration of quality of ground water and soil in vast areas. There is an urgent need to arrest/prevent further deterioration of ground water and soil quality through a comprehensive plan. Providing common effluent treatment plant (CETP) and adoption of environment friendly technologies for tanning and safe disposal of water in the area.

The exposure of the riverbed to solar radiation following deep mining has resulted in its drying up and water availability has therefore considerably fallen and even the available water has turned saline in several places. Continued sand mining has led to obstruction in the free flow of water during the monsoon. Farmers of Vellore also complain of indiscriminate sand mining in the Palar and Ponnai rivers, which has resulted in the depletion of water in the rivers (*The Hindu, dtd. 19.11.11*).

F. INDUSTRIES

There are 120 large and medium scale industries and 11,000 small-scale industries are functioning in the basin area. This includes manufacturing of Textile, Wood, paper products rubber plastics, chemical, leather etc. There are sizable numbers of large scale industries are engaged in Leather, Automobiles, and Chemical products in this region. Vaniyambadi, Ambur, Arcot, Ranipet, Kanchepuram, Chengelput and Cheyyar. There are nearly 473 Tanneries are located in Vellore and Vaniyambadi region.

Table 36. RESULTS OF ANNUAL SURVEY OF INDUSTRIES 2012-13 IN VELLORE DISTRICT (FACTORY SECTOR)

Sl No.	Subject	Value
1	No. of factories	2074
2	Factories in Operation	741
		In lakhs
3	Fixed Capital	299208
4	Physical Working Capital	361180
5	Working Capital	419226
6	Invested Capital	660387
7	Outstanding Loan	137812

8	Interest Paid	16876
9	Total Value of Output	1781016
10	Total Input	1259804
11	Gross Value Added	521213
12	Net Value Added	488933
13	Net Fixed Capital Formation (NFCF)	20702
14	Gross Fixed Capital Formation (GFCF)	52981
15	Net Income	466662
16	Profit	311838

Source: Department of Economics and Statistics, Chennai-6.

G. SEWAGE AND SOLID WASTE

There are number of towns that are located all along the river course i.e. Vaniyambadi, Ambur, Pallikonda, Vellore, Ranipet, Arcot, Gudiyattam, Peranambattu, Arani, Tiruvettipuram, Chengam, Kanchepuram, Ayyampettai, Walajabad, Chengalpattu etc. discharging heavy amount of untreated sewage water without any treatment into the river course and nearby water source. Dumping of solid waste along the river margins and tanks, which block the natural, recharge capacity of the water source.

Vellore District is a major leather-processing centre in Tamil Nadu, with an estimated 50,000 tannery workers and has 75 percent of Tamil Nadu's tanneries and about 53 % of India's tanneries. Elevated chromium concentration in the effluents from tanneries poses a serious environmental concern in Vellore district, home to innumerable small and large-scale tanneries. Ranipet, an industrial zone present in the bank of Palar River was reported as the most polluted rivers of the world by Blacksmith Institute in 2006. The tolerance of soil bacteria to heavy metals has been proposed as an indicator of potential toxicity of metals to other forms of life (Journal of Environment and Earth Science,2(2):112 - 117,2010). The high pollution level of the Palar is because the tanneries are completely dependent on the river for their fresh water used in the production processes. Everyday hundreds of tankers transport fresh water to the tanneries and all the effluent is directed back to the riverbed. The Palar River bed is dry most of the year because it is a seasonal river. It stirs back to life every year only during the monsoon. When the river is devoid of water the riverbed is quarried for its 15 feet of sand. Palar is the primary source of drinking water for the residents of Vellore Taluk and in other parts of the district.

H. AGRICULTURE

Rice, Maize, Ragi, Sugarcane, Pulses, Groundnut, Banana and Coconut, are cultivated extensively in Vellore district, while Cotton is cultivated in a few places. The total land used for cultivation of these crops is 2,76,062 ha. The major crop in Vellore District/ Palar basin is paddy.

Table 37. Agricultural activities in Vellore District

Year: 2015-16

Sl.No.	Crop	Area (in '000' Hect.)
1	Paddy	51.771
2	Cholam	0.029
3	Cumbu	0.729
4	Maize	3.347
5	Ragi	4.281
6	Sugarcane	7.297
7	Onion	0.056
8	Fruits and Vegetables	9.761
9	Gingelly	0.107
10	Groundnut	3.105
11	Coconut	20.674
12	Sunflower	0.040
13	Cotton	0.094
14	Greengram	1.205
15	Blackgram	0.925
16	Chillies	0.905
17	Turmeric	0.413

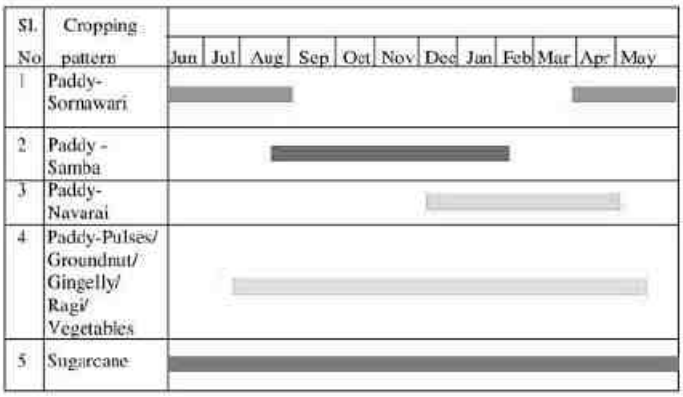


Figure 12. Crop pattern season wise

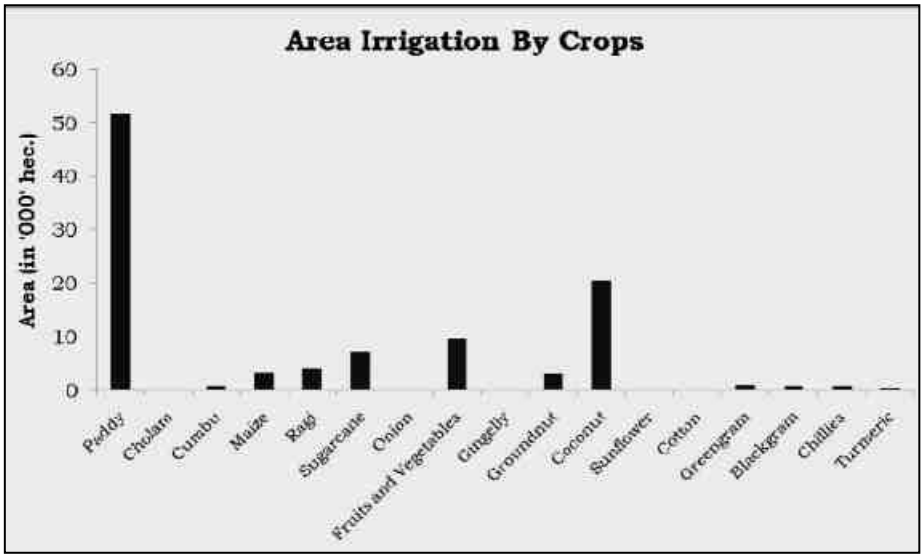


Figure 13. Area irrigation by crop types

I. SEISMICITY

Historical data on seismic activity occurred in and around Vellore district has been compiled by GSI from various sources, Viz., (Oldham, 1883-GSI, IMD, ISC, SUCAT & USGS). Seismographs have recorded three earthquake tremors in the recent past on 07.06.2008, 29.08.2011 and 26.09.2013 of 3.7M w, 3.1M w and 3.4M w respectively indicate that the area is prone to seismic activity. However, the historical data compiled over 100 years indicate all of the earthquake events occurred in the Vellore district and surrounding areas are less than 5.0M w , which enunciates that the region can receive only moderate magnitude earthquakes. Further, the focal depth of most of these earthquake events is in the range of 13.2 to 19 Km, which means that shallow focus earthquake generally occur in the area. Based on the recent tremors in Vellore District, GSI has carried out the Macroseismic survey around Athimagulapalli village in Ambur Taluk and in Tirupattur, Kunichi, Natham, Sundarampalli, Thoranampatti, Perambuttu, Rachamangalam villages of Tirupattur Taluk in Vellore District. Based on the preliminary survey of the recent event GSI has recommended for detailed geological and geophysical surveys to ascertain the active nature of fault/fractures and associated ground/seismic activities. Further, as none of these recent seismic events have been recorded by the major seismological observatories of India, it has been suggested to carry out micro-seismic survey by temporary installation of 3-4 seismographs in the area, which can record magnitude and distribution of low magnitude earthquake array, if any.

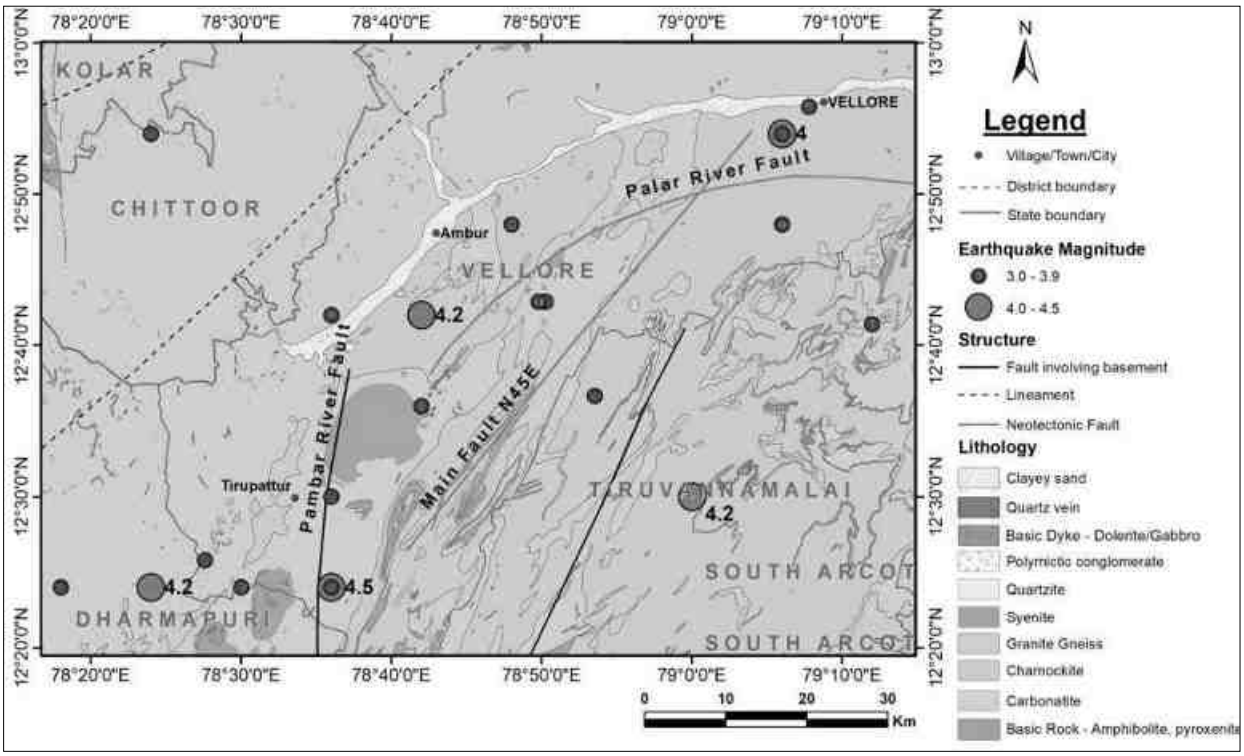


Figure 14. Geo-seismological map of Vellore district and surrounding areas (Source: GSI Seismotectonic Atlas, 2000)

It has also been recommended to establish a permanent seismograph station in the Vellore District, so that any minor activity can also be monitored properly in future. Since the low magnitude seismic event clusters are observed historically around this area.

As per the Seismic Zonation Map of India, the Vellore district falls under the Zone II of seismic zones classification. The basic seismic coefficient for Palar basin is 0.02.

J. GEOTECHNICAL CHARACTERISTICS

Geotechnically the area has been demarcated into four Engineering geological provinces based on permeability, bearing capacity and foundation characteristics of rocks. The permeability is high with low bearing capacity and poor foundation characters in alluvium and clay. The Gondwana rocks show low to moderately high permeability, variable bearing capacity and poor to fair foundation character. The hard rocks comprising charnockites, granites, gneisses show low permeability, medium to high bearing capacity and good to very good foundation characters.

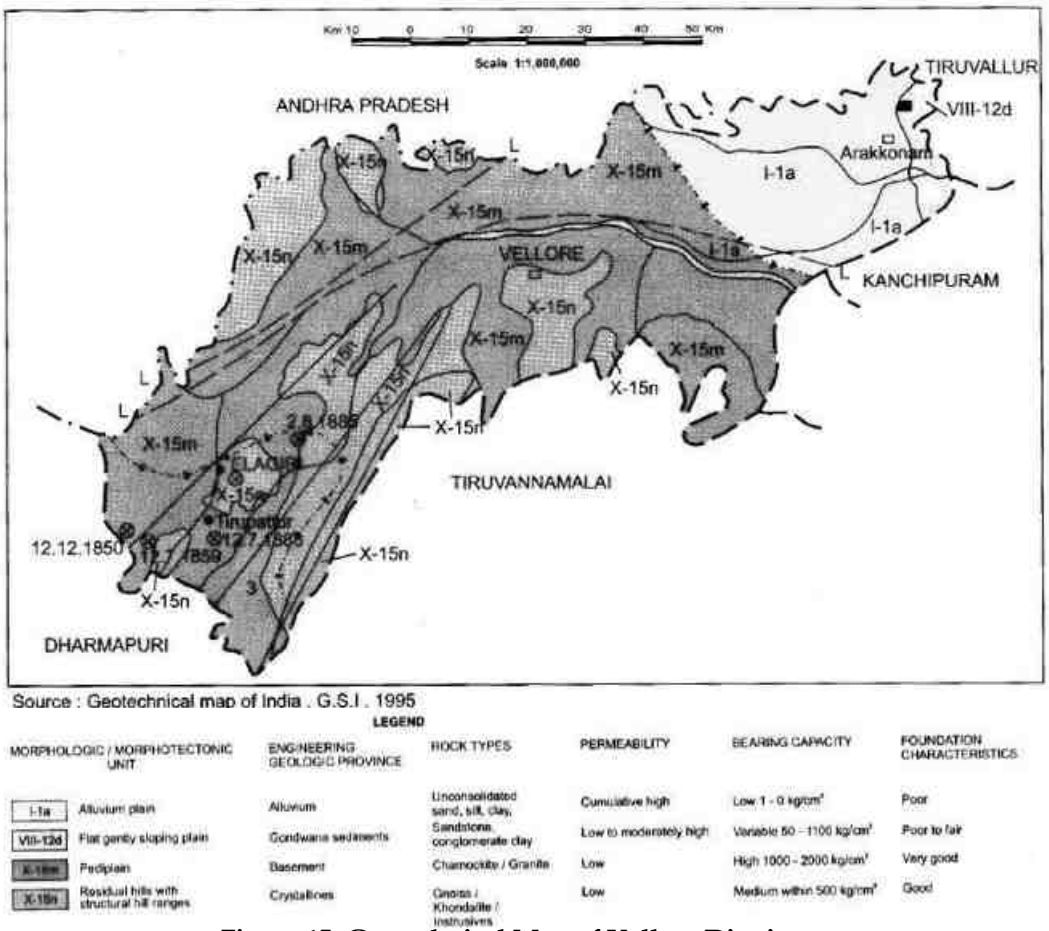


Figure 15. Geotechnical Map of Vellore District

K. FOREST

Forest Department records show a total extent of 1,92,461 ha under forests in the Vellore district. Among this area 89 % is Reserve forest, 2.6 % is Reserve Land and 8.4 % under unclassified forests.

Table 38. Forest Division and Ranges in Vellore District

S.No	Division Name	Range Name
1	Tirupattur	Alangayam
2	Tirupattur	Ambur
3	Tirupattur	Singarapettai
4	Tirupattur	Tirupattur
5	Tiruvannamalai North	Arani
6	Tiruvannamalai North	Jamnamathur
7	Tiruvannamalai North	Melpattu
8	Tiruvannamalai North	Nadanur
9	Tiruvannamalai North	Polur
10	Tiruvannamalai North	Santhavasal
11	Tiruvannamalai South	Chengam
12	Tiruvannamalai South	Pudupalayam
13	Tiruvannamalai South	Sathanur Dam
14	Tiruvannamalai South	Thanippadi
15	Tiruvannamalai South	Tiruvannamalai
16	Vellore	Amirithi
17	Vellore	Arcot
18	Vellore	Gudiyatham
19	Vellore	Odugathur
20	Vellore	Pernampet
21	Vellore	Vellore

Table 38a. Distribution of forest types in Vellore District in 2016 & 2017

Year	Area	Very Dense Forest	Moderate Dense Forest	Open Forest	Total	Scrub
	sq.km					
2016	6,077	187	680	990	1,857	89
2017	6,075	203	935	675	1,813	76

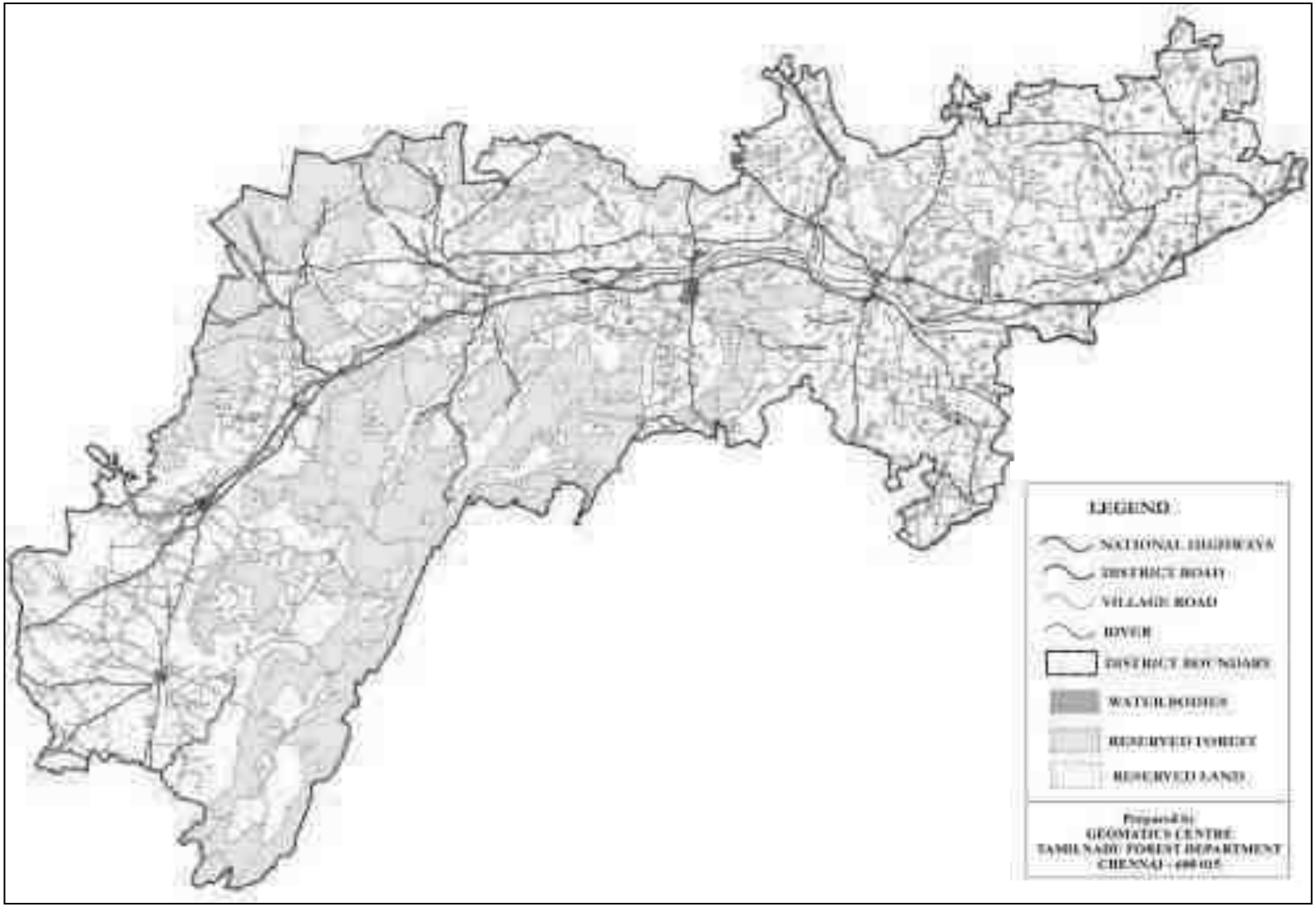


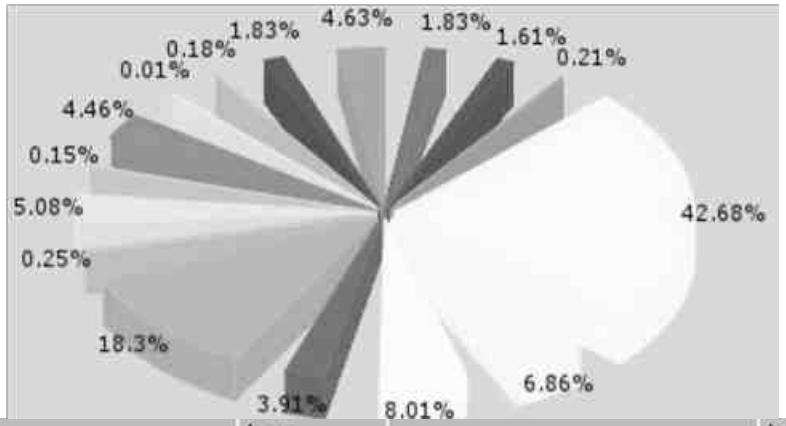
Figure 16. Forest Map of Vellore District

VIII. LAND UTILISATION PATTERN IN THE DISTRICT

Out of the total area of 6077 sq. km., the Vellore District hosts the major land use as the Agriculture with Crop land and Plantation type land covers, followed by the forest cover and so on.

Table 39. Land use classification and it's coverage in Vellore District

Sl.No.	Land Use Classification	Area in Hectares
1.	Forest	5648
2.	Barren and Uncultivable uses	20443
3.	Land put to Non-Agricultural uses	80725
4.	Cultivable Waste	5673
5.	Permanent Pastures and Other Grazing Land	3922
6.	Land Under Miscellaneous Tree Crops and Groves not included in	2937
7.	Current Fallows	77453
8.	Other Fallows Land	74369
9.	Net Area Sown	164210
10	Reserve Forest	156638
11.	Geographical Area According to Village Papers	592018
12.	Total Cropped Area	202453
13.	Area sown more than once	38244



LULC Class	Area (Sq.Km)	LULC Class	Area (Sq.Km)
Builtup,Urban	110.98	Builtup,Rural	97.8
Builtup,Mining	13.03	Agriculture,Crop land	2593.47
Agriculture,Plantation	416.87	Agriculture,Fallow	486.59
Forest,Evergreen/ Semi evergreen	237.63	Forest,Deciduous	1111.98
Forest,Forest Plantation	15.3	Forest,Scrub Forest	309
Barren/unculturable/ Wastelands, Salt Affected land	9.38	Barren/unculturable/ Wastelands, Scrub land	271.01
Barren/unculturable/ Wastelands, Sandy area	0.81	Barren/unculturable/ Wastelands, Barren rocky	10.77
Wetlands/Water Bodies, River/Stream/canals	111.16	Wetlands/Water Bodies, Reservoir/Lakes/Ponds	281.2
Total			6077.00

Figure 17. Land Use Land Cover Details of Vellore District

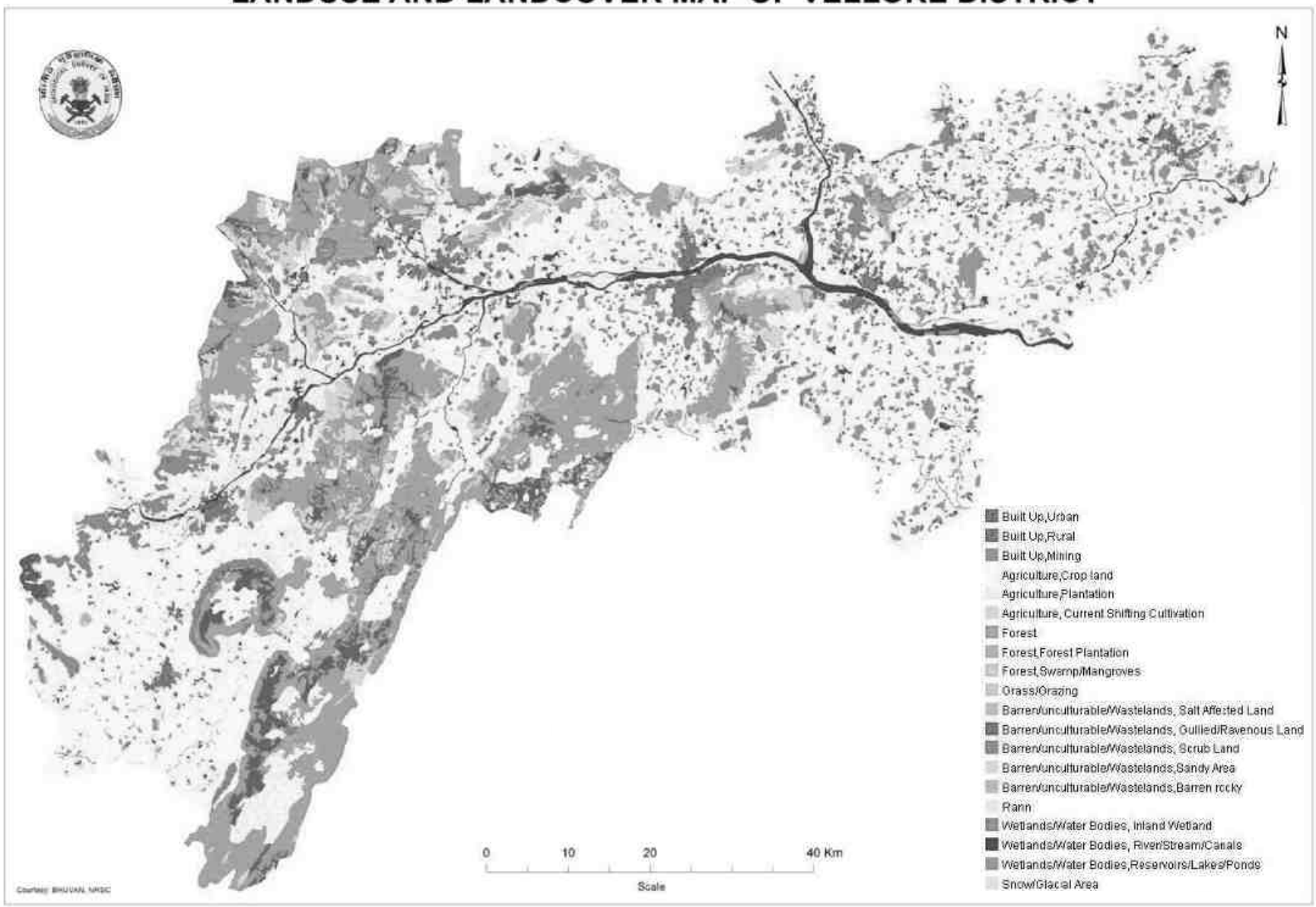


Figure 18. Land Use Land Cover Map of Vellore District

IX. PHYSIOGRAPHY OF THE DISTRICT

Vellore district can be classified into two major physiographic divisions i) Hilly terrain in the eastern and southwestern parts
ii) Plain regions in the eastern part.

The western part of the district is occupied by the Javadi and Elagiri hills. In the Elagiri hills, a few peaks 1121 m, 942 m, 841 m raise above, are prominent. In Javadi hills, the peaks 1076 m, 975 m and 99 m are prominent. The eastern areas of Vellore are undulating rugged plains with isolated hillocks of 120 m and 140 m above msl. The area is drained by Palar, Cheyyar and smaller distributary streams. The drainage is sub-dendritic and most of the streams are ephemeral. The Palar Flood Plain becomes broader on entering into the Kancheepuram district whereas in the west, it is restricted to the river bed only.

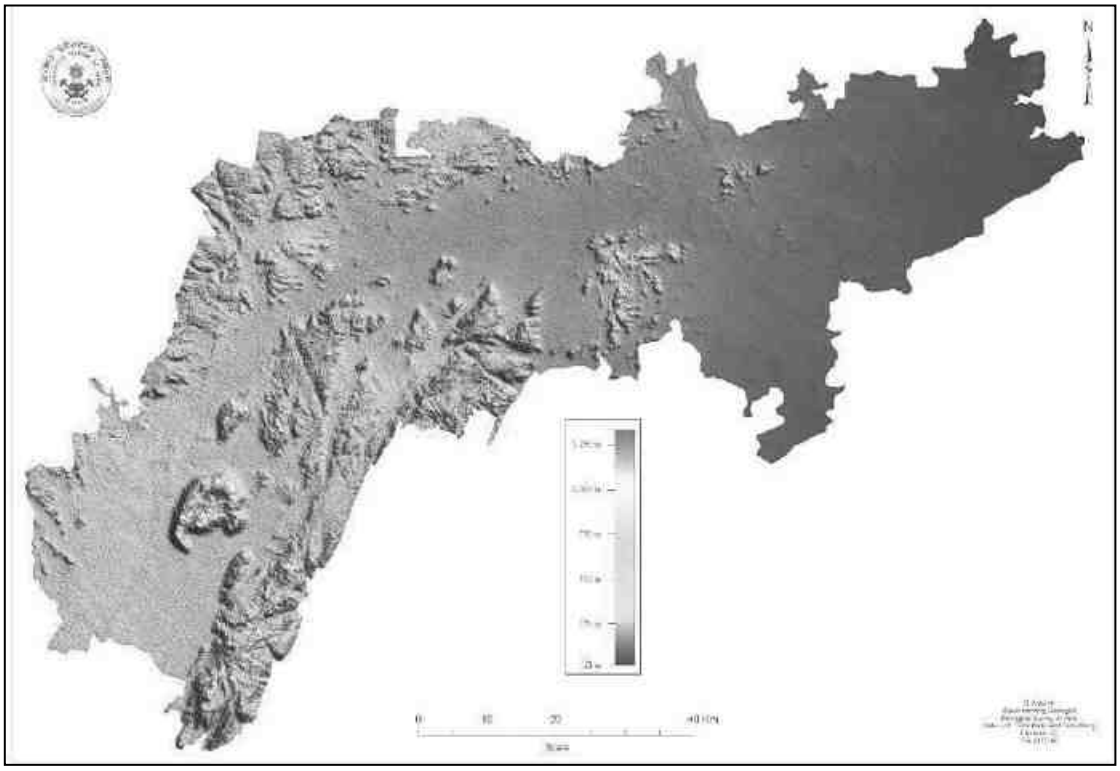


Figure 19. Shaded Relief Map of Vellore District

The Fig.19 represents the shaded relief map of the Vellore District representing the relative elevation differences in the district marked by hillocks in the south western part of the district viz., Elagiri hills ranging upto 1330 m above mean sea level. The lowest of 21 m at the eastern margin of the district in the alluvial plains of Palar River.

The geomorphic unit identified in the district are broadly classified as Structural Origin, Denudational Origin, Fluvial Origin, Coastal Origin and Antropogenic origin including the water bodies. It is further classified as given in Table 40 and shown in Fig. 21 in the Geomorphological Map retrieved from NRSC prepared in 1:50,000 scale in collaboration with GSI.

Table 40. Geomorphic Units

Structural Origin	Moderately Dissected Hills and Valleys
	Low Dissected Hills and Valleys
Denudational Origin	Moderately Dissected Hills and Valleys
	Low Dissected Hills and Valleys
	Pediment-PediPlain Complex
Fluvial Origin	Active Flood Plain
Coastal Origin	Older Deltaic Plain
	Older Coastal Plain
Anthropogenic Origin	Anthropogenic Terrain
Waterbodies	

In addition, a number of lineaments have been identified from remotely sensed data. In the eastern and southwestern part of the district, the predominant trend of lineament is NE-SW, whereas in the central part, both NE-SW and NW-SE trending lineaments have been identified. Traces of major lineaments identified in the area have been shown in the lineament map in Fig. 20 retrieved from NRSC prepared in 1:50,000 scale in collaboration with GSI.

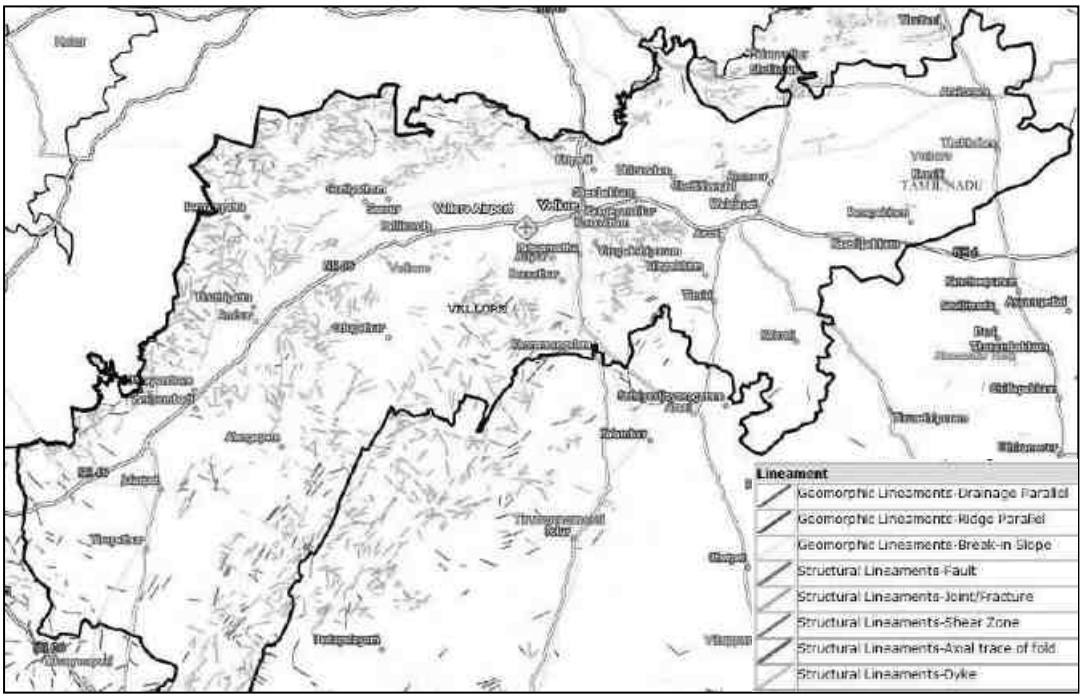


Figure 20. Lineament Map of Vellore District and surrounding area

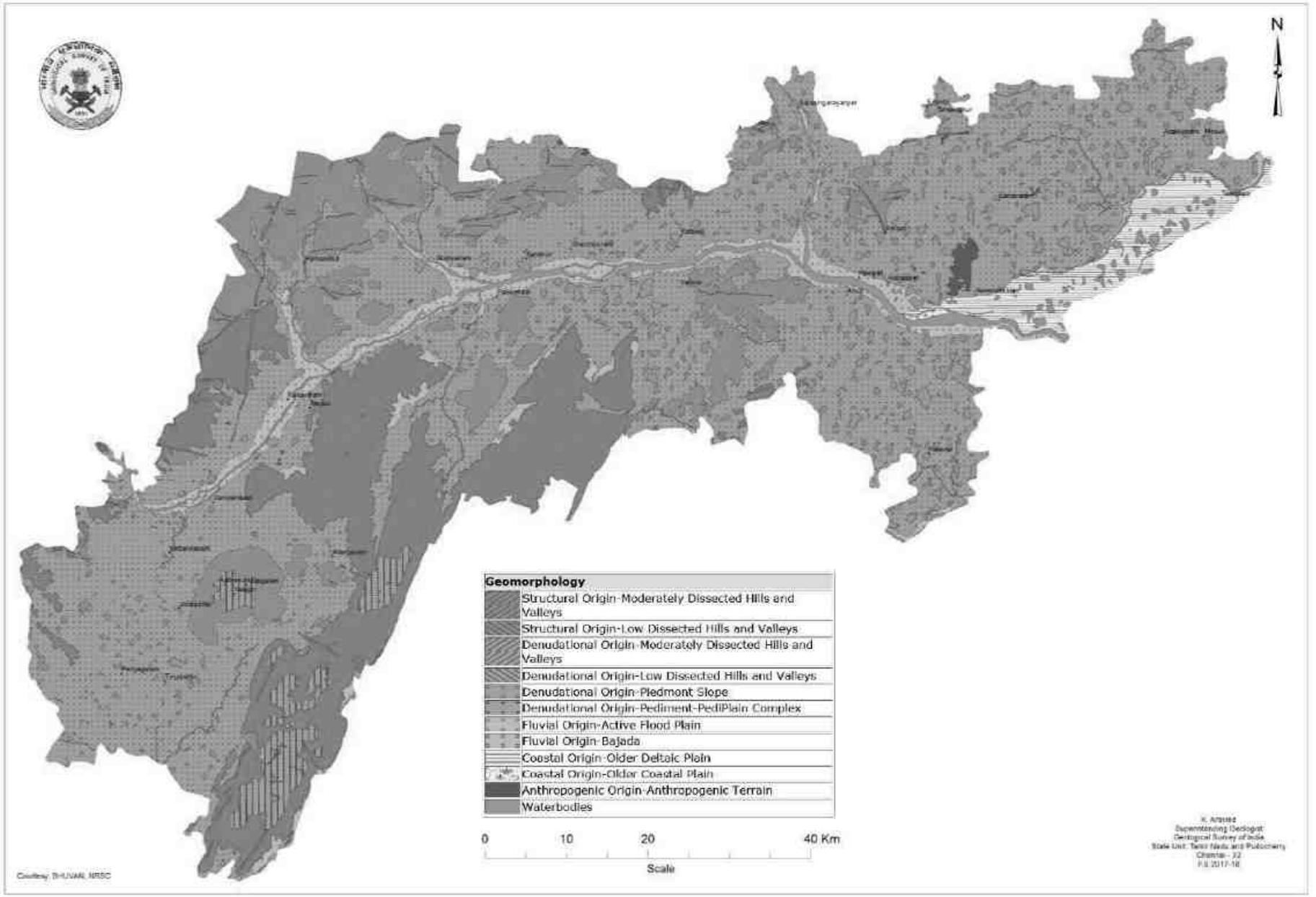


Figure 21. Geomorphological Map of Vellore District

X. RAINFALL

The average annual rainfall is 795mm, out of which Northeast monsoon contributes to 535mm and the Southwest monsoon contributed to 442mm. The Southwest monsoon, with an onset in June and lasting up to August, brings scanty rainfall. The bulk of the rainfall is received during the Northeast monsoon in October, November and December. The humidity ranges from 40%–63% during summer and 67%–86% during winter.

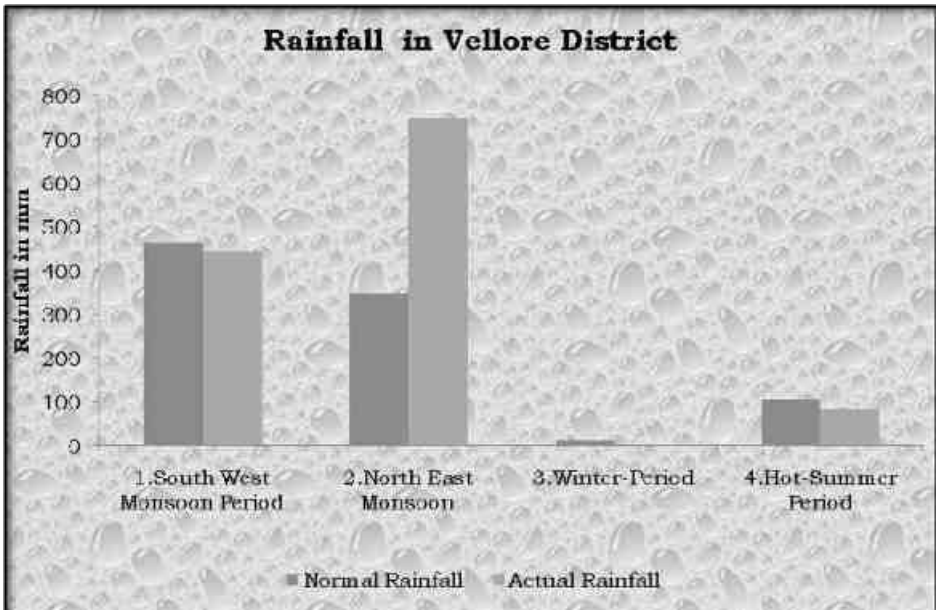


Figure 22. Rainfall in Vellore District

As per the study of the Tamil Nadu state Climate Change cell, Department of Environment, Govt. of Tamil Nadu The annual rainfall for Vellore may reduce by 5.0% by the end of the century.

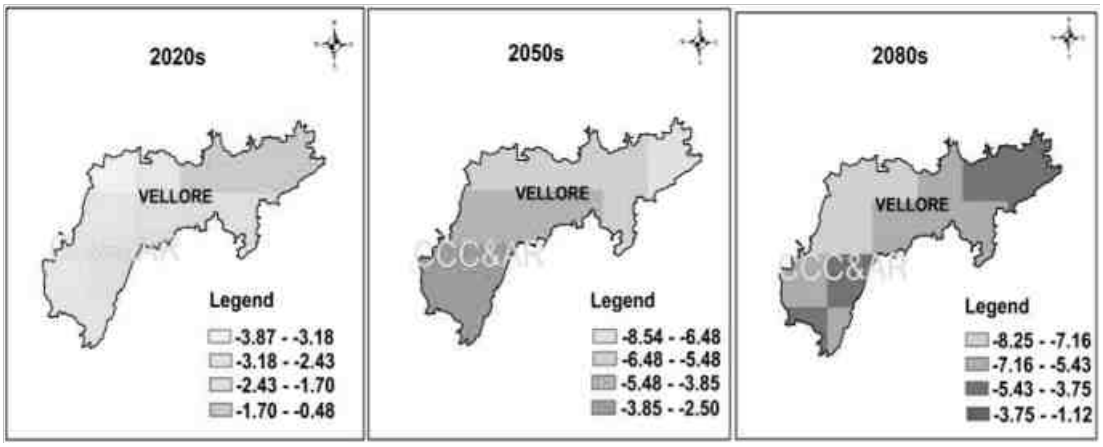


Figure 23. Change in Annual Rainfall for the period 2020s,2050s and 2080s

Table 41. Percent change in Annual Rainfall

Parameter	2020s	2050s	2080s
Annual Rainfall	-2.0%	-5.0%	-5.0%

Table 42. Monthly Rainfall Data- Month wise and Season Wise

(In Millimetres) Year: 2015-2016

Period (1)	Normal Rainfall (2)	Actual Rainfall (3)	% Dep.
1.South West Monsoon Period			
June'15	**65.9**	**103.4**	**57**
July'15	**107.2**	**56.6**	**-47**
August'15	**129.0**	**153.3**	**19**
September'15	**163.9**	**131.5**	**-20**
Total	**466.0**	**444.8**	**-5**
2.North East Monsoon			
October'15	**163.2**	**140.2**	**-14**
November'15	**127.2**	**524.7**	**313**
December'15	**58.3**	**82.8**	**42**
Total	**348.7**	**747.7**	**114**
3.Winter-Period			
January'16	**8.1**	**0.9**	**-89**
February'16	**6.8**	**0**	**-100**
Total	**14.9**	**0.9**	**-94**
4.Hot-Summer Period			
March'16	**9.2**	**0.2**	**-98**
April'16	**22.3**	**0**	**-100**
May'16	**75.0**	**81.8**	**9**
Total	**106.5**	**82.0**	**-23**
TOTAL	**936.1**	**1275.4**	**36**

Source: Dept. of Economics & Statistics, Chennai-6.

Table 43. TIME SERIES DATA OF RAINFALL BY SEASONS (LAST 20 YEARS)
Year: 1996-97 to 2015-16

S.No	Year	South West Monsoon		North East Monsoon		Winter Season		Hot Weather Season		Total		% Deviation from Normal
		Normal	Actual	Normal	Actual	Normal	Actual	Normal	Actual	Normal	Actual	
1	96-97	448.8	819.2	379.3	616.2	23.2	8.9	102.1	99.7	953.4	1544.6	(+)62.0
2	97-98	448.8	288.0	379.3	312.1	23.2	0.0	102.1	27.9	953.4	628.0	(-)34.1
3	98-99	433.1	509.1	362.2	436.2	23.6	30.9	105.1	65.2	924.0	1012.4	(+)9.5
4	99-00	433.1	194.0	362.2	295.2	23.6	30.9	105.1	62.1	924.0	582.2	(-)65.8
5	2000-01	435.0	415.3	362.2	238.3	23.4	3.7	105.7	106.8	925.7	764.1	(-)17.5
6	2001-02	435.00	369.9	362.2	243.4	23.4	2.1	102.2	76.4	922.8	691.8	(-)21.32
7	2002-03	451.1	254.2	351.7	251.4	18.2	0.0	101.4	65.0	922.4	570.6	(-)38.1
8	2003-04	442.0	582.9	353.0	242.2	20.3	1.7	101.7	282.9	917.0	1109.9	(+)21.0
9	2004-05	442.0	379.3	353.0	240.4	20.3	1.5	101.7	184.5	917.0	805.7	(-)12.1
10	2005-06	442.0	407.5	353.0	685.1	20.3	4.8	101.7	200.3	917.0	1297.7	(+)41.52
11	2006-07	442.0	422.1	353.0	308.1	20.3	1.0	101.7	124.3	917.0	855.5	(-)6.0
12	2007-08	442.0	579.5	353.0	441.1	20.3	14.3	101.7	160.8	917.0	1195.7	(+)30.4
13	2008-09	442.0	312.3	353.0	370.5	20.3	2.4	101.7	83.1	917.0	768.3	(-)16.2
14	2009-10	442.0	434.4	353.0	238.8	20.3	9.5	101.7	132.1	917.0	814.8	(-)11.1
15	2010-11	442.0	456.8	353.0	410.7	14.9	34.4	106.5	110.0	916.4	1011.9	(+)10.42
16	2011-12	535.8	441.0	378.4	438.7	13.9	8.1	102.2	103.7	1030.3	991.5	(-)3.78
17	2012-13	535.8	420.2	378.4	461.6	13.9	36.7	102.2	85.8	1030.3	1004.1	(-)2.54
18	2013-14	466.1	453.9	348.7	204.6	14.9	4.8	106.5	97.4	936.2	760.7	(-)18.7
19	2014-15	466.1	400.0	348.7	183.5	14.9	1.6	106.5	165.7	936.2	750.8	(-)19.8
20	2015-16	466	444.8	348.7	747.7	14.9	0.9	106.5	82	936.1	1275.4	(+)36.0

Source : Department of Economics and Statistics, Govt. of T.N.

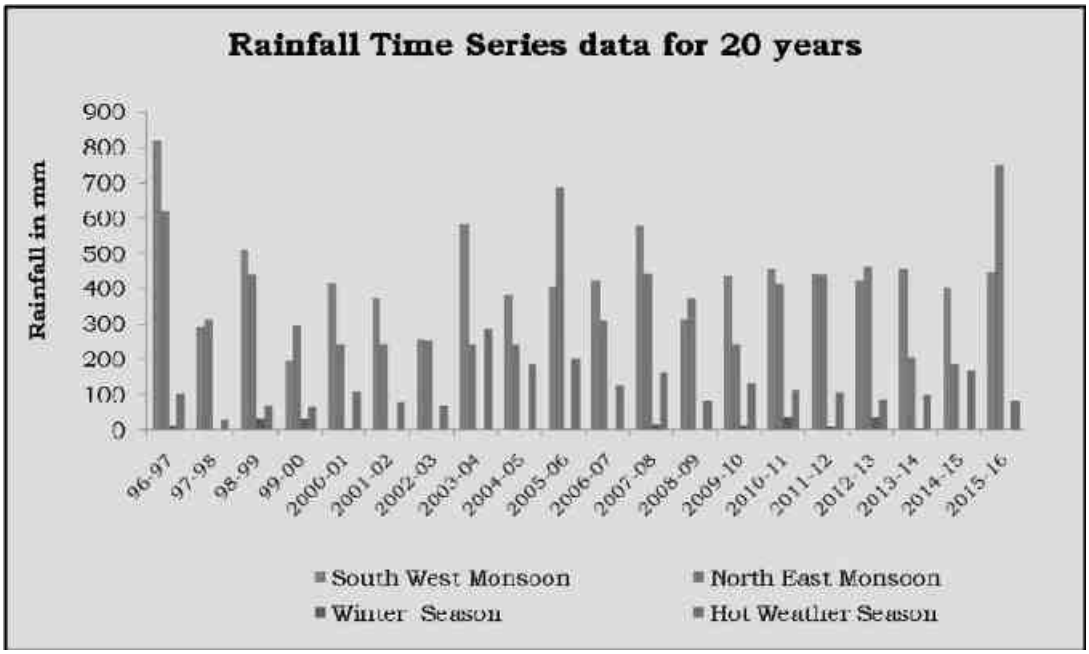


Figure 24. Rainfall Time series data for 20 years in Vellore District

XI. GEOLOGY AND MINERAL WEALTH

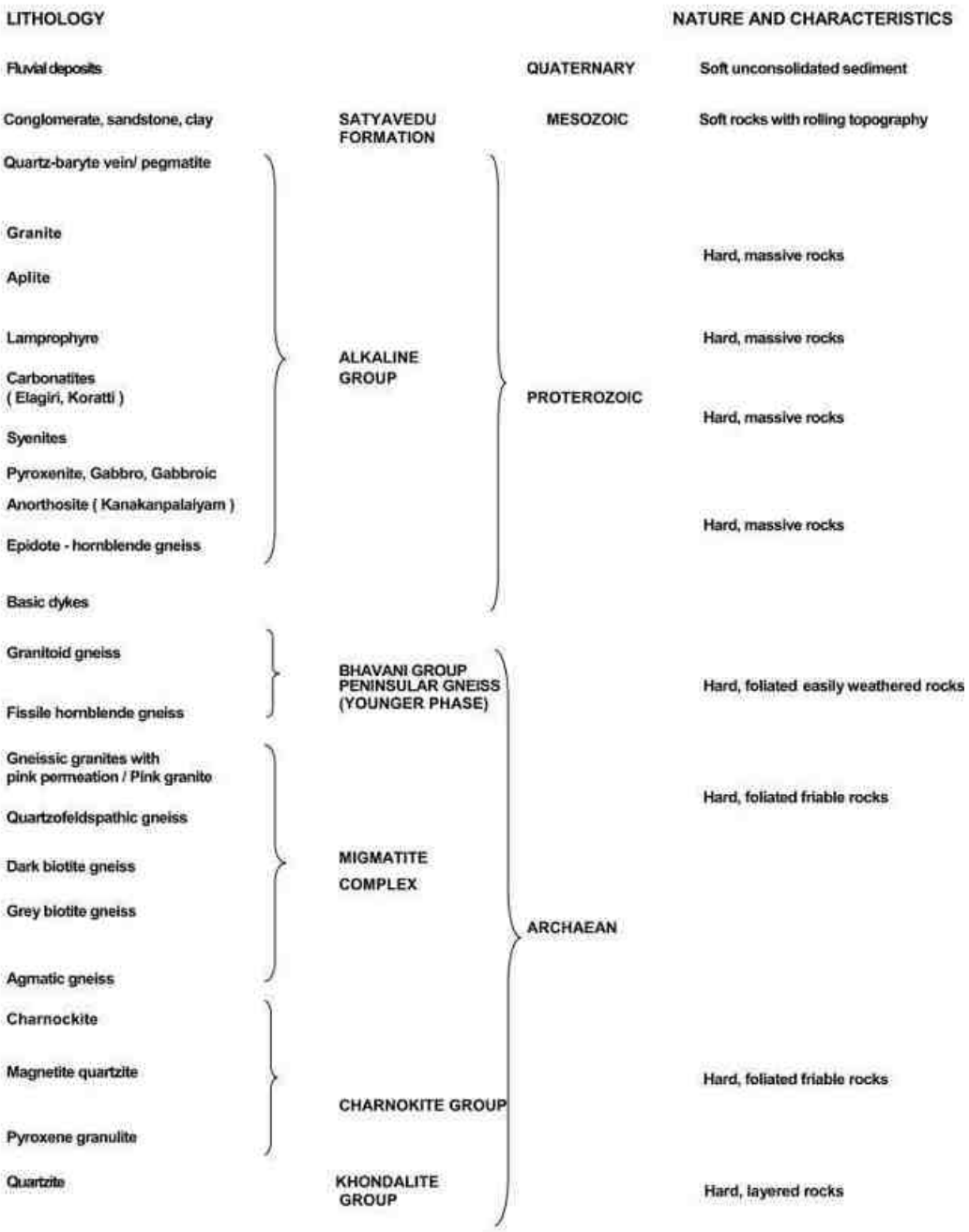
A. GEOLOGY:

The major part of the district is covered by metamorphosed crystalline rocks of the Charnockite Group and the Migmatite Complex of Archaean age. South of Palar River, the area where the Charnockite Group of rocks are spread over comprises charnockite, pyroxene granulite, magnetite quartzites and younger basic dykes intruding into them. **(Plate – 1)**

The Migmatite Complex comprising biotite gneisses, agmatitic gneisses, sub-augen gneiss, quartzofeldspathic gneisses and gneissic granites with pink permeation is seen around Elagiri and Koratti hills.

The Peninsular Gneissic Complex consisting of fissile hornblende gneiss, granitoid gneiss and younger granites occur to the north of Palar River. Younger dykes are profusely noted in these gneisses. The Proterozoic Alkaline group of rocks occurs in the Koratti and Elagiri hills.

STRATIGRAPHY OF VELLORE DISTRICT



The Alkaline carbonatite complexes located in a 250 km long and 25 km wide belt, trending NNE-SSW, extend from Gudiyattam in the north to Bhavani in the south. The Late Proterozoic period in Tamil Nadu witnessed large-scale extensional tectonism with the formation of deep crustal fractures with intrusion of alkaline related plutons and granites. The alkaline related plutonism was widespread in the north in parts of Vellore, Dharmapuri and Salem Districts, where a number of ultramafic-syenite-carbonatite bodies of Elagiri, Koratti, Samalpatti and Pakkanadu occur in a NNE-SSW trending zone extending from Gudiyattam in the north to Bhavani in the south over about 200km. A number of smaller ultramafic-syenite-

carbonatite bodies also occur along sub-parallel NNESSW trending fault/shear zones on both sides of the main zone of alkaline activity. Recent studies indicate that the alkaline plutonic activity extends further NNE, beyond River Palar

The complexes are emplaced into the charcnockite group of rocks and their migmatitic equivalents of amphibolite facies grade. These complexes have formed the locci of mineralisation. The major lithounits forming the alkaline group are epidote hornblende gneiss, pyroxenite, gabbro, gabbroic anorthosite, syenite, carbonatite with lamprophyre dykes and quartz-barytes veins. Banded magnetite quartzite, charnockite and pyroxene granulite occur as enclaves.

The Koratti syenite carbonatite complex occurring in near the Koratti Village is an inverted pear shaped body extending into Krishnagiri district. The Elagiri syenite comprises porphyritic, pink grey syenite and medium grained quartz syenite. These are emplaced into the charnockites and Peninsular Gneissic Complex comprising white silvery granitic gneiss, granitoid gneiss, agmatitic gneiss and amphibolite. Lamprophyre and dolerite dykes occur as basic intrusives in the gneisses. The Younger intrusives in this area are quartz veins, quartz baryte veins and aplite veins.

In northern part of Arakkonam, Satyavedu Formation is exposed comprising conglomerate, sandstone and clay of lower Cretaceous age. Quaternary formations are represented by the Palar Alluvium which increases in thickness towards east, comprising sand, silt and clay admixtures.

The foliation of the gneiss varies from N15°E-S15°W to N80°E-S80°W. F2 folds are prominent in the Javadi hills. The patterns of the feldspars show inward dips suggesting a basinal structure. The Pambar Shear trends NNE-SSW to NE-SW and extends on the western side of the area along the river course. Three generations of folds have been established in the area with minor, younger folds.

Elagiri Syenites: The Elagiri Syenite Complex comprises ultramafic, mafic and a variety of syenites with injections of carbonatite, felsite, lamprophyre, pegmatite and quartz / barite veins. Very coarse, grey syenite occupy the southeastern part of the hill and the plains to the south are the oldest unit within the syenite complex. Grey and pink porphyritic syenite and medium grained syenite occur in succession to the north in an arcuate shape. Pegmatoidal syenite is exposed in the lower slopes on the northwestern part of the massif and leuco syenite in the lower slopes of the NE and ESE parts. Porphyritic hornblende syenite is found near the contact between grey porphyritic syenite and pyroxenite. Aplitic syenite veins are seen at many places in the eastern plains. A number of thin pegmatite veins are exposed along the southern slopes and quartz veins on the plains to the northeast of the hill. Carbonatite boulders are seen along the southern slopes. A diatreme igneous breccia is exposed to the north of the hill. Shearing effects are observed all along the peripheries of the Elagiri

hill, besides some minor shears within the syenite. Different generation of alkaline ultrabasic rocks, syenite and their xenoliths suggest multiple tectonic episodes in the formation of the Elagiri syenite pluton.

The contact between the alkaline pluton and the country is not exposed due to thick soil cover. Nevertheless, at places particularly in the western and southern margin close spaced intense fracturing in both alkaline pluton and the country rock has been observed. Primary flow banding defined by orientation of feldspars mega-crysts is developed in the syenites in the southern and western part of the complex. These primary foliations/ flow bandings show a steep inward dip (i.e. towards the center of the complex), signifying a conical shape of the intrusions. There are number of shear planes cutting across the syenites, noted in the complex. The pyroxenites show effect of feldspathisation near the southern contact with syenites.

"Teardrop" structure of pyroxenites has been reported in the syenites more particularly in the southern margin and in the very coarse pink syenites. The xenoliths of pyroxenites are about a few cm in diameter to as much as 10 cm in length and mostly are lenticular. It shows chilled margin around the individual xenoliths and a portion of it shows protrusion into the syenite mass.

The central portion of the area is plain and the remaining area is hilly and undulating with isolated high hills reaching up to 703 m above msl. The easterly flowing Palar River drains the plain. The river has wide alluvial cover on either sides. Kavundinya Nadi from the northwest and Agaram Ar from the south join the Palar River. Two major tributaries Kallparai Ar and Uttalum Ar join the Agaram Ar. The Vellore-Ambur section of National Highway No. 46 passes through the area. The Chennai-Bangalore railway line of the Southern Railway passes through the central part of the area.

Distinct and contrasting litho-assemblages are exposed on either side of Palar River. Charnockite and epidote-hornblende gneiss are the predominant rock types to the south of Palar. The rock assemblages in the north belong to the Migmatite Group. Thick and wide Quaternary alluvium along the Palar River separate these two assemblages.

The dominant rock units of the Migmatite Group are hornblende-biotite gneiss and migmatites with minor agmatic gneiss and pink granitoid gneiss. The texture varies from banded to contorted gneisses, homophonous and even porphyritic. These are traversed by polyphase injections of quartzo feldspathic veins. Mica-sillimanite-kyanite schist occurs as patches. Pink syenite occur as isolated small plugs.

Charnockite Group of rocks with interbanded sequence of pyroxene granulite and banded magnetite quartzite have undergone wide spread migmatisation giving raise to epidote-hornblende gneiss that show extensive shearing and abundant ultrapotasshic permeations. The litho contact between charnockite and migmatite group of rocks is sheared/tectonised as evidenced by intensive brecciation,

psuedo-tachylite venations and fracturing along the Palar River course. These migmatite gneisses are quarried and are extensively used as road metal and building material. The general trend of the gneissic foliation is NNE-SSW to NE-SW with moderate to steep dip on either side. At times the foliation swerve to NNW-SSE to NW-SE. Joints are well developed in NNE-SSW to NE-SW and NW-SE directions with steep dip on either side.

Three sets of dolerite dykes cut across the above litho units along NW-SE, NNE-SSW and WNW-ESE to EW directions in the central part of Vellore District.

The Palar River alluvium is restricted along the Palar River course and is composed of sand, silt and clay of varying proportion.

The eastern part of the Vellore District adjoining Thiruvallur and Kanchipuram Districts depicts a peneplanated country with isolated hillocks and mounds of dolerite dykes, charnockites etc. The Gondwana Super Group, which overlies non-confirmly over the Peninsular Gneissic Complex is represented by Sriperambadur and Satyavedu Formation is mainly argillaceous consisting of grey to white fossiliferous shales, with bands of sandstone and conglomerate.

Sand stone is fine to very coarse grained, light to greyish white in colour, compact, sub-arkosic with plenty of grey and white quartz. Multi storied sandstone show cycles of fining upward into silt and shale. Quartz gravel of quaternary age named as Conjeevaram gravel is seen overlying the Gondwana rocks at places. It is a semi consolidated rock formed by reworked quartz of the earlier sediments. Most often the gravels are highly lateritised.

B. MINERAL WEALTH

In Alangayam, NE of Elagiri hills, a number of quartz-barytes veins traversing the gneisses analysed significant Molybdenum values (0.1 to 0.5%) upto 1 m thickness. Detailed investigation by drilling, trenching was carried out in these areas. Sulphides in the form of pyrite, galena, molybdenite occur in quartz-barytes veins.

Carbonatites, SE of Sevattur (11°25'30";78°30'50") and around Koratti (11°25'15" ;78°33'25") have brought to light 35 to 40% CaO, 3.6 to 8% MgO, 4.25% P_2O_5, 100 to 1000 ppm of Ce, 80 ppm of La, 40 to 120 ppm of Nb and less than 500 ppm of Ta. Vermiculite and Barytes are worked locally by M/s.TAMIN Ltd. Near Sevvattur, Vermiculite occurs in the northern parts of a pyroxenite band traversed by carbonatite.

During the district mineral survey many working and non-working quarries has been inspected along with Deputy Director and Additonal Director, DGM, Vellore in association with the RI and other field staffs. The details of the inspections are enlisted below.

Vermiculite:

In Vellore District, the State Department of Geology, Government of Tamil Nadu investigated a vermiculite deposit near Elavampatti. The mineral, which occurs as pods and lenses shows an exfoliation index upto 15 times the original volume when heated to 850°C. A total reserve of 1.93 lakh tonnes has been estimated upto a depth of 9 m. Near Sevattur, vermiculite occurs in the northern part of a pyroxenite band, traversed by carbonatite. The State Department of Geology, Government of Tamil Nadu, estimated a reserve of 1,32,086 tonnes of vermiculite upto a depth of 9 metre in 162.6 hectares area.



Figure 25: View of active mining in TAMIN Vermiculite mines at Sevathur



Figure 26. TAMIN Vermiculite mines at Sevathur with practice of benching

Table 44. Inventory of District Mineral Resources (Industrial Minerals) Commodity: Vermiculite

S.No	Village/ Taluk/ District	Lat / Long	T.S No	Name of the block	Area sq. km	Type of deposit	Strike length / width	Depth of resource estimated	Resource in MT and stage of exploration	Grade / assay value	Status of land (lease hold/ free hold)
1.	Sevathur Elavampatti	12°25'12.14"N 78°31'34.14"E	57 L/7 & 11	Kandili	23-71-0 Hectares (or)	Vein type	N.A	9 m	**Refer Table below**		Lease by TAMIN

Table 45. Details of Vermiculite Mining in TAMIN Quarry at Sevathur, Kandili Block, Vellore District

S.No.	Details	Reserves Quantity (in Tonnes)	Recovery Quantity @ 9% (in Tonnes)	UNFC Class
A) Updated Geological Reserves as on 30.06.2014 (TAMIN Mines, Sevathur)				
1.	a) Proved Reserves	14,01,630	1,26,147	**111**
	b) Probable Reserves	2,20,806	19,873	**121**
	Total updated Proved Reserves	**16,22,436**	**1,46,020**	-
B) Remaining Resources				
2.	a) Mineral locked up in benches	43,443	3,910	**221**
	b) Mineral locked up in 7.5 m safety barrier	1,51,560	13,640	
	Total Resources	**1,95,000**	**17,550**	

The average proposed rate of production of Vermiculite around 33,500 tonnes per year by considering the updated proved reserves (11 1 Category) is 14,01,630 tonnes and the life of the mine would be around 42 years.

Molybdenum:

The Alangayam area falls in the northeastern part of the Gudiyattam Bhavani Belt and mainly consists of epidote - hornblende gneiss occupying the valley between the Elagiri Hills in the west and the Javadi Hill range in the east. A number of quartz - baryte vein bearing pyrite, galena and molybdenite and occasion al chalcopyrite are emplaced within epidote - hornblende gneiss. Detailed prospecting including scout drilling by GSI, has revealed a number of low dipping parallel quartz veins, some of which assayed significant molybdenum values (0.01% to 0.51%). The maximum thickness of the mineralised zone is one metre. A probable reserve of 86,314 tonnes and possible reserve of 6,33,408 tonnes with the average ranging from 0.0125 to 0.04% of Mo has been estimated.

Barytes:

Barytes occur as s associated with quartz veins near Alangayam, Vellore District. The veins are irregular and the cost of winning is considered of barites costly because of the intimate association with quartz.

Minor occurance of Silliminatite and Steatite in Walajah Taluk of Vellore District.

Construction Material (including Dimension Stones)

Greater part of Tamil Nadu is occupied by hard crystalline rocks. These as well as some of the clays are used as construction materials for various purposes. The hard rocks are normally used as dressed stones, ballast and jelly in various parts of the state. In recent times stone crushing units have come up on large scale, catering to the high demand for road metal and railway ballast requirements.

Developmental activities in respect of dimension stone deposits such as exploration, exploitation, processing and export is so advanced in Tamil Nadu, it merits distinct entity and narration. Practically every major lithotype of the Precambrian shield is formed a dimension stone variety, finding extensive use in building the industry.

The transition zone from amphibolite facies metamorphism in the north to granulite facies in the south in the western periphery of Vellore District and in Krishnagiri District is marked by an uniquely designed, pink granite-gneiss which has become the world famous PARADISO.

Younger intrusive granite with weak to moderate foliation and colour range from grey/yellow to pink forms dimension stone deposit such as RAW SILK, VANJI PINK, GREY PEARL, MOON STONE, TOMATO/CHILLI RED, etc., in localities, Tiruttani, Tiruvallur District and adjoining Sholingur in Vellore District.

In addition to prolific occurrence of multi coloured granite deposits, Tamil Nadu is also endowed with high and medium quality ***black granite*** deposits. Some of the black granites are being quarried by TAMIN and other private enterprises in the area surrounding Sholingar and other parts of the district. Of these, the Kunnam

(KNM) BLACK is equivalent to the JET BLACK or ABSOLUTE BLACK of Sweden wherein the inherent characteristics such as densely clouded plagioclase feldspar, unaltered pyroxene (augite and pigeonite) and appreciable incidence of opaque accessories have all contributed to the absolute blackness of the material which attains glossiness and reflectivity of very high order on polishing.



Figure 27: Fox Brown/ Chikoo Brown (Colour Granite) Quarry of M/s. G.Achutan at Athanavoor Village in Yelagiri Hills, Tirupathur Taluk *(Refer Table 6, S.no.1, Page no.8)*



Figure 28: Active Mining at M/s. G.Achutan at Athanavoor Village in Yelagiri Hills, Tirupathur Taluk *(Refer Table 6, S.no.1, Page no.8)*



Figure 29: Dead carcass of a Python (photo taken on 5.7.2017) near M/s. Achuthan and Subash Colour Granite Quarry at Athanavoor, Elagiri Hills indicating deterioration of wildlife
(Refer Table 6, S.no.1&4, Page no.8)



Figure 30: Black Granite Quarry (not working) by TAMIN at Kodakkal near Sholingur
(Refer Table 5, S.no.4,6,7, Page no.7&8)



Figure 31: Black Granite Quarry (not working) by TAMIN at Mahimandalam
(Refer Table 5, S.no.1, Page no.6)



Figure 32: Black Granite Quarry (not working) by TAMIN at Rendadi *(Refer Table 5, S.no.3, Page no.6)*



Figure 33: Black Granite Quarry (working) by M/s.Raymond Ruban at Vinnamangalam , Vaniyambadi Taluk *(Refer Table 6, S.no.2, Page no.8)*



Figure 34: Quartz Quarry (abandoned) - M/s.Saravanan Marimanikuppam , Vaniyambadi Taluk
(Refer Table 7, S.no.1, Page no.9)



Figure 35: Stone Quarry (working) 12°43'52.37"N; 78°41'52.10"E - M/s,A.B.Aiyyappan, Vinnamangalam, Ambur Taluk

(Refer Table 23, S.no.3, Page no.31)



Figure 36: Stone Quarry (working) 12°43'34.57"N; 78°41'47.53"E- M/s,D.Gunalan, Vinnamangalam, Ambur Taluk

(Refer Table 23, S.no.6, Page no.32)



Figure 37: Stone Quarry (working) 12°43'30.43"N; 78°41'39.68"E - M/s,Karthick, Vinnamangalam, Ambur Taluk

(Refer Table 23, S.no.9, Page no.32)



Figure 38: Stone Quarry (working in spite of no EC clearance) 12°43'24.61"N; 78°41'32.89"E- M/s,R.Mani, Vinnamangalam, Ambur Taluk - Active

(Refer Table 23, S.no.5, Page no.31)



Figure 39: Stone Quarry (working) 12°56'17.74"N; 79°12'16.13"E- M/s,Radhakrishnan, Perumugai, Vellore Taluk

(Refer Table 8, S.no.8, Page no.11)



Figure 40: Stone Quarry (working) 12°56'13.81"N; 79°11'55.54"E- M/s,D.Parimala, Perumugai, Vellore Taluk

(Refer Table 8, S.no.1, Page no.11)



Figure 41: Stone Quarry (working) 13° 8'50.87"N; 79°35'52.13"E- M/s,J. Suresh Kumar, Kizhavanam, Arakkonam Taluk

(Refer Table 18, S.no.4, Page no.26)



Figure 42: Stone Quarry (working) 13° 2'39.41"N; 79°43'14.21"E- M/s,R.B.Raja, Thakkolam, Arakkonam Taluk

(Refer Table 19, S.no.1, Page no.27)

C. RIVER SAND

Sand is composed of consolidated felsic compound Silica and Feldspar and are formed by the action of water due to transportation and erosion of rocks. There are different sources of sand and gravel, the most important among them is the river. As the requirement of construction materials is on rise, they also are very vital for the health, physical character of the river and the different important functions of the river. The extraction of sand and gravel from the river bodies has to be regulated and done with adoption of required environmental safeguards.

For making available these resources, a mapping of these resources at the district level, identification of appropriate sites for extraction, appraisal of the extraction process, putting in place the required environmental safeguards, and rigorous monitoring of the volume of extracted material is required to ensure sustainability of the entire process.

i. Sand Mining in Tamil Nadu

In Tamil Nadu the Sand mining is being carried out as per the Minor Mineral rules /Mineral Concession Rules, 1959 and the state has introduced rule 38-A in the concession rules vide G.O.Ms. No. 95 dated 1st October 2003. The responsibility of the minor mineral "sand" is handled by the Department of Geology & Mining, Tamil Nadu. The PWD is responsible for identification of sand bearing areas in the river stretches and they send a proposal to the District Collector for seeking quarrying permission. The collector conducts a joint inspection of the proposed area and on recommendation of the Joint Inspection Team instructs the PWD to prepare the mine plan. PWD has the responsibility to prepare the mine plan and the get the environment clearance from the relevant body depending upon the size of the area. After getting the mine plan approved and the environmental clearance, the district collector grants the permission to PWD for sand quarrying on nomination basis. There is no restriction on the size of the concessions and the time period for extraction is up to 3 years. PWD calls for tenders for selection of contracts from private parties for extraction and loading of sand. All the existing quarries are having an area less than 25 Ha and currently only 12 quarries are functioning after the high court ban. Even though in-stream sand mining is not allowed in the state, illegal sand quarried thrive. Private persons are allowed to establish stockyards to store sand purchased from PWD.

ii. Sand Mining in Vellore District

The Vellore District is blessed with huge sand resources, as the district is carved out incorporating the maximum length of the River Palar, which hosts the vast flood

plains with potential source of river sand. In addition to Palar River, few other triburaties also contribute for River sand, but they are either coarser/gravelly or the sand resource is poor due to admixture of silt and clay minerals in it.

In Vellore district the main source of sand is from in-stream mining. In-stream sand mining is a common practice because the mining locations are usually along the transportation routes. Excessive removal of sand may significantly distort the natural equilibrium of a stream channel. By removing sediment from the active channel bed, in-stream mines interrupt the continuity of sediment transport through the river system, disrupting the sediment mass balance in the river downstream and inducing channel adjustments (usually incision) extending considerable distances (commonly 1 km or more) beyond the extraction site itself.

One such example of in-stream sand mining in Palar River is dealt in Page no.41 of this report indicating the rampant sand mining near Sathampakkam and Sakkaramallur (Fig 2 & 3), similarly, active mining is being carried out at Kothamagalam and Pogai area with a cumulative area of about 19 Ha.

In addition to this, 4 new areas has been proposed for sand mining by PWD, viz., Arumparuthi, Navlok, Pattu and Pasumathur-2, with an area of 20.00.0, 7.20.0, 5.76.0 and 15.00.0 Hectares. During the field visits, some of these sites were inspected and the details are given below along with the evidence of sans mining over the years from multi-temporal high resolution Digital Globe satellite image accessed through Google Earth for various dates available open source (Fig. 44 to 47).

The area around the proposed sand quarry near Pattu has been inspected and found that the middle of the river bed has a stabilized sand bar in the lease area, with active cultivation. (Fig.43 and 47)



Figure 43: View of proposed sand quarry at Pattu
(Refer Table 28, S.no.3, Page no.37)

Whereas, at the proposed quarry at Arumparuthi, the Fig. 44 indicates a trapezium shaped lease hold area extending into the older flood plain in the right bank of the palar, where active plantation is observed in the satellite image.

While, in the lease area of Pasumathur-2 shown in Fig. 46 indicates active mining in the same area from 2011 to 2017, whereas the image of 2009 shows a pristine picture without mining activity. Due to active mining of sand over the years in Pasumathur area, the river bed level has drastically gone down and resembling a set of artificial lakes. Further mining of sand in these area is only possible if there is replenishment in sand from previous monsoon water flow derived from upstream of this area. Moreover, constant mining in the same area will deteriorate the ecosystem of the riverine environment.

In Navlock area, the proposed sand mining site is comparatively less disturbed than the other proposed site, however from Fig. 45 it is evident that active sand mining is from the left bank of river bed.



Figure 43a: Proscribed Sand mining evident from satellite image dated 20.12.2017 near the Sathampakkam Sand quarry *(Refer Table 26, S.no.1, Page no.35 & Fig.2&3 Page no.41)*

Besides regular sand mining in the demarcated area, sand mining is active in certain fringe areas, where prohibited areas are being exploited including the patta land cheating the administration/revenue officials. Even after strict vigil by the District Revenue and Administration, some illegal mining thrives which are evident from the satellite images as referred in Fig.43a.

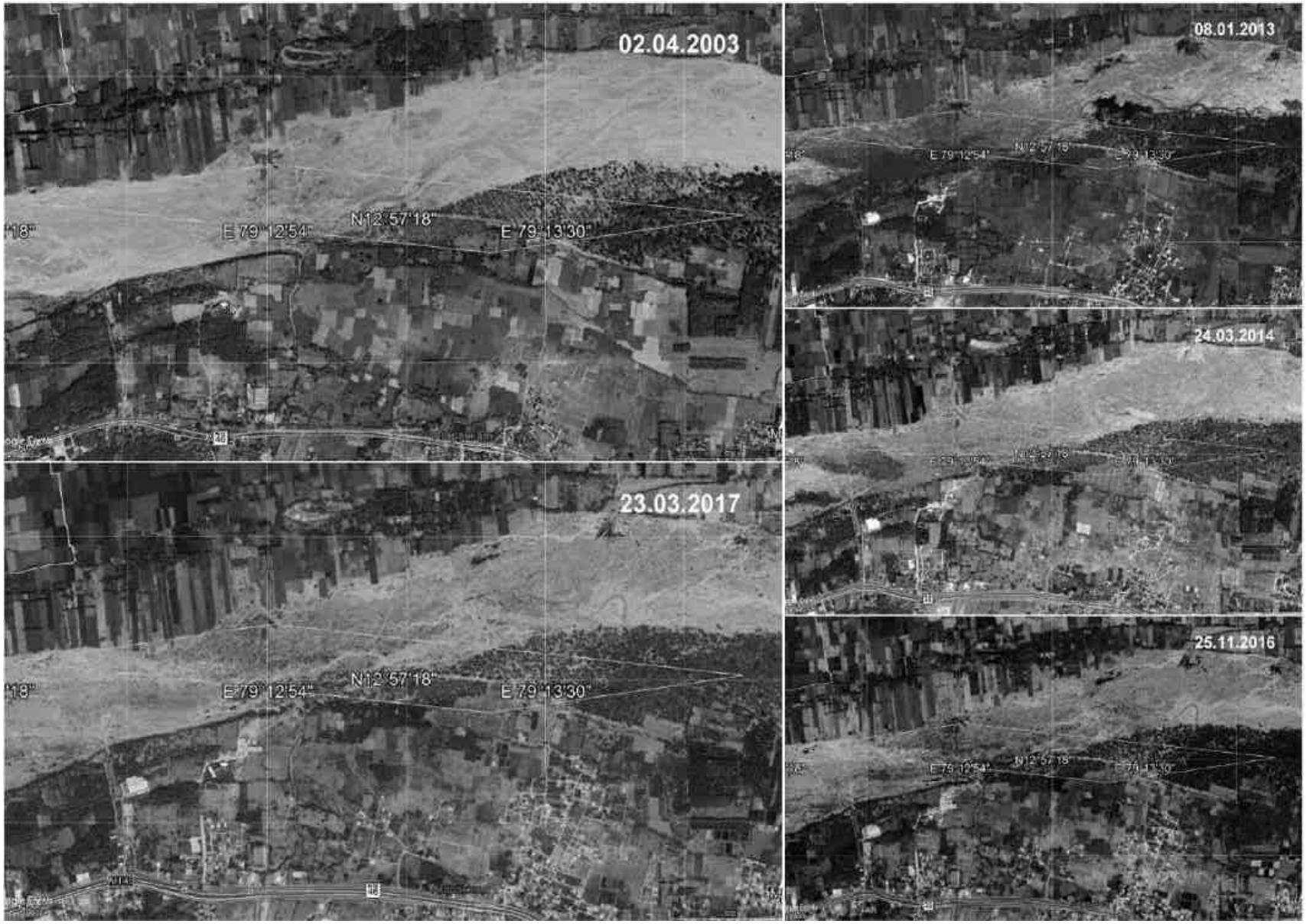


Figure 44. Multitemporal Satellite Image of the area covering proposed sand quarry at ARUMPARUTHI area (yellow polygon indicates the bounding area prepared from the data provided by PWD)

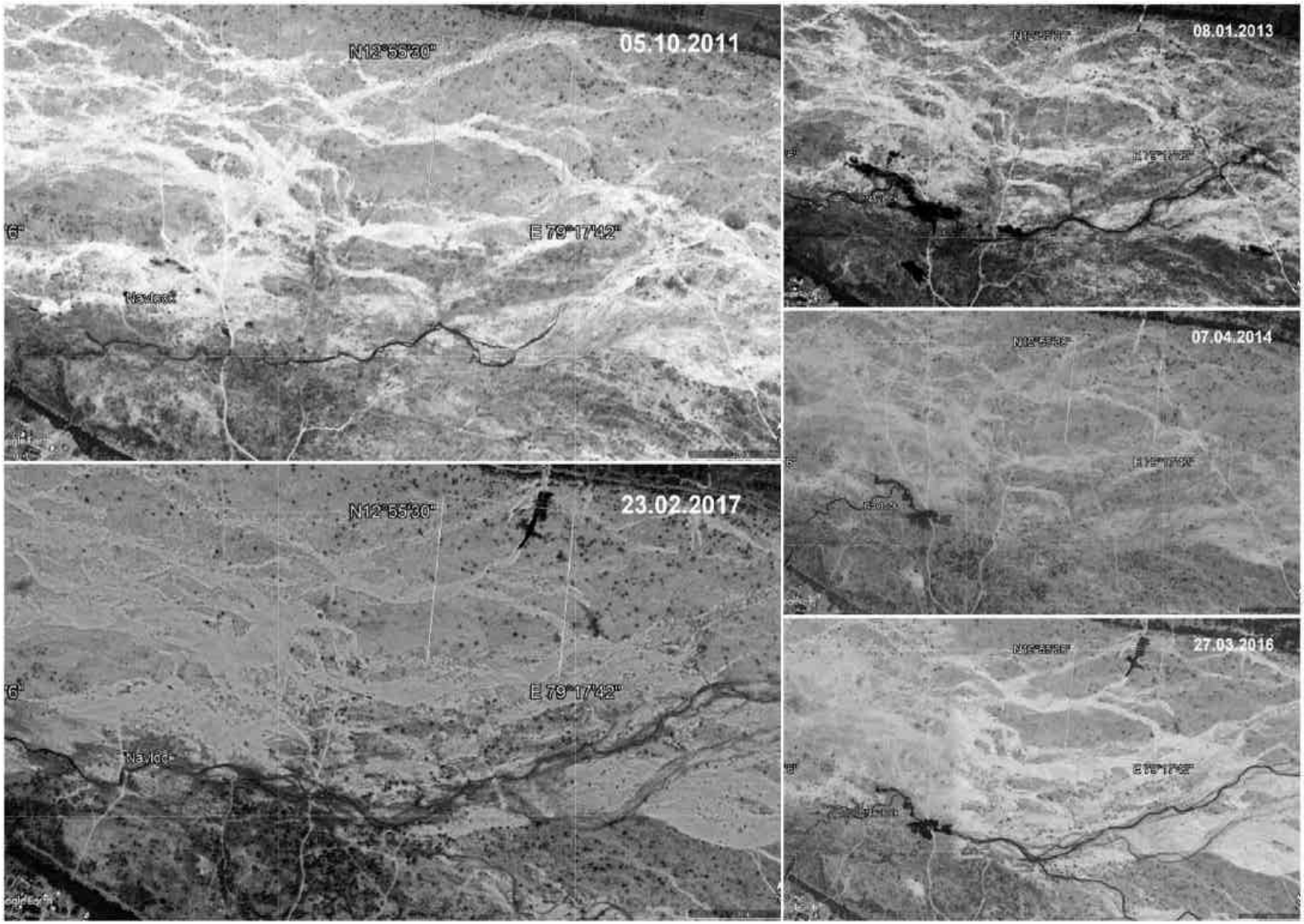


Figure 45. Multitemporal Satellite Image of the area covering proposed sand quarry at NAVLOCK area (yellow polygon indicates the bounding area prepared from the data provided by PWD)

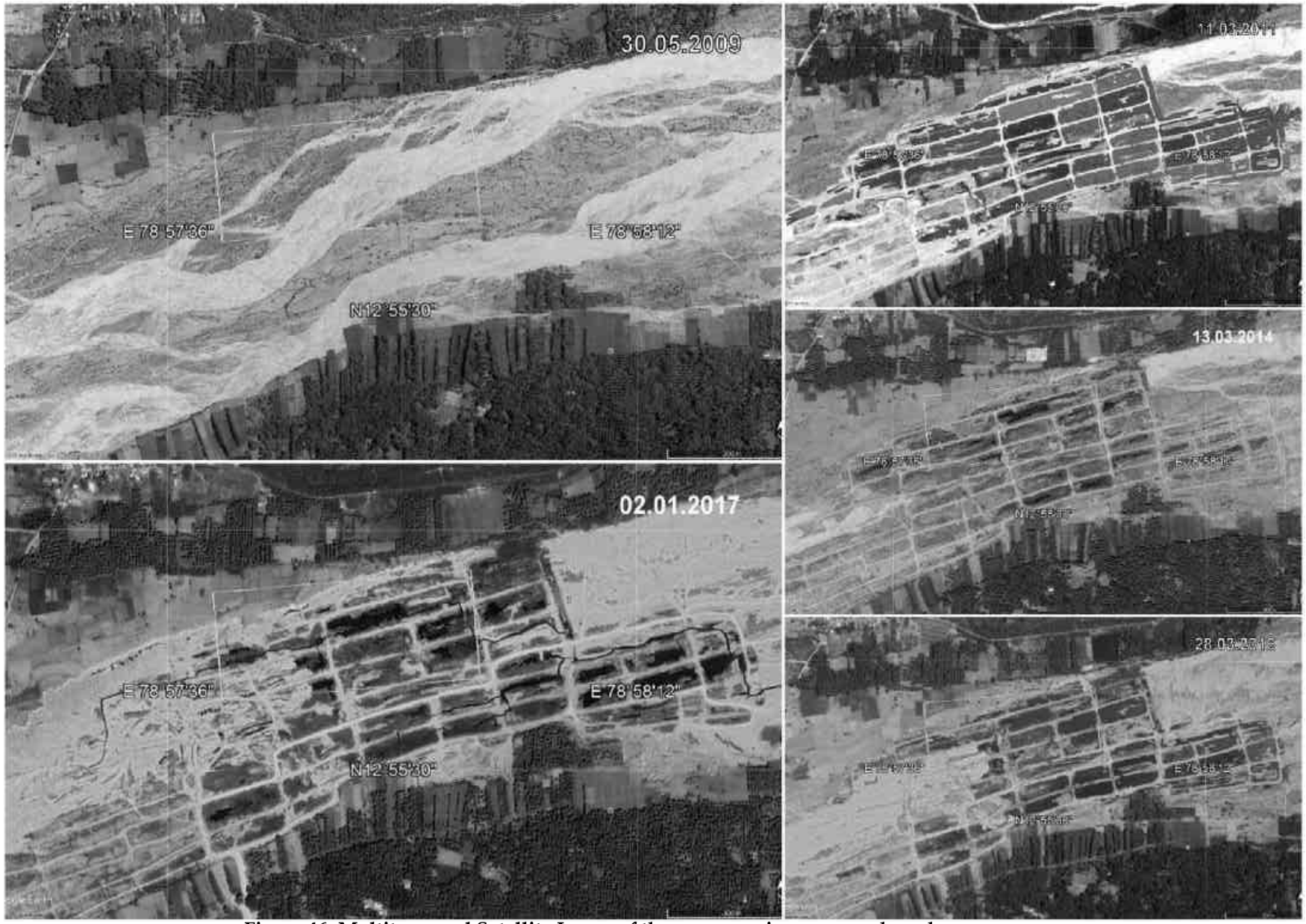


Figure 46. Multitemporal Satellite Image of the area covering proposed sand quarry at PASUMATHUR-2 area (yellow polygon indicates the bounding area prepared from the data provided by PWD)

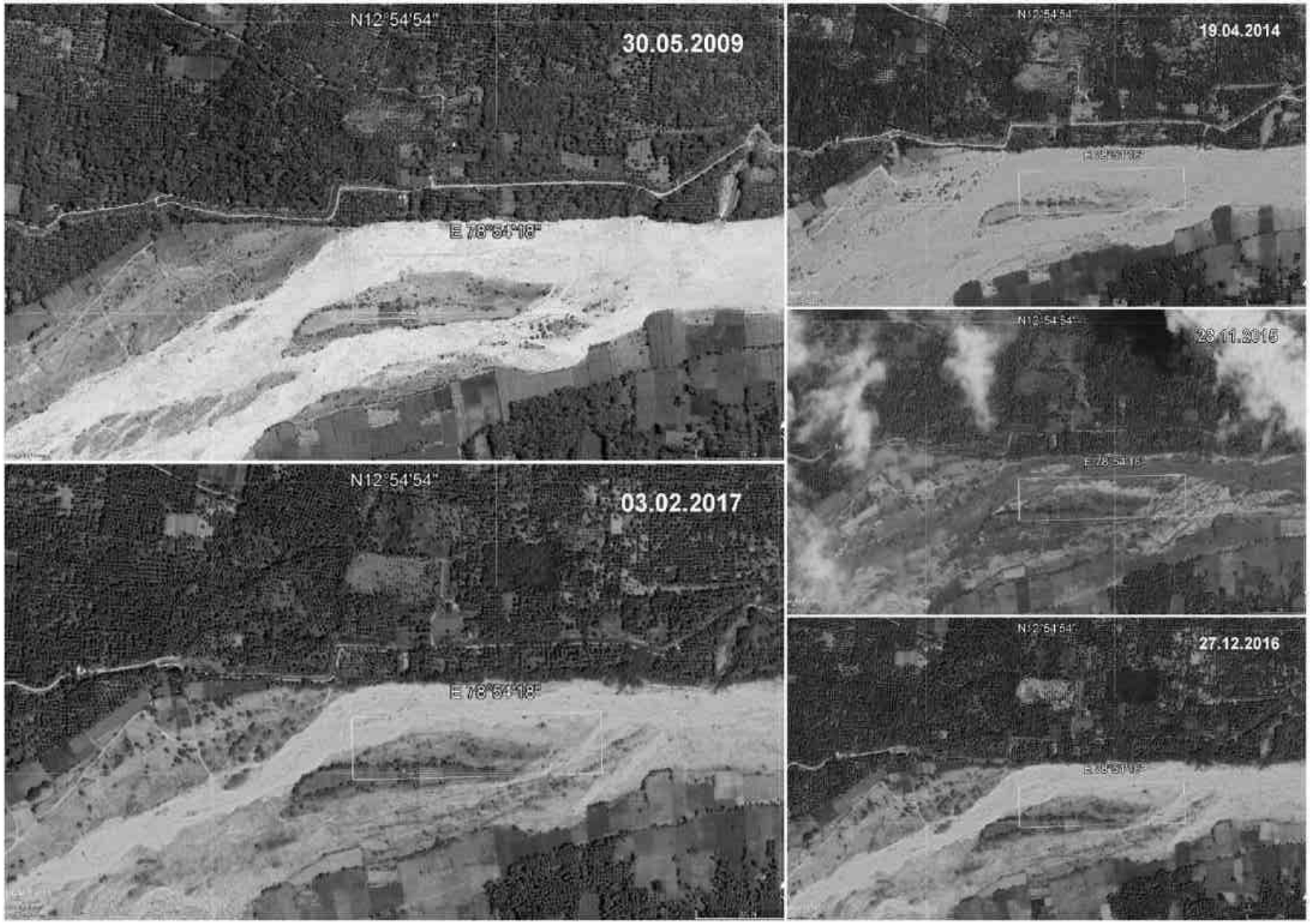


Figure 47. Multitemporal Satellite Image of the area covering proposed sand quarry at PATTU area (yellow polygon indicates the bounding area prepared from the data provided by PWD)

XII. SUMMARY & RECOMMENDATIONS

This District Survey Report has been prepared by carrying out rapid assessment with limited field inspections without any in depth study for only few days. The details related to the occurrence of mineral resources and other data of the district are subject to updation from time to time.

Before granting of any quarrying lease, parameters related to geosciences and sustainable developments are to be considered.

A. DIMENSIONAL STONE AND ROUGH STONE QUARRIES

- In most of the dimensional stone quarries like colour granites and black granite, the recovery is reportedly poor due to colour and textural variation, cracks and joints, mafic inclusion etc., since most of the ML were obtained without carrying out proper geological investigation that leads to poor recovery and heavy loss.
- It may be advised to the entrepreneurs to carry out detailed resource estimation by an authentic agency or shall be made as a consultancy with GSI for before granting for ML in each case.
- The safety measures and the mining regulations were not followed strictly in most of the quarries/ mines, like provision of fencing, name board, sign board, ML corner pillars, water sprinklers, maintenance of green belt, etc. These are required to be strictly enforced.
- The rough stone quarries operating in various part of district poses environmental concerns in form of air pollution as the fine dusts migrate far distances.
- Water sprinkling should carried out periodically during mining activities to avoid air pollution in nearby villages/towns
- Regarding the depth of quarrying for rough stones/ jelly, no specific depth has been prescribed. Studying the average groundwater level of a particular area, the mining depth may be prescribed at least more than 2 to 5 m above groundwater level.
- Water seepage and stagnation of water in the quarry site is observed in most of the quarries, especially in the area of depleted parts of the quarry. Sometimes, cattles and even small kids tend to slip since these quarries operate in the near vicinity of the villages.
- It is recommended to protect these stagnant water bodies in the quarry sites with suitable permanent fencing in order to keep the cattles away from the site.

- Heaps of mine waste has been found dumped around the mine / quarry sites that modifies the landform of the area and unnecessarily occupying the open land.
- These mine waste may be utilized (mostly the charnockites and black granite) for the production of other products like aggregates (jelly stones), M-sand and dust material, etc.
- Levelling of ground in the mined area after mining activity has finished, with dump and development of plantation/afforestation should be done by the concerned leasee to make the balanced environment
- These rough stone quarries some time extend their mining activities even after lease period in some cases and some quarries is active without EC clearance.
- These sort of illicit mining activities should be strictly monitored by District Revenue and Administration, for which a separate task force may be formed to avoid revenue loss and environmental degradation.
- Introduction of e-permit system and implementation of Mineral Dealers Rule and the dispatch slips/transit permits with tampered proof security features and tracking of mined out minerals will fetch more revenue to the State Exchequer as well as sustainable development.
- All the database of the Mines, quarries including the permits are recommended to be maintained as a spatial geodatabase by establishing a seperate Geoinformatics/GIS wing within in Department of Geology and Mines at each district headquarters. This will enable effective monitoring and helps the decision makers for effective planning and execution.

B. SAND MINING

Sand mining in India has reached to a level threatening the environment and ecosystem. Hence sustainable mining is extremely important for the country. Sustainable sand mining is a fundamental concept that promotes environmental protection, limiting negative physiological, hydrological and social impacts underpinning sustainable economic growth.

For sustainable sand mining, the following geomorphological parameters should strictly be followed if sand mining is unavoidable or warranted.

To ensure that sand mining is done in environmentally sustainable and socially responsible manner, and ensuring the conservation of the river equilibrium and its natural environment by protection and restoration of the ecological system

- Inactive flood plains, terrace at higher level are preferable.
- Active river beds/streams are to be avoided, ensuring no obstruction to the river flow and restoring the riparian rights and in-stream habitats
- Course of the river should not be changed.
- Mining activity should not go beyond the depth of water table of the areas.
    - Large rivers are preferred than small streams.

- Mining at the concave side of the river channel should be avoided to prevent bank erosion. Similarly meandering segment of a river should be selected for mining in such a way as to avoid natural eroding banks and to promote mining on naturally aggrading meander parts.
- Prolonged riverbed material mining in a given place of the river will induce seasonal scouring and intensify the erosion activity within the channel. This will have effect not only within the mining area but also both in upstream and downstream of the river course. Hence, effects of such scouring and enhanced erosion due to riverbed mining should be evaluated periodically and avoided for sustainable mining activities.
- Maintain river equilibrium with the application of sediment transport principles in determining the locations, period and quantity to be extracted.

C. GUIDELINES AND METHODOLOGY

The Sustainable sand mining guidelines as per SEIAA Proceeding dated 7.05.13 and MoEF & CC Guidelines, 2016 have to be followed for delineation of new sand ghats :-

- Should be at a distance of 10 Km from forest Sanctuary
- At a distance of 250m from the Reserve / Protected Forest
- At a distance of 10km from Interstate boundary
- At a distance of 500m from habitation, reservoir, archaeological monuments
- 15m distance from river bank or 1/5th of the total width of the river whichever is more
- For contiguous area, certification and availability of sand in less than 05 Hectare area.
- High Tension (33kb) transmission line not to pass above the sand ghats.
- The maximum mineable depth not to exceed 03m from river bed for quantification of sand.
- Natural building meanders to be preferred.

D. REPLENISHMENT STUDY FOR SAND

Replenishment study has not been carried out so far as requested in the *MoEFCC Gazette Notification No.S.O.141(E) dated 15.01.2016.* Therefore, replenishment study should carried out across the state in all districts as per the method prescribed in the *Sustainable Sand Mining Guidelines 2016 of MoEFCC*. Some of the points that should be taken care of while conducting replenishment study are:

- The cross-section survey should cover a minimum distance of 1.0 km upstream and 1.0 km downstream of the potential reach for extraction.
- The sediment sampling should include the bed material and bed material

load before, during and after extraction period.

- Development of sediment rating curve at the upstream end of the potential reach using the surveyed cross- section.
- Using the historical or gauged flow rating curve, determination of suitable period of high flow that can replenish the extracted volume.
- Calculation of the extraction volume based on the sediment rating curve and high flow period after determining the allowable mining depth.

Other than the details discussed in the report, the other information required for DSR on other parameters related to the following details on drainage system are not available due to time constraint. Viz., Area of drainage its percentage, Portion of the River or Stream recommended for Mineral Concession, Length of area recommended for mineral concession (in kilometre), Average width of area recommended for mineral concession (in meters), Area recommended for mineral concession (in square meter), Mineable mineral potential (in metric tonne) (60% of total mineral potential), etc.

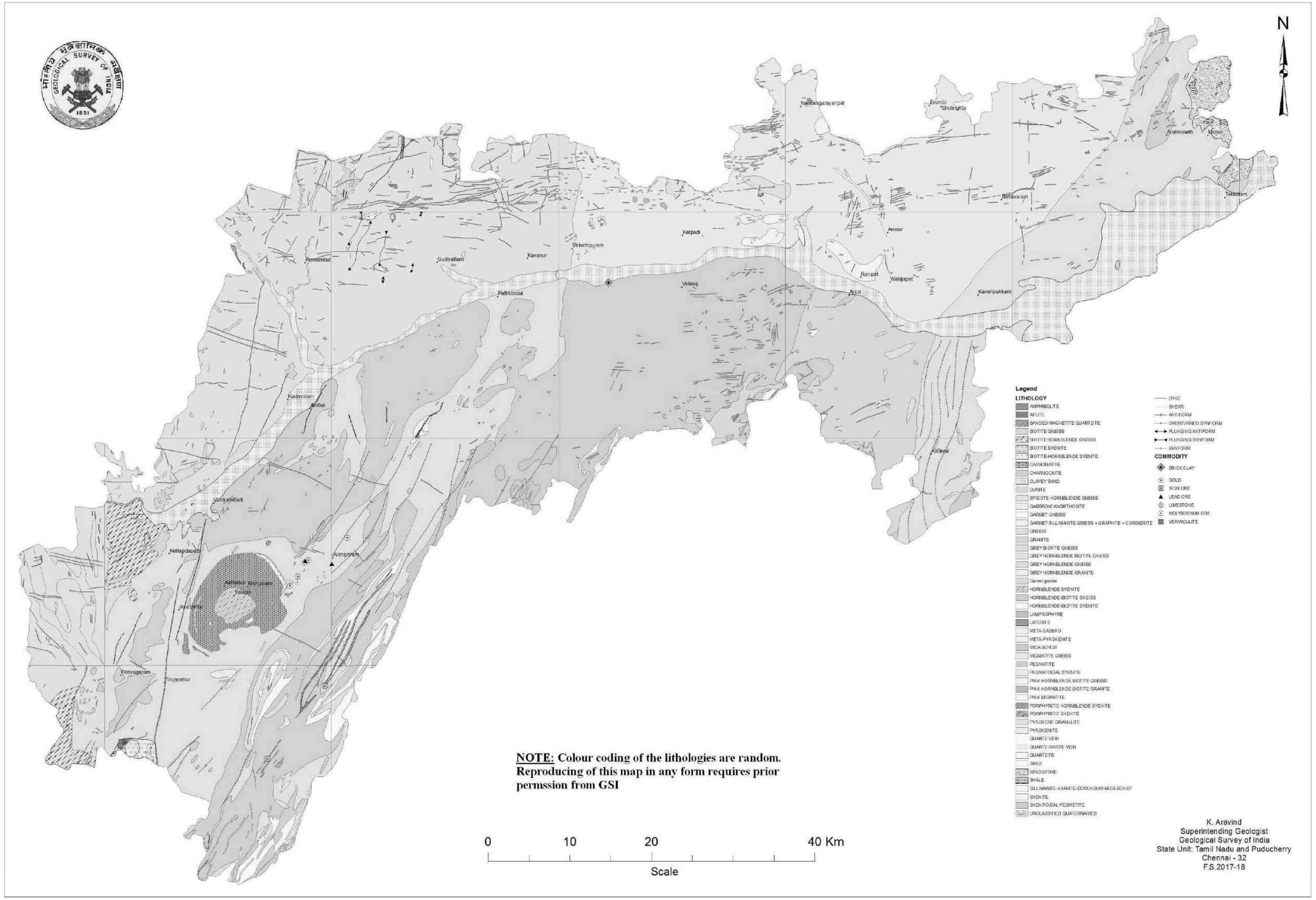
XIII. SCOPE AND CONSTRAINTS

As the DSR is prepared with limited field checks in short span of time with help of GSI, most of the information in this report would require further detailed investigation with all the parameters required by the *MoEFCC Gazette Notification No.S.O.141(E) dated 15.01.2016 and S.O.190(E) dated 20.01.2016.* Including the replenishment study on Annual Deposition rates of sand from a river and deposition stretch of the rivers

The constraint for not doing so is due to lack of manpower to conduct the study, as the study was entrusted to GSI only for providing details of geology with limited field traverses and to compile the available information. We are proposing the design of team that can do the job and how to find those

Sd// S.A.Raman I.A.S (01.08.2018)
District Collector
Vellore

GEOLOGICAL MAP OF VELLORE DISTRICT



K. Aravind
Superintending Geologist
Geological Survey of India
State Unit: Tamil Nadu and Puducherry
Chennai - 32
F.S.2017-18

ANNEXURE-8

Shrient Analytical and Research Labs Pvt. Ltd.

416/15, Dharga Road, Perungalathur, West Tambaram, Chennai- 600045.
Phone No: 9841074398 / 9698141777 E-mail : Info@shrientanalytical.com
Website : www.shrientanalytical.com

TEST REPORT

Report No.	SARL/23-091

Report Date.	02.12.2023

Customer Name & Address	Project Name: Thiru R. Natarajan - TOR File No 9971 The proposed quarry of Thiru.R.Natarajan survey nos. 253/7, 259/5, 259/2 and 259/4 over an extent of 2.31.50 Ha, Karadikudi Village, Anaicut Taluk, Vellore District, Tamil Nadu.
Sample Description	AMBIENT AIR QUALITY
Sampling Procedure	IS – 5182 (Part – 14: 2000 & Part – V: Reaffirmed - 2003), CPCB Guide lines

Sample Location	A4-KARADIKUDI
Positioned height of Sampler	1.5 M above Ground Level

Customer Reference	As per work order	Sampling Procedure	24 hrs
Sample Reference No	SARL/A/CHE-091	Sample Received on	27.11.2023
Sample Collected by	LABORATORY	Test Commenced on	27.11.2023
Sample Collected Date	23.11.2023	Test Completed on	02.12.2023
Temperature	29°C	Relative Humidity	69%
Sample Condition	Fit for Analysis		

S. No.	Parameters	Protocol	Unit	Results	*Limits
1	Particulate Matter less than 10 micron size (PM_{10})	IS:5182: Part 23:2006	$\mu g/m^3$	44.6	100
2	Particulate Matter less than 2.5 micron size ($PM_{2.5}$)	IS 5182 (Part 24):2019	$\mu g/m^3$	21.7	60
3	Sulphur Dioxide (SO_2)	IS:5182: Part 02:2001	$\mu g/m^3$	4.6	80
4	Nitrogen Dioxide (NO_2)	IS:5182: Part 06:2006	$\mu g/m^3$	8.6	80
5	Carbon Monoxide (CO)	SARL/IOP/013 (Issue No:01, Issue Date – 01.03.2023)	mg/m^3	BDL (D.L – 1.1)	02

Remarks: Limits: *National Ambient air quality standards from CPCB. BDL- Below detectable limit. DL –Detectable limit.

For Shrient Analytical and Research Labs Pvt. Ltd

Verified 02/12/23

02/12/23

Authorized Signatory

J. GNANAPRAKASAM
Technical Manager

END OF THE REPORT

Please Contact:
For any Technical Issues & Complaints: vimalnath@shrientanalytical.com

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TEST REPORT

Report No.	SARL/23-092

Report Date.	02.12.2023

Customer Name & Address	Project Name: Thiru R. Natarajan - TOR File No 9971 The proposed quarry of Thiru.R.Natarajan survey nos. 253/7, 259/5, 259/2 and 259/4 over an extent of 2.31.50 Ha, Karadikudi Village, Anaicut Taluk, Vellore District, Tamil Nadu.
Sample Description	AMBIENT AIR QUALITY
Sampling Procedure	IS – 5182 (Part – 14: 2000 & Part – V: Reaffirmed - 2003), CPCB Guide lines

Sample Location	A3-PICHANATHAM
Positioned height of Sampler	1.5 M above Ground Level

Customer Reference	As per work order	Sampling Procedure	24 hrs
Sample Reference No	SARL/A/CHE-092	Sample Received on	27.11.2023
Sample Collected by	LABORATORY	Test Commenced on	27.11.2023
Sample Collected Date	24.11.2023	Test Completed on	02.12.2023
Temperature	30°C	Relative Humidity	59%
Sample Condition	Fit for Analysis		

S. No.	Parameters	Protocol	Unit	Results	*Limits
1	Particulate Matter less than 10 micron size (PM_{10})	IS:5182: Part 23:2006	$\mu g/m^3$	50.1	100
2	Particulate Matter less than 2.5 micron size ($PM_{2.5}$)	IS 5182 (Part 24):2019	$\mu g/m^3$	24.6	60
3	Sulphur Dioxide (SO_2)	IS:5182: Part 02:2001	$\mu g/m^3$	4.4	80
4	Nitrogen Dioxide (NO_2)	IS:5182: Part 06:2006	$\mu g/m^3$	8.4	80
5	Carbon Monoxide (CO)	SARL/IOP/013 (Issue No:01, Issue Date – 01.03.2023)	mg/m^3	BDL (D.L – 1.1)	02

Remarks: Limits: *National Ambient air quality standards from CPCB. BDL- Below detectable limit. DL –Detectable limit.

For Shrient Analytical and Research Labs Pvt. Ltd

Verified 02/12/23

Authorized Signatory 2/12/23

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J. GNANAPRAKASAM
Technical Manager

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TEST REPORT

Report No.	SARL/23-093

Report Date.	02.12.2023

Customer Name & Address	Project Name: Thiru R. Natarajan - TOR File No 9971 The proposed quarry of Thiru.R.Natarajan survey nos. 253/7, 259/5, 259/2 and 259/4 over an extent of 2.31.50 Ha, Karadikudi Village, Anaicut Taluk, Vellore District, Tamil Nadu.
Sample Description	AMBIENT AIR QUALITY
Sampling Procedure	IS – 5182 (Part – 14: 2000 & Part – V: Reaffirmed - 2003), CPCB Guide lines

Sample Location	A4-KARADIKUDI
Positioned height of Sampler	1.5 M above Ground Level

Customer Reference	As per work order	Sampling Procedure	24 hrs
Sample Reference No	SARL/A/CHE-093	Sample Received on	27.11.2023
Sample Collected by	LABORATORY	Test Commenced on	27.11.2023
Sample Collected Date	24.11.2023	Test Completed on	02.12.2023
Temperature	30°C	Relative Humidity	59%
Sample Condition	Fit for Analysis		

S. No.	Parameters	Protocol	Unit	Results	*Limits
1	Particulate Matter less than 10 micron size (PM_{10})	IS:5182: Part 23:2006	$\mu g/m^3$	46.2	100
2	Particulate Matter less than 2.5 micron size ($PM_{2.5}$)	IS 5182 (Part 24):2019	$\mu g/m^3$	23.1	60
3	Sulphur Dioxide (SO_2)	IS:5182: Part 02:2001	$\mu g/m^3$	5.7	80
4	Nitrogen Dioxide (NO_2)	IS:5182: Part 06:2006	$\mu g/m^3$	9.7	80
5	Carbon Monoxide (CO)	SARL/IOP/013 (Issue No:01, Issue Date – 01.03.2023)	mg/m^3	BDL (D.L – 1.1)	02

Remarks: Limits: *National Ambient air quality standards from CPCB. BDL- Below detectable limit. DL –Detectable limit.

For Shrient Analytical and Research Labs Pvt. Ltd

Verified 02/12/23

Authorized Signatory 02/12/23

J. GNANAPRAKASAM
Technical Manager

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TEST REPORT

Report No.	SARL/23-094

Report Date.	02.12.2023

Customer Name & Address	Project Name: Thiru R. Natarajan - TOR File No 9971 The proposed quarry of Thiru.R.Natarajan survey nos. 253/7, 259/5, 259/2 and 259/4 over an extent of 2.31.50 Ha, Karadikudi Village, Anaicut Taluk, Vellore District, Tamil Nadu.
Sample Description	AMBIENT AIR QUALITY
Sampling Procedure	IS – 5182 (Part – 14: 2000 & Part – V: Reaffirmed - 2003), CPCB Guide lines

Sample Location	A5-ODIYATHUR
Positioned height of Sampler	1.5 M above Ground Level

Customer Reference	As per work order	Sampling Procedure	24 hrs
Sample Reference No	SARL/A/CHE-094	Sample Received on	27.11.2023
Sample Collected by	LABORATORY	Test Commenced on	27.11.2023
Sample Collected Date	25.11.2023	Test Completed on	02.12.2023
Temperature	29°C	Relative Humidity	70%
Sample Condition	Fit for Analysis		

S. No.	Parameters	Protocol	Unit	Results	*Limits
1	Particulate Matter less than 10 micron size (PM_{10})	IS:5182: Part 23:2006	$\mu g/m^3$	45.8	100
2	Particulate Matter less than 2.5 micron size ($PM_{2.5}$)	IS 5182 (Part 24):2019	$\mu g/m^3$	21.2	60
3	Sulphur Dioxide (SO_2)	IS:5182: Part 02:2001	$\mu g/m^3$	4.6	80
4	Nitrogen Dioxide (NO_2)	IS:5182: Part 06:2006	$\mu g/m^3$	8.5	80
5	Carbon Monoxide (CO)	SARL/IOP/013 (Issue No:01, Issue Date – 01.03.2023)	mg/m^3	BDL (D.L – 1.1)	02

Remarks: Limits: *National Ambient air quality standards from CPCB. BDL- Below detectable limit. DL –Detectable limit.

For Shrient Analytical and Research Labs Pvt. Ltd

Verified 02/12/23

Authorized Signatory 02/12/23

J. GNANAPRAKASAM
Technical Manager

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TEST REPORT

Report No.	SARL/23-095	Report Date.	02.12.2023

Customer Name & Address	Project Name: Thiru R. Natarajan - TOR File No 9971 The proposed quarry of Thiru.R.Natarajan survey nos. 253/7, 259/5, 259/2 and 259/4 over an extent of 2.31.50 Ha, Karadikudi Village, Anaicut Taluk, Vellore District, Tamil Nadu.
Sample Description	AMBIENT AIR QUALITY
Sampling Procedure	IS – 5182 (Part – 14: 2000 & Part – V: Reaffirmed - 2003), CPCB Guide lines

Sample Location	A6-ANAICUT
Positioned height of Sampler	1.5 M above Ground Level

Customer Reference	As per work order	Sampling Procedure	24 hrs
Sample Reference No	SARL/A/CHE-095	Sample Received on	27.11.2023
Sample Collected by	LABORATORY	Test Commenced on	27.11.2023
Sample Collected Date	25.11.2023	Test Completed on	02.12.2023
Temperature	29°C	Relative Humidity	70%
Sample Condition	Fit for Analysis		

S. No.	Parameters	Protocol	Unit	Results	*Limits
1	Particulate Matter less than 10 micron size (PM_{10})	IS:5182: Part 23:2006	$\mu g/m^3$	46.2	100
2	Particulate Matter less than 2.5 micron size ($PM_{2.5}$)	IS 5182 (Part 24):2019	$\mu g/m^3$	20.7	60
3	Sulphur Dioxide (SO_2)	IS:5182: Part 02:2001	$\mu g/m^3$	4.1	80
4	Nitrogen Dioxide (NO_2)	IS:5182: Part 06:2006	$\mu g/m^3$	7.2	80
5	Carbon Monoxide (CO)	SARL/IOP/013 (Issue No:01, Issue Date – 01.03.2023)	mg/m^3	BDL (D.L – 1.1)	02

Remarks: Limits: *National Ambient air quality standards from CPCB. BDL- Below detectable limit. DL –Detectable limit.

For Shrient Analytical and Research Labs Pvt. Ltd

Verified 02/12/23

02/12/23

Authorized Signatory

J. GNANAPRAKASAM
Technical Manager

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TEST REPORT

Report No.	SARL/23-096

Report Date.	02.12.2023

Customer Name & Address	Project Name: Thiru R. Natarajan - TOR File No 9971 The proposed quarry of Thiru.R.Natarajan survey nos. 253/7, 259/5, 259/2 and 259/4 over an extent of 2.31.50 Ha, Karadikudi Village, Anaicut Taluk, Vellore District, Tamil Nadu.
Sample Description	AMBIENT AIR QUALITY
Sampling Procedure	IS – 5182 (Part – 14: 2000 & Part – V: Reaffirmed - 2003), CPCB Guide lines

Sample Location	A5-CDIYATHUR
Positioned height of Sampler	1.5 M above Ground Level

Customer Reference	As per work order	Sampling Procedure	24 hrs
Sample Reference No	SARL/A/CHE-096	Sample Received on	27.11.2023
Sample Collected by	LABORATORY	Test Commenced on	27.11.2023
Sample Collected Date	26.11.2023	Test Completed on	02.12.2023
Temperature	29°C	Relative Humidity	68%
Sample Condition	Fit for Analysis		

S. No.	Parameters	Protocol	Unit	Results	*Limits
1	Particulate Matter less than 10 micron size (PM_{10})	IS:5182: Part 23:2006	$\mu g/m^3$	53.4	100
2	Particulate Matter less than 2.5 micron size ($PM_{2.5}$)	IS 5182 (Part 24):2019	$\mu g/m^3$	24.6	60
3	Sulphur Dioxide (SO_2)	IS:5182: Part 02:2001	$\mu g/m^3$	5.2	80
4	Nitrogen Dioxide (NO_2)	IS:5182: Part 06:2006	$\mu g/m^3$	10.1	80
5	Carbon Monoxide (CO)	SARL/IOP/013 (Issue No:01, Issue Date – 01.03.2023)	mg/m^3	BDL (D.L – 1.1)	02

Remarks: Limits: *National Ambient air quality standards from CPCB. BDL- Below detectable limit. DL –Detectable limit.

For Shrient Analytical and Research Labs Pvt. Ltd

02/12/23

Verified

02/12/23

Authorized Signatory
J. GNANAPRAKASAM
Technical Manager

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TEST REPORT

Report No.	SARL/23-097

Report Date.	02.12.2023

Customer Name & Address	Project Name: Thiru R. Natarajan - TOR File No 9971 The proposed quarry of Thiru.R.Natarajan survey nos. 253/7, 259/5, 259/2 and 259/4 over an extent of 2.31.50 Ha, Karadikudi Village, Anaicut Taluk, Vellore District, Tamil Nadu.
Sample Description	AMBIENT AIR QUALITY
Sampling Procedure	IS – 5182 (Part – 14: 2000 & Part – V: Reaffirmed - 2003), CPCB Guide lines

Sample Location	A6-ANAICUT
Positioned height of Sampler	1.5 M above Ground Level

Customer Reference	As per work order	Sampling Procedure	24 hrs
Sample Reference No	SARL/A/CHE-097	Sample Received on	27.11.2023
Sample Collected by	LABORATORY	Test Commenced on	27.11.2023
Sample Collected Date	26.11.2023	Test Completed on	02.12.2023
Temperature	29°C	Relative Humidity	68%
Sample Condition	Fit for Analysis		

S. No.	Parameters	Protocol	Unit	Results	*Limits
1	Particulate Matter less than 10 micron size (PM_{10})	IS:5182: Part 23:2006	$\mu g/m^3$	53.3	100
2	Particulate Matter less than 2.5 micron size ($PM_{2.5}$)	IS 5182 (Part 24):2019	$\mu g/m^3$	23.9	60
3	Sulphur Dioxide (SO_2)	IS:5182: Part 02:2001	$\mu g/m^3$	4.7	80
4	Nitrogen Dioxide (NO_2)	IS:5182: Part 06:2006	$\mu g/m^3$	7.3	80
5	Carbon Monoxide (CO)	SARL/IOP/013 (Issue No:01, Issue Date – 01.03.2023)	mg/m^3	BDL (D.L – 1.1)	02

Remarks: Limits: *National Ambient air quality standards from CPCB. BDL- Below detectable limit. DL –Detectable limit.

For Shrient Analytical and Research Labs Pvt. Ltd

Verified 02/12/23

Authorized Signatory 02/12/23

J. GNANAPRAKASAM
Technical Manager

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TEST REPORT

Report No.	SARL/23-098

Report Date.	09.12.2023

Customer Name & Address	Project Name: Thiru R. Natarajan - TOR File No 9971 The proposed quarry of Thiru.R.Natarajan survey nos. 253/7, 259/5, 259/2 and 259/4 over an extent of 2.31.50 Ha, Karadikudi Village, Anaicut Taluk, Vellore District, Tamil Nadu.
Sample Description	AMBIENT AIR QUALITY
Sampling Procedure	IS – 5182 (Part – 14: 2000 & Part – V: Reaffirmed - 2003), CPCB Guide lines

Sample Location	A5-ODIYATHUR
Positioned height of Sampler	1.5 M above Ground Level

Customer Reference	As per work order	Sampling Procedure	24 hrs
Sample Reference No	SARL/A/CHE-098	Sample Received on	04.12.2023
Sample Collected by	LABORATORY	Test Commenced on	04.12.2023
Sample Collected Date	28.11.2023	Test Completed on	09.12.2023
Temperature	29°C	Relative Humidity	67%
Sample Condition	Fit for Analysis		

S. No.	Parameters	Protocol	Unit	Results	*Limits
1	Particulate Matter less than 10 micron size (PM_{10})	IS:5182: Part 23:2006	$\mu g/m^3$	48.6	100
2	Particulate Matter less than 2.5 micron size ($PM_{2.5}$)	IS 5182 (Part 24):2019	$\mu g/m^3$	22.4	60
3	Sulphur Dioxide (SO_2)	IS:5182: Part 02:2001	$\mu g/m^3$	4.4	80
4	Nitrogen Dioxide (NO_2)	IS:5182: Part 06:2006	$\mu g/m^3$	7.9	80
5	Carbon Monoxide (CO)	SARL/IOP/013 (Issue No:01, Issue Date – 01.03.2023)	mg/m^3	BDL (D.L – 1.1)	02

Remarks: Limits: *National Ambient air quality standards from CPCB. BDL- Below detectable limit. DL –Detectable limit.

For Shrient Analytical and Research Labs Pvt. Ltd

Verified 09/12/2023

Authorized Signatory

J. GNANAPRAKASAM
Technical Manager

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TEST REPORT

Report No.	SARL/23-099

Report Date.	09.12.2023

Customer Name & Address	Project Name: Thiru R. Natarajan - TOR File No 9971 The proposed quarry of Thiru.R.Natarajan survey nos. 253/7, 259/5, 259/2 and 259/4 over an extent of 2.31.50 Ha, Karadikudi Village, Anaicut Taluk, Vellore District, Tamil Nadu.
Sample Description	AMBIENT AIR QUALITY
Sampling Procedure	IS – 5182 (Part – 14: 2000 & Part – V: Reaffirmed - 2003), CPCB Guide lines

Sample Location	A6-ANAICUT
Positioned height of Sampler	1.5 M above Ground Level

Customer Reference	As per work order	Sampling Procedure	24 hrs
Sample Reference No	SARL/A/CHE-099	Sample Received on	04.12.2023
Sample Collected by	LABORATORY	Test Commenced on	04.12.2023
Sample Collected Date	28.11.2023	Test Completed on	09.12.2023
Temperature	29°C	Relative Humidity	67%
Sample Condition	Fit for Analysis		

S. No.	Parameters	Protocol	Unit	Results	*Limits
1	Particulate Matter less than 10 micron size (PM_{10})	IS:5182: Part 23:2006	$\mu g/m^3$	47.2	100
2	Particulate Matter less than 2.5 micron size ($PM_{2.5}$)	IS 5182 (Part 24):2019	$\mu g/m^3$	21.2	60
3	Sulphur Dioxide (SO_2)	IS:5182: Part 02:2001	$\mu g/m^3$	4.2	80
4	Nitrogen Dioxide (NO_2)	IS:5182: Part 06:2006	$\mu g/m^3$	7.5	80
5	Carbon Monoxide (CO)	SARL/IOP/013 (Issue No:01, Issue Date – 01.03.2023)	mg/m^3	BDL (D.L – 1.1)	02

Remarks: Limits: *National Ambient air quality standards from CPCB. BDL- Below detectable limit. DL –Detectable limit.

For Shrient Analytical and Research Labs Pvt. Ltd

Verified 09/12/23

Authorized Signatory 09/12/23

J. GNANAPRAKASAM
Technical Manager

END OF THE REPORT

Please Contact:
For any Technical Issues & Complaints: vmalnath@shrientanalytical.com

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Phone No: 9841074398 / 9698141777 E-mail : Info@shrientanalytical.com
Website : www.shrientanalytical.com

TEST REPORT

Report No.	SARL/23-100

Report Date.	09.12.2023

Customer Name & Address	Project Name: Thiru R. Natarajan - TOR File No 9971 The proposed quarry of Thiru.R.Natarajan survey nos. 253/7, 259/5, 259/2 and 259/4 over an extent of 2.31.50 Ha, Karadikudi Village, Anaicut Taluk, Vellore District, Tamil Nadu.
Sample Description	AMBIENT AIR QUALITY
Sampling Procedure	IS – 5182 (Part – 14: 2000 & Part – V: Reaffirmed - 2003), CPCB Guide lines

Sample Location	A5-ODIYATHUR
Positioned height of Sampler	1.5 M above Ground Level

Customer Reference	As per work order	Sampling Procedure	24 hrs
Sample Reference No	SARL/A/CHE-100	Sample Received on	04.12.2023
Sample Collected by	LABORATORY	Test Commenced on	04.12.2023
Sample Collected Date	29.11.2023	Test Completed on	09.12.2023
Temperature	28°C	Relative Humidity	72%
Sample Condition	Fit for Analysis		

S. No.	Parameters	Protocol	Unit	Results	*Limits
1	Particulate Matter less than 10 micron size (PM_{10})	IS:5182: Part 23:2006	$\mu g/m^3$	46.3	100
2	Particulate Matter less than 2.5 micron size ($PM_{2.5}$)	IS 5182 (Part 24):2019	$\mu g/m^3$	21.3	60
3	Sulphur Dioxide (SO_2)	IS:5182: Part 02:2001	$\mu g/m^3$	4.9	80
4	Nitrogen Dioxide (NO_2)	IS:5182: Part 06:2006	$\mu g/m^3$	8.4	80
5	Carbon Monoxide (CO)	SARL/IOP/013 (Issue No:01, Issue Date – 01.03.2023)	mg/m^3	BDL (D.L – 1.1)	02

Remarks: Limits: *National Ambient air quality standards from CPCB. BDL- Below detectable limit. DL –Detectable limit.

For Shrient Analytical and Research Labs Pvt. Ltd

Verified 09/12/23

Authorized Signatory 09/12/23

J. GNANAPRAKASAM
Technical Manager

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TEST REPORT

Report No.	SARL/23-101

Report Date.	09.12.2023

Customer Name & Address	Project Name: Thiru R. Natarajan - TOR File No 9971 The proposed quarry of Thiru.R.Natarajan survey nos. 253/7, 259/5, 259/2 and 259/4 over an extent of 2.31.50 Ha, Karadikudi Village, Anaicut Taluk, Vellore District, Tamil Nadu.
Sample Description	AMBIENT AIR QUALITY
Sampling Procedure	IS – 5182 (Part – 14: 2000 & Part – V: Reaffirmed - 2003), CPCB Guide lines

Sample Location	A6-ANAICUT
Positioned height of Sampler	1.5 M above Ground Level

Customer Reference	As per work order	Sampling Procedure	24 hrs
Sample Reference No	SARL/A/CHE-101	Sample Received on	04.12.2023
Sample Collected by	LABORATORY	Test Commenced on	04.12.2023
Sample Collected Date	29.11.2023	Test Completed on	09.12.2023
Temperature	28°C	Relative Humidity	72%
Sample Condition	Fit for Analysis		

S. No.	Parameters	Protocol	Unit	Results	*Limits
1	Particulate Matter less than 10 micron size (PM_{10})	IS:5182: Part 23:2006	$\mu g/m^3$	54.1	100
2	Particulate Matter less than 2.5 micron size ($PM_{2.5}$)	IS 5182 (Part 24):2019	$\mu g/m^3$	24.3	60
3	Sulphur Dioxide (SO_2)	IS:5182: Part 02:2001	$\mu g/m^3$	4.9	80
4	Nitrogen Dioxide (NO_2)	IS:5182: Part 06:2006	$\mu g/m^3$	6.7	80
5	Carbon Monoxide (CO)	SARL/IOP/013 (Issue No:01, Issue Date – 01.03.2023)	mg/m^3	BDL (D.L – 1.1)	02

Remarks: Limits: *National Ambient air quality standards from CPCB. BDL- Below detectable limit. DL –Detectable limit.

For Shrient Analytical and Research Labs Pvt. Ltd

Verified 09/12/23

Authorized Signatory

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J. GNANAPRAKASAM
Technical Manager

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TEST REPORT

Report No.	SARL/23-102

Report Date.	09.12.2023

Customer Name & Address	Project Name: Thiru R. Natarajan - TOR File No 9971 The proposed quarry of Thiru.R.Natarajan survey nos. 253/7, 259/5, 259/2 and 259/4 over an extent of 2.31.50 Ha, Karadikudi Village, Anaicut Taluk, Vellore District, Tamil Nadu.
Sample Description	AMBIENT AIR QUALITY
Sampling Procedure	IS – 5182 (Part – 14: 2000 & Part – V: Reaffirmed - 2003), CPCB Guide lines

Sample Location	A3-PICHANATHAM
Positioned height of Sampler	1.5 M above Ground Level

Customer Reference	As per work order	Sampling Procedure	24 hrs
Sample Reference No	SARL/A/CHE-102	Sample Received on	04.12.2023
Sample Collected by	LABORATORY	Test Commenced on	04.12.2023
Sample Collected Date	30.11.2023	Test Completed on	09.12.2023
Temperature	24°C	Relative Humidity	91%
Sample Condition	Fit for Analysis		

S. No.	Parameters	Protocol	Unit	Results	*Limits
1	Particulate Matter less than 10 micron size (PM_{10})	IS:5182: Part 23:2006	$\mu g/m^3$	48.6	100
2	Particulate Matter less than 2.5 micron size ($PM_{2.5}$)	IS 5182 (Part 24):2019	$\mu g/m^3$	25.1	60
3	Sulphur Dioxide (SO_2)	IS:5182: Part 02:2001	$\mu g/m^3$	5.4	80
4	Nitrogen Dioxide (NO_2)	IS:5182: Part 06:2006	$\mu g/m^3$	6.8	80
5	Carbon Monoxide (CO)	SARL/IOP/013 (Issue No:01, Issue Date – 01.03.2023)	mg/m^3	BDL (D.L – 1.1)	02

Remarks: Limits: *National Ambient air quality standards from CPCB. BDL- Below detectable limit. DL --Detectable limit.

For Shrient Analytical and Research Labs Pvt. Ltd

Verified 09/12/23

Authorized Signatory 09/12/23

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J. GNANAPRAKASAM
Technical Manager

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TEST REPORT

Report No.	SARL/23-103

Report Date.	09.12.2023

Customer Name & Address	Project Name: Thiru R. Natarajan - TOR File No 9971 The proposed quarry of Thiru.R.Natarajan survey nos. 253/7, 259/5, 259/2 and 259/4 over an extent of 2.31.50 Ha, Karadikudi Village, Anaicut Taluk, Vellore District, Tamil Nadu.
Sample Description	AMBIENT AIR QUALITY
Sampling Procedure	IS – 5182 (Part – 14: 2000 & Part – V: Reaffirmed - 2003), CPCB Guide lines

Sample Location	A4-KARADIKUDI
Positioned height of Sampler	1.5 M above Ground Level

Customer Reference	As per work order	Sampling Procedure	24 hrs
Sample Reference No	SARL/A/CHE-103	Sample Received on	04.12.2023
Sample Collected by	LABORATORY	Test Commenced on	04.12.2023
Sample Collected Date	30.11.2023	Test Completed on	09.12.2023
Temperature	24°C	Relative Humidity	91%
Sample Condition	Fit for Analysis		

S. No.	Parameters	Protocol	Unit	Results	*Limits
1	Particulate Matter less than 10 micron size (PM_{10})	IS:5182: Part 23:2006	$\mu g/m^3$	56.4	100
2	Particulate Matter less than 2.5 micron size ($PM_{2.5}$)	IS 5182 (Part 24):2019	$\mu g/m^3$	25.8	60
3	Sulphur Dioxide (SO_2)	IS:5182: Part 02:2001	$\mu g/m^3$	6.6	80
4	Nitrogen Dioxide (NO_2)	IS:5182: Part 06:2006	$\mu g/m^3$	10.1	80
5	Carbon Monoxide (CO)	SARL/IOP/013 (Issue No:01, Issue Date – 01.03.2023)	mg/m^3	BDL (D.L – 1.1)	02

Remarks: Limits: *National Ambient air quality standards from CPCB. BDL- Below detectable limit. DL –Detectable limit.

For Shrient Analytical and Research Labs Pvt. Ltd

Verified 09/12/23

08/12/23

Authorized Signatory

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J. GNANAPRAKASAM
Technical Manager

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TEST REPORT

Report No.	SARL/23-104

Report Date.	09.12.2023

Customer Name & Address	Project Name: Thiru R. Natarajan - TOR File No 9971 The proposed quarry of Thiru.R.Natarajan survey nos. 253/7, 259/5, 259/2 and 259/4 over an extent of 2.31.50 Ha, Karadikudi Village, Anaicut Taluk, Vellore District, Tamil Nadu.
Sample Description	AMBIENT AIR QUALITY
Sampling Procedure	IS – 5182 (Part – 14: 2000 & Part – V: Reaffirmed - 2003), CPCB Guide lines

Sample Location	A3-PICHANATHAM
Positioned height of Sampler	1.5 M above Ground Level

Customer Reference	As per work order	Sampling Procedure	24 hrs
Sample Reference No	SARL/A/CHE-104	Sample Received on	04.12.2023
Sample Collected by	LABORATORY	Test Commenced on	04.12.2023
Sample Collected Date	01.12.2023	Test Completed on	09.12.2023
Temperature	29°C	Relative Humidity	64%
Sample Condition	Fit for Analysis		

S. No.	Parameters	Protocol	Unit	Results	*Limits
1	Particulate Matter less than 10 micron size (PM_{10})	IS:5182: Part 23:2006	$\mu g/m^3$	45.6	100
2	Particulate Matter less than 2.5 micron size ($PM_{2.5}$)	IS 5182 (Part 24):2019	$\mu g/m^3$	24.1	60
3	Sulphur Dioxide (SO_2)	IS:5182: Part 02:2001	$\mu g/m^3$	4.2	80
4	Nitrogen Dioxide (NO_2)	IS:5182: Part 06:2006	$\mu g/m^3$	7.4	80
5	Carbon Monoxide (CO)	SARL/IOP/013 (Issue No:01, Issue Date – 01.03.2023)	mg/m^3	BDL (D.L – 1.1)	02

Remarks: Limits: *National Ambient air quality standards from CPCB. BDL- Below detectable limit. DL –Detectable limit.

For Shrient Analytical and Research Labs Pvt. Ltd

Verified 09/12/23

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J. GNANAPRAKASAM
Technical Manager

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TEST REPORT

Report No.	SARL/23-105

Report Date.	09.12.2023

Customer Name & Address	Project Name: Thiru R. Natarajan - TOR File No 9971 The proposed quarry of Thiru.R.Natarajan survey nos. 253/7, 259/5, 259/2 and 259/4 over an extent of 2.31.50 Ha, Karadikudi Village, Anaicut Taluk, Vellore District, Tamil Nadu.
Sample Description	AMBIENT AIR QUALITY
Sampling Procedure	IS – 5182 (Part – 14: 2000 & Part – V: Reaffirmed - 2003), CPCB Guide lines

Sample Location	A4-KARADIKUDI
Positioned height of Sampler	1.5 M above Ground Level

Customer Reference	As per work order	Sampling Procedure	24 hrs
Sample Reference No	SARL/A/CHE-105	Sample Received on	04.12.2023
Sample Collected by	LABORATORY	Test Commenced on	04.12.2023
Sample Collected Date	01.12.2023	Test Completed on	09.12.2023
Temperature	29°C	Relative Humidity	64%
Sample Condition	Fit for Analysis		

S. No.	Parameters	Protocol	Unit	Results	*Limits
1	Particulate Matter less than 10 micron size (PM_{10})	IS:5182: Part 23:2006	$\mu g/m^3$	49.6	100
2	Particulate Matter less than 2.5 micron size ($PM_{2.5}$)	IS 5182 (Part 24):2019	$\mu g/m^3$	23.1	60
3	Sulphur Dioxide (SO_2)	IS:5182: Part 02:2001	$\mu g/m^3$	6.2	80
4	Nitrogen Dioxide (NO_2)	IS:5182: Part 06:2006	$\mu g/m^3$	11.7	80
5	Carbon Monoxide (CO)	SARL/IOP/013 (Issue No:01, Issue Date – 01.03.2023)	mg/m^3	BDL (D.L – 1.1)	02

Remarks: Limits: *National Ambient air quality standards from CPCB. BDL- Below detectable limit. DL –Detectable limit.

For Shrient Analytical and Research Labs Pvt. Ltd

Verified 09/12/23

Authorized Signatory 09/12/23

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J. GNANAPRAKASAM
Technical Manager

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TEST REPORT

Report No.	SARL/23-106

Report Date.	09.12.2023

Customer Name & Address	Project Name: Thiru R. Natarajan - TOR File No 9971 The proposed quarry of Thiru.R.Natarajan survey nos. 253/7, 259/5, 259/2 and 259/4 over an extent of 2.31.50 Ha, Karadikudi Village, Anaicut Taluk, Vellore District, Tamil Nadu.
Sample Description	AMBIENT AIR QUALITY
Sampling Procedure	IS – 5182 (Part – 14: 2000 & Part – V: Reaffirmed - 2003), CPCB Guide lines

Sample Location	A1-WITHIN MINE LEASE AREA
Positioned height of Sampler	1.5 M above Ground Level

Customer Reference	As per work order	Sampling Procedure	24 hrs
Sample Reference No	SARL/A/CHE-106	Sample Received on	04.12.2023
Sample Collected by	LABORATORY	Test Commenced on	04.12.2023
Sample Collected Date	02.12.2023	Test Completed on	09.12.2023
Temperature	28°C	Relative Humidity	64%
Sample Condition	Fit for Analysis		

S. No.	Parameters	Protocol	Unit	Results	*Limits
1	Particulate Matter less than 10 micron size (PM_{10})	IS:5182: Part 23:2006	$\mu g/m^3$	56.5	100
2	Particulate Matter less than 2.5 micron size ($PM_{2.5}$)	IS 5182 (Part 24):2019	$\mu g/m^3$	25.3	60
3	Sulphur Dioxide (SO_2)	IS:5182: Part 02:2001	$\mu g/m^3$	4.5	80
4	Nitrogen Dioxide (NO_2)	IS:5182: Part 06:2006	$\mu g/m^3$	9.9	80
5	Carbon Monoxide (CO)	SARL/IOP/013 (Issue No:01, Issue Date – 01.03.2023)	mg/m^3	BDL (D.L – 1.1)	02

Remarks: Limits: *National Ambient air quality standards from CPCB. BDL- Below detectable limit. DL –Detectable limit.

For Shrient Analytical and Research Labs Pvt. Ltd

Verified 09/12/23

09/12/23

Authorized Signatory

END OF THE REPORT

J. GNANAPRAKASAM
Technical Manager

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TEST REPORT

Report No.	SARL/23-107

Report Date.	09.12.2023

Customer Name & Address	Project Name: Thiru R. Natarajan - TOR File No 9971 The proposed quarry of Thiru.R.Natarajan survey nos. 253/7, 259/5, 259/2 and 259/4 over an extent of 2.31.50 Ha, Karadikudi Village, Anaicut Taluk, Vellore District, Tamil Nadu.
Sample Description	AMBIENT AIR QUALITY
Sampling Procedure	IS – 5182 (Part – 14: 2000 & Part – V: Reaffirmed - 2003), CPCB Guide lines

Sample Location	A2-THANGAL
Positioned height of Sampler	1.5 M above Ground Level

Customer Reference	As per work order	Sampling Procedure	24 hrs
Sample Reference No	SARL/A/CHE-107	Sample Received on	04.12.2023
Sample Collected by	LABORATORY	Test Commenced on	04.12.2023
Sample Collected Date	02.12.2023	Test Completed on	09.12.2023
Temperature	28°C	Relative Humidity	64%
Sample Condition	Fit for Analysis		

S. No.	Parameters	Protocol	Unit	Results	*Limits
1	Particulate Matter less than 10 micron size (PM_{10})	IS:5182: Part 23:2006	$\mu g/m^3$	52.2	100
2	Particulate Matter less than 2.5 micron size ($PM_{2.5}$)	IS 5182 (Part 24):2019	$\mu g/m^3$	25.6	60
3	Sulphur Dioxide (SO_2)	IS:5182: Part 02:2001	$\mu g/m^3$	4.6	80
4	Nitrogen Dioxide (NO_2)	IS:5182: Part 06:2006	$\mu g/m^3$	7.7	80
5	Carbon Monoxide (CO)	SARL/IOP/013 (Issue No:01, Issue Date – 01.03.2023)	mg/m^3	BDL (D.L – 1.1)	02

Remarks: Limits: *National Ambient air quality standards from CPCB. BDL- Below detectable limit. DL –Detectable limit.

For Shrient Analytical and Research Labs Pvt. Ltd

09/12/23

Verified

09/12/23

Authorized Signatory

J. GNANAPRAKASAM
Technical Manager

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TEST REPORT

Report No.	SARL/23-108

Report Date.	09.12.2023

Customer Name & Address	Project Name: Thiru R. Natarajan - TOR File No 9971 The proposed quarry of Thiru.R.Natarajan survey nos. 253/7, 259/5, 259/2 and 259/4 over an extent of 2.31.50 Ha, Karadikudi Village, Anaicut Taluk, Vellore District, Tamil Nadu.
Sample Description	AMBIENT AIR QUALITY
Sampling Procedure	IS – 5182 (Part – 14: 2000 & Part – V: Reaffirmed - 2003), CPCB Guide lines

Sample Location	A1-WITHIN MINE LEASE AREA
Positioned height of Sampler	1.5 M above Ground Level

Customer Reference	As per work order	Sampling Procedure	24 hrs
Sample Reference No	SARL/A/CHE-108	Sample Received on	04.12.2023
Sample Collected by	LABORATORY	Test Commenced on	04.12.2023
Sample Collected Date	03.12.2023	Test Completed on	09.12.2023
Temperature	27°C	Relative Humidity	71%
Sample Condition	Fit for Analysis		

S. No.	Parameters	Protocol	Unit	Results	*Limits
1	Particulate Matter less than 10 micron size (PM_{10})	IS:5182: Part 23:2006	$\mu g/m^3$	63.4	100
2	Particulate Matter less than 2.5 micron size ($PM_{2.5}$)	IS 5182 (Part 24):2019	$\mu g/m^3$	26.6	60
3	Sulphur Dioxide (SO_2)	IS:5182: Part 02:2001	$\mu g/m^3$	5.2	80
4	Nitrogen Dioxide (NO_2)	IS:5182: Part 06:2006	$\mu g/m^3$	9.1	80
5	Carbon Monoxide (CO)	SARL/IOP/013 (Issue No:01, Issue Date – 01.03.2023)	mg/m^3	BDL (D.L – 1.1)	02

Remarks: Limits: *National Ambient air quality standards from CPCB. BDL- Below detectable limit. DL –Detectable limit.

For Shrient Analytical and Research Labs Pvt. Ltd

Verified 09/12/23

04/12/23

Authorized Signatory

END OF THE REPORT

J. GNANAPRAKASAM
Technical Manager

Please Contact:
For any Technical Issues & Complaints: vimal.nath@shrientanalytical.com

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TEST REPORT

Report No.	SARL/23-109

Report Date.	09.12.2023

Customer Name & Address	Project Name: Thiru R. Natarajan - TOR File No 9971 The proposed quarry of Thiru.R.Natarajan survey nos. 253/7, 259/5, 259/2 and 259/4 over an extent of 2.31.50 Ha, Karadikudi Village, Anaicut Taluk, Vellore District, Tamil Nadu.
Sample Description	AMBIENT AIR QUALITY
Sampling Procedure	IS – 5182 (Part – 14: 2000 & Part – V: Reaffirmed - 2003), CPCB Guide lines

Sample Location	A2-THANGAL
Positioned height of Sampler	1.5 M above Ground Level

Customer Reference	As per work order	Sampling Procedure	24 hrs
Sample Reference No	SARL/A/CHE-109	Sample Received on	04.12.2023
Sample Collected by	LABORATORY	Test Commenced on	04.12.2023
Sample Collected Date	03.12.2023	Test Completed on	09.12.2023
Temperature	27°C	Relative Humidity	71%
Sample Condition	Fit for Analysis		

S. No.	Parameters	Protocol	Unit	Results	*Limits
1	Particulate Matter less than 10 micron size (PM_{10})	IS:5182: Part 23:2006	$\mu g/m^3$	49.4	100
2	Particulate Matter less than 2.5 micron size ($PM_{2.5}$)	IS 5182 (Part 24):2019	$\mu g/m^3$	23.6	60
3	Sulphur Dioxide (SO_2)	IS:5182: Part 02:2001	$\mu g/m^3$	6.8	80
4	Nitrogen Dioxide (NO_2)	IS:5182: Part 06:2006	$\mu g/m^3$	7.3	80
5	Carbon Monoxide (CO)	SARL/IOP/013 (Issue No:01, Issue Date – 01.03.2023)	mg/m^3	BDL (D.L – 1.1)	02

Remarks: Limits: *National Ambient air quality standards from CPCB. BDL- Below detectable limit. DL –Detectable limit.

For Shrient Analytical and Research Labs Pvt. Ltd

Verified 09/12/23

09/12/23

Authorized Signatory

J. GNANAPRAKASAM
Technical Manager

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TEST REPORT

Report No.	SARL/23-110

Report Date.	16.12.2023

Customer Name & Address	Project Name: Thiru R. Natarajan - TOR File No 9971 The proposed quarry of Thiru.R.Natarajan survey nos. 253/7, 259/5, 259/2 and 259/4 over an extent of 2.31.50 Ha, Karadikudi Village, Anaicut Taluk, Vellore District, Tamil Nadu.
Sample Description	AMBIENT AIR QUALITY
Sampling Procedure	IS – 5182 (Part – 14: 2000 & Part – V: Reaffirmed - 2003), CPCB Guide lines

Sample Location	A1-WITHIN MINE LEASE AREA
Positioned height of Sampler	1.5 M above Ground Level

Customer Reference	As per work order	Sampling Procedure	24 hrs
Sample Reference No	SARL/A/CHE-110	Sample Received on	11.12.2023
Sample Collected by	LABORATORY	Test Commenced on	11.12.2023
Sample Collected Date	05.12.2023	Test Completed on	16.12.2023
Temperature	30°C	Relative Humidity	60%
Sample Condition	Fit for Analysis		

S. No.	Parameters	Protocol	Unit	Results	*Limits
1	Particulate Matter less than 10 micron size (PM_{10})	IS:5182: Part 23:2006	$\mu g/m^3$	61.8	100
2	Particulate Matter less than 2.5 micron size ($PM_{2.5}$)	IS 5182 (Part 24):2019	$\mu g/m^3$	29.9	60
3	Sulphur Dioxide (SO_2)	IS:5182: Part 02:2001	$\mu g/m^3$	4.9	80
4	Nitrogen Dioxide (NO_2)	IS:5182: Part 06:2006	$\mu g/m^3$	9.5	80
5	Carbon Monoxide (CO)	SARL/IOP/013 (Issue No:01, Issue Date – 01.03.2023)	mg/m^3	BDL (D.L – 1.1)	02

Remarks: Limits: *National Ambient air quality standards from CPCB. BDL- Below detectable limit. DL –Detectable limit.

For Shrient Analytical and Research Labs Pvt. Ltd

Verified 16/12/23

16/12/23

Authorized Signatory

J. GNANAPRAKASAM
Technical Manager

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TEST REPORT

Report No.	SARL/23-111	Report Date.	16.12.2023

Customer Name & Address	Project Name: Thiru R. Natarajan - TOR File No 9971 The proposed quarry of Thiru.R.Natarajan survey nos. 253/7, 259/5, 259/2 and 259/4 over an extent of 2.31.50 Ha, Karadikudi Village, Anaicut Taluk, Vellore District, Tamil Nadu.
Sample Description	AMBIENT AIR QUALITY
Sampling Procedure	IS – 5182 (Part – 14: 2000 & Part – V: Reaffirmed - 2003), CPCB Guide lines

Sample Location	A2-THANGAL
Positioned height of Sampler	1.5 M above Ground Level

Customer Reference	As per work order	Sampling Procedure	24 hrs
Sample Reference No	SARL/A/CHE-111	Sample Received on	11.12.2023
Sample Collected by	LABORATORY	Test Commenced on	11.12.2023
Sample Collected Date	05.12.2023	Test Completed on	16.12.2023
Temperature	30°C	Relative Humidity	60%
Sample Condition	Fit for Analysis		

S. No.	Parameters	Protocol	Unit	Results	*Limits
1	Particulate Matter less than 10 micron size (PM_{10})	IS:5182: Part 23:2006	$\mu g/m^3$	51.6	100
2	Particulate Matter less than 2.5 micron size ($PM_{2.5}$)	IS 5182 (Part 24):2019	$\mu g/m^3$	25.7	60
3	Sulphur Dioxide (SO_2)	IS:5182: Part 02:2001	$\mu g/m^3$	5.6	80
4	Nitrogen Dioxide (NO_2)	IS:5182: Part 06:2006	$\mu g/m^3$	8.1	80
5	Carbon Monoxide (CO)	SARL/IOP/013 (Issue No:01, Issue Date – 01.03.2023)	mg/m^3	BDL (D.L – 1.1)	02

Remarks: Limits: *National Ambient air quality standards from CPCB. BDL- Below detectable limit. DL –Detectable limit.

For Shrient Analytical and Research Labs Pvt. Ltd

Verified 16/12/23

Authorized Signatory

J. GNANAPRAKASAM
Technical Manager

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TEST REPORT

Report No.	SARL/23-112

Report Date.	16.12.2023

Customer Name & Address	Project Name: Thiru R. Natarajan - TOR File No 9971 The proposed quarry of Thiru.R.Natarajan survey nos. 253/7, 259/5, 259/2 and 259/4 over an extent of 2.31.50 Ha, Karadikudi Village, Anaicut Taluk, Vellore District, Tamil Nadu.
Sample Description	AMBIENT AIR QUALITY
Sampling Procedure	IS – 5182 (Part – 14: 2000 & Part – V: Reaffirmed - 2003), CPCB Guide lines

Sample Location	A1-WITHIN MINE LEASE AREA
Positioned height of Sampler	1.5 M above Ground Level

Customer Reference	As per work order	Sampling Procedure	24 hrs
Sample Reference No	SARL/A/CHE-112	Sample Received on	11.12.2023
Sample Collected by	LABORATORY	Test Commenced on	11.12.2023
Sample Collected Date	06.12.2023	Test Completed on	16.12.2023
Temperature	30°C	Relative Humidity	57%
Sample Condition	Fit for Analysis		

S. No.	Parameters	Protocol	Unit	Results	*Limits
1	Particulate Matter less than 10 micron size (PM_{10})	IS:5182: Part 23:2006	$\mu g/m^3$	64.4	100
2	Particulate Matter less than 2.5 micron size ($PM_{2.5}$)	IS 5182 (Part 24):2019	$\mu g/m^3$	27.9	60
3	Sulphur Dioxide (SO_2)	IS:5182: Part 02:2001	$\mu g/m^3$	5.2	80
4	Nitrogen Dioxide (NO_2)	IS:5182: Part 06:2006	$\mu g/m^3$	9.9	80
5	Carbon Monoxide (CO)	SARL/IOP/013 (Issue No:01, Issue Date – 01.03.2023)	mg/m^3	BDL (D.L – 1.1)	02

Remarks: Limits: *National Ambient air quality standards from CPCB. BDL- Below detectable limit. DL –Detectable limit.

For Shrient Analytical and Research Labs Pvt. Ltd

Verified 16/12/23

Authorized Signatory
J. GNANAPRAKASAM
Technical Manager

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TEST REPORT

Report No.	SARL/23-113

Report Date.	16.12.2023

Customer Name & Address	Project Name: Thiru R. Natarajan - TOR File No 9971 The proposed quarry of Thiru.R.Natarajan survey nos. 253/7, 259/5, 259/2 and 259/4 over an extent of 2.31.50 Ha, Karadikudi Village, Anaicut Taluk, Vellore District, Tamil Nadu.
Sample Description	AMBIENT AIR QUALITY
Sampling Procedure	IS – 5182 (Part – 14: 2000 & Part – V: Reaffirmed - 2003), CPCB Guide lines

Sample Location	A2-THANGAL
Positioned height of Sampler	1.5 M above Ground Level

Customer Reference	As per work order	Sampling Procedure	24 hrs
Sample Reference No	SARL/A/CHE-113	Sample Received on	11.12.2023
Sample Collected by	LABORATORY	Test Commenced on	11.12.2023
Sample Collected Date	06.12.2023	Test Completed on	16.12.2023
Temperature	30°C	Relative Humidity	57%
Sample Condition	Fit for Analysis		

S. No.	Parameters	Protocol	Unit	Results	*Limits
1	Particulate Matter less than 10 micron size (PM_{10})	IS:5182: Part 23:2006	$\mu g/m^3$	54.1	100
2	Particulate Matter less than 2.5 micron size ($PM_{2.5}$)	IS 5182 (Part 24):2019	$\mu g/m^3$	24.7	60
3	Sulphur Dioxide (SO_2)	IS:5182: Part 02:2001	$\mu g/m^3$	4.2	80
4	Nitrogen Dioxide (NO_2)	IS:5182: Part 06:2006	$\mu g/m^3$	8.7	80
5	Carbon Monoxide (CO)	SARL/IOP/013 (Issue No:01, Issue Date – 01.03.2023)	mg/m^3	BDL (D.L – 1.1)	02

Remarks: Limits: *National Ambient air quality standards from CPCB. BDL- Below detectable limit. DL –Detectable limit.

For Shrient Analytical and Research Labs Pvt. Ltd

Verified 16/12/23

Authorized Signatory 16/12/23

END OF THE REPORT

J. GNANAPRAKASAM
Technical Manager

Please Contact:
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TEST REPORT

Report No.	SARL/23-114

Report Date.	16.12.2023

Customer Name & Address	Project Name: Thiru R. Natarajan - TOR File No 9971 The proposed quarry of Thiru.R.Natarajan survey nos. 253/7, 259/5, 259/2 and 259/4 over an extent of 2.31.50 Ha, Karadikudi Village, Anaicut Taluk, Vellore District, Tamil Nadu.
Sample Description	AMBIENT AIR QUALITY
Sampling Procedure	IS – 5182 (Part – 14: 2000 & Part – V: Reaffirmed - 2003), CPCB Guide lines

Sample Location	A3-PICHANATHAM
Positioned height of Sampler	1.5 M above Ground Level

Customer Reference	As per work order	Sampling Procedure	24 hrs
Sample Reference No	SARL/A/CHE-114	Sample Received on	11.12.2023
Sample Collected by	LABORATORY	Test Commenced on	11.12.2023
Sample Collected Date	07.12.2023	Test Completed on	16.12.2023
Temperature	31°C	Relative Humidity	54%
Sample Condition	Fit for Analysis		

S. No.	Parameters	Protocol	Unit	Results	*Limits
1	Particulate Matter less than 10 micron size (PM_{10})	IS:5182: Part 23:2006	$\mu g/m^3$	42.2	100
2	Particulate Matter less than 2.5 micron size ($PM_{2.5}$)	IS 5182 (Part 24):2019	$\mu g/m^3$	21.1	60
3	Sulphur Dioxide (SO_2)	IS:5182: Part 02:2001	$\mu g/m^3$	4.6	80
4	Nitrogen Dioxide (NO_2)	IS:5182: Part 06:2006	$\mu g/m^3$	8.2	80
5	Carbon Monoxide (CO)	SARL/IOP/013 (Issue No:01, Issue Date – 01.03.2023)	mg/m^3	BDL (D.L – 1.1)	02

Remarks: Limits: *National Ambient air quality standards from CPCB. BDL- Below detectable limit. DL –Detectable limit.

For Shrient Analytical and Research Labs Pvt. Ltd

Verified 16/12/23

Authorized Signatory 16/12/23

J. GNANAPRAKASAM
Technical Manager

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TEST REPORT

Report No.	SARL/23-115

Report Date.	16.12.2023

Customer Name & Address	Project Name: Thiru R. Natarajan - TOR File No 9971 The proposed quarry of Thiru.R.Natarajan survey nos. 253/7, 259/5, 259/2 and 259/4 over an extent of 2.31.50 Ha, Karadikudi Village, Anaicut Taluk, Vellore District, Tamil Nadu.
Sample Description	AMBIENT AIR QUALITY
Sampling Procedure	IS – 5182 (Part – 14: 2000 & Part – V: Reaffirmed - 2003), CPCB Guide lines

Sample Location	A4-KARADIKUDI
Positioned height of Sampler	1.5 M above Ground Level

Customer Reference	As per work order	Sampling Procedure	24 hrs
Sample Reference No	SARL/A/CHE-115	Sample Received on	11.12.2023
Sample Collected by	LABORATORY	Test Commenced on	11.12.2023
Sample Collected Date	07.12.2023	Test Completed on	16.12.2023
Temperature	31°C	Relative Humidity	54%
Sample Condition	Fit for Analysis		

S. No.	Parameters	Protocol	Unit	Results	*Limits
1	Particulate Matter less than 10 micron size (PM_{10})	IS:5182: Part 23:2006	$\mu g/m^3$	52.2	100
2	Particulate Matter less than 2.5 micron size ($PM_{2.5}$)	IS 5182 (Part 24):2019	$\mu g/m^3$	24.8	60
3	Sulphur Dioxide (SO_2)	IS:5182: Part 02:2001	$\mu g/m^3$	5.8	80
4	Nitrogen Dioxide (NO_2)	IS:5182: Part 06:2006	$\mu g/m^3$	9.7	80
5	Carbon Monoxide (CO)	SARL/IOP/013 (Issue No:01, Issue Date – 01.03.2023)	mg/m^3	BDL (D.L – 1.1)	02

Remarks: Limits: *National Ambient air quality standards from CPCB. BDL- Below detectable limit. DL –Detectable limit.

For Shrient Analytical and Research Labs Pvt. Ltd

Verified 16/12/23

Authorized Signatory

END OF THE REPORT

J. GNANAPRAKASAM
Technical Manager

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For any Technical Issues & Complaints: vinalnath@shrientanalytical.com

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Website : www.shrientanalytical.com

TEST REPORT

Report No.	SARL/23-116

Report Date.	16.12.2023

Customer Name & Address	Project Name: Thiru R. Natarajan - TOR File No 9971 The proposed quarry of Thiru.R.Natarajan survey nos. 253/7, 259/5, 259/2 and 259/4 over an extent of 2.31.50 Ha, Karadikudi Village, Anaicut Taluk, Vellore District, Tamil Nadu.
Sample Description	AMBIENT AIR QUALITY
Sampling Procedure	IS – 5182 (Part – 14: 2000 & Part – V: Reaffirmed - 2003), CPCB Guide lines

Sample Location	A3-PICHANATHAM
Positioned height of Sampler	1.5 M above Ground Level

Customer Reference	As per work order	Sampling Procedure	24 hrs
Sample Reference No	SARL/A/CHE-116	Sample Received on	11.12.2023
Sample Collected by	LABORATORY	Test Commenced on	11.12.2023
Sample Collected Date	08.12.2023	Test Completed on	16.12.2023
Temperature	30°C	Relative Humidity	63%
Sample Condition	Fit for Analysis		

S. No.	Parameters	Protocol	Unit	Results	*Limits
1	Particulate Matter less than 10 micron size (PM_{10})	IS:5182: Part 23:2006	$\mu g/m^3$	46.6	100
2	Particulate Matter less than 2.5 micron size ($PM_{2.5}$)	IS 5182 (Part 24):2019	$\mu g/m^3$	22.3	60
3	Sulphur Dioxide (SO_2)	IS:5182: Part 02:2001	$\mu g/m^3$	5.8	80
4	Nitrogen Dioxide (NO_2)	IS:5182: Part 06:2006	$\mu g/m^3$	7.6	80
5	Carbon Monoxide (CO)	SARL/IOP/013 (Issue No:01, Issue Date – 01.03.2023)	mg/m^3	BDL (D.L – 1.1)	02

Remarks: Limits: *National Ambient air quality standards from CPCB. BDL- Below detectable limit. DL –Detectable limit.

For Shrient Analytical and Research Labs Pvt. Ltd

Verified 16/12/23

Authorized Signatory

END OF THE REPORT

J. GNANAPRAKASAM
Technical Manager

Please Contact:
For any Technical Issues & Complaints: vimalnath@shrientanalytical.com

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Website : www.shrientanalytical.com

TEST REPORT

Report No.	SARL/23-117	Report Date.	16.12.2023

Customer Name & Address	Project Name: Thiru R. Natarajan - TOR File No 9971 The proposed quarry of Thiru.R.Natarajan survey nos. 253/7, 259/5, 259/2 and 259/4 over an extent of 2.31.50 Ha, Karadikudi Village, Anaicut Taluk, Vellore District, Tamil Nadu.
Sample Description	AMBIENT AIR QUALITY
Sampling Procedure	IS – 5182 (Part – 14: 2000 & Part – V: Reaffirmed - 2003), CPCB Guide lines

Sample Location	A4-KARADIKUDI
Positioned height of Sampler	1.5 M above Ground Level

Customer Reference	As per work order	Sampling Procedure	24 hrs
Sample Reference No	SARL/A/CHE-117	Sample Received on	11.12.2023
Sample Collected by	LABORATORY	Test Commenced on	11.12.2023
Sample Collected Date	08.12.2023	Test Completed on	16.12.2023
Temperature	30°C	Relative Humidity	63%
Sample Condition	Fit for Analysis		

S. No.	Parameters	Protocol	Unit	Results	*Limits
1	Particulate Matter less than 10 micron size (PM_{10})	IS:5182: Part 23:2006	$\mu g/m^3$	51.4	100
2	Particulate Matter less than 2.5 micron size ($PM_{2.5}$)	IS 5182 (Part 24):2019	$\mu g/m^3$	23.8	60
3	Sulphur Dioxide (SO_2)	IS:5182: Part 02:2001	$\mu g/m^3$	6.7	80
4	Nitrogen Dioxide (NO_2)	IS:5182: Part 06:2006	$\mu g/m^3$	12.5	80
5	Carbon Monoxide (CO)	SARL/IOP/013 (Issue No:01, Issue Date – 01.03.2023)	mg/m^3	BDL (D.L – 1.1)	02

Remarks: Limits: *National Ambient air quality standards from CPCB. BDL- Below detectable limit. DL –Detectable limit.

For Shrient Analytical and Research Labs Pvt. Ltd

Verified 16/12/23

Authorized Signatory 16/12/23

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J. GNANAPRAKASAM
Technical Manager

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TEST REPORT

Report No.	SARL/23-118	Report Date.	16.12.2023

Customer Name & Address	Project Name: Thiru R. Natarajan - TOR File No 9971 The proposed quarry of Thiru.R.Natarajan survey nos. 253/7, 259/5, 259/2 and 259/4 over an extent of 2.31.50 Ha, Karadikudi Village, Anaicut Taluk, Vellore District, Tamil Nadu.
Sample Description	AMBIENT AIR QUALITY
Sampling Procedure	IS – 5182 (Part – 14: 2000 & Part – V: Reaffirmed - 2003), CPCB Guide lines

Sample Location	A5-ODIYATHUR
Positioned height of Sampler	1.5 M above Ground Level

Customer Reference	As per work order	Sampling Procedure	24 hrs
Sample Reference No	SARL/A/CHE-118	Sample Received on	11.12.2023
Sample Collected by	LABORATORY	Test Commenced on	11.12.2023
Sample Collected Date	09.12.2023	Test Completed on	16.12.2023
Temperature	29°C	Relative Humidity	63%
Sample Condition	Fit for Analysis		

S. No.	Parameters	Protocol	Unit	Results	*Limits
1	Particulate Matter less than 10 micron size (PM_{10})	IS:5182: Part 23:2006	$\mu g/m^3$	47.8	100
2	Particulate Matter less than 2.5 micron size ($PM_{2.5}$)	IS 5182 (Part 24):2019	$\mu g/m^3$	22.0	60
3	Sulphur Dioxide (SO_2)	IS:5182: Part 02:2001	$\mu g/m^3$	6.2	80
4	Nitrogen Dioxide (NO_2)	IS:5182: Part 06:2006	$\mu g/m^3$	9.9	80
5	Carbon Monoxide (CO)	SARL/IOP/013 (Issue No:01, Issue Date – 01.03.2023)	mg/m^3	BDL (D.L – 1.1)	02

Remarks: Limits: *National Ambient air quality standards from CPCB. BDL- Below detectable limit. DL –Detectable limit.

For Shrient Analytical and Research Labs Pvt. Ltd

Verified 16/12/23

Authorized Signatory

J. GNANAPRAKASAM
Technical Manager

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TEST REPORT

Report No.	SARL/23-119

Report Date.	16.12.2023

Customer Name & Address	Project Name: Thiru R. Natarajan - TOR File No 9971 The proposed quarry of Thiru.R.Natarajan survey nos. 253/7, 259/5, 259/2 and 259/4 over an extent of 2.31.50 Ha, Karadikudi Village, Anaicut Taluk, Vellore District, Tamil Nadu.
Sample Description	AMBIENT AIR QUALITY
Sampling Procedure	IS – 5182 (Part – 14: 2000 & Part – V: Reaffirmed - 2003), CPCB Guide lines

Sample Location	A6-ANAICUT
Positioned height of Sampler	1.5 M above Ground Level

Customer Reference	As per work order	Sampling Procedure	24 hrs
Sample Reference No	SARL/A/CHE-119	Sample Received on	11.12.2023
Sample Collected by	LABORATORY	Test Commenced on	11.12.2023
Sample Collected Date	09.12.2023	Test Completed on	16.12.2023
Temperature	29°C	Relative Humidity	63%
Sample Condition	Fit for Analysis		

S. No.	Parameters	Protocol	Unit	Results	*Limits
1	Particulate Matter less than 10 micron size (PM_{10})	IS:5182: Part 23:2006	$\mu g/m^3$	52.5	100
2	Particulate Matter less than 2.5 micron size ($PM_{2.5}$)	IS 5182 (Part 24):2019	$\mu g/m^3$	23.6	60
3	Sulphur Dioxide (SO_2)	IS:5182: Part 02:2001	$\mu g/m^3$	4.7	80
4	Nitrogen Dioxide (NO_2)	IS:5182: Part 06:2006	$\mu g/m^3$	7.1	80
5	Carbon Monoxide (CO)	SARL/IOP/013 (Issue No:01, Issue Date – 01.03.2023)	mg/m^3	BDL (D.L – 1.1)	02

Remarks: Limits: *National Ambient air quality standards from CPCB. BDL- Below detectable limit. DL –Detectable limit.

For Shrient Analytical and Research Labs Pvt. Ltd

Verified 16/12/23

Authorized Signatory

J. GNANAPRAKASAM
Technical Manager

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TEST REPORT

Report No.	SARL/23-120

Report Date.	16.12.2023

Customer Name & Address	Project Name: Thiru R. Natarajan - TOR File No 9971 The proposed quarry of Thiru.R.Natarajan survey nos. 253/7, 259/5, 259/2 and 259/4 over an extent of 2.31.50 Ha, Karadikudi Village, Anaicut Taluk, Vellore District, Tamil Nadu.
Sample Description	AMBIENT AIR QUALITY
Sampling Procedure	IS – 5182 (Part – 14: 2000 & Part – V: Reaffirmed - 2003), CPCB Guide lines

Sample Location	A5-ODIYATHUR
Positioned height of Sampler	1.5 M above Ground Level

Customer Reference	As per work order	Sampling Procedure	24 hrs
Sample Reference No	SARL/A/CHE-120	Sample Received on	11.12.2023
Sample Collected by	LABORATORY	Test Commenced on	11.12.2023
Sample Collected Date	10.12.2023	Test Completed on	16.12.2023
Temperature	29°C	Relative Humidity	62%
Sample Condition	Fit for Analysis		

S. No.	Parameters	Protocol	Unit	Results	*Limits
1	Particulate Matter less than 10 micron size (PM_{10})	IS:5182: Part 23:2006	$\mu g/m^3$	45.9	100
2	Particulate Matter less than 2.5 micron size ($PM_{2.5}$)	IS 5182 (Part 24):2019	$\mu g/m^3$	21.2	60
3	Sulphur Dioxide (SO_2)	IS:5182: Part 02:2001	$\mu g/m^3$	5.8	80
4	Nitrogen Dioxide (NO_2)	IS:5182: Part 06:2006	$\mu g/m^3$	9.1	80
5	Carbon Monoxide (CO)	SARL/IOP/013 (Issue No:01, Issue Date – 01.03.2023)	mg/m^3	BDL (D.L – 1.1)	02

Remarks: Limits: *National Ambient air quality standards from CPCB. BDL- Below detectable limit. DL –Detectable limit.

For Shrient Analytical and Research Labs Pvt. Ltd

Verified 16/12/23

Authorized Signatory 16/12/23

END OF THE REPORT

J. GNANAPRAKASAM
Technical Manager

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TEST REPORT

Report No.	SARL/23-121

Report Date.	16.12.2023

Customer Name & Address	Project Name: Thiru R. Natarajan - TOR File No 9971 The proposed quarry of Thiru.R.Natarajan survey nos. 253/7, 259/5, 259/2 and 259/4 over an extent of 2.31.50 Ha, Karadikudi Village, Anaicut Taluk, Vellore District, Tamil Nadu.
Sample Description	AMBIENT AIR QUALITY
Sampling Procedure	IS – 5182 (Part – 14: 2000 & Part – V: Reaffirmed - 2003), CPCB Guide lines

Sample Location	A6-ANAICUT
Positioned height of Sampler	1.5 M above Ground Level

Customer Reference	As per work order	Sampling Procedure	24 hrs
Sample Reference No	SARL/A/CHE-121	Sample Received on	11.12.2023
Sample Collected by	LABORATORY	Test Commenced on	11.12.2023
Sample Collected Date	10.12.2023	Test Completed on	16.12.2023
Temperature	30°C	Relative Humidity	62%
Sample Condition	Fit for Analysis		

S. No.	Parameters	Protocol	Unit	Results	*Limits
1	Particulate Matter less than 10 micron size (PM_{10})	IS:5182: Part 23:2006	$\mu g/m^3$	55.1	100
2	Particulate Matter less than 2.5 micron size ($PM_{2.5}$)	IS 5182 (Part 24):2019	$\mu g/m^3$	24.7	60
3	Sulphur Dioxide (SO_2)	IS:5182: Part 02:2001	$\mu g/m^3$	4.9	80
4	Nitrogen Dioxide (NO_2)	IS:5182: Part 06:2006	$\mu g/m^3$	7.5	80
5	Carbon Monoxide (CO)	SARL/IOP/013 (Issue No:01, Issue Date – 01.03.2023)	mg/m^3	BDL (D.L – 1.1)	02

Remarks: Limits: *National Ambient air quality standards from CPCB. BDL- Below detectable limit. DL –Detectable limit.

For Shrient Analytical and Research Labs Pvt. Ltd

Verified 16/12/23

Authorized Signatory 16/12/23

J. GNANAPRAKASAM
Technical Manager

END OF THE REPORT

Please Contact:
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TEST REPORT

Report No.	SARL/23-122

Report Date.	23.12.2023

Customer Name & Address	Project Name: Thiru R. Natarajan - TOR File No 9971 The proposed quarry of Thiru.R.Natarajan survey nos. 253/7, 259/5, 259/2 and 259/4 over an extent of 2.31.50 Ha, Karadikudi Village, Anaicut Taluk, Vellore District, Tamil Nadu.
Sample Description	AMBIENT AIR QUALITY
Sampling Procedure	IS – 5182 (Part – 14: 2000 & Part – V: Reaffirmed - 2003), CPCB Guide lines

Sample Location	A5-ODIYATHUR
Positioned height of Sampler	1.5 M above Ground Level

Customer Reference	As per work order	Sampling Procedure	24 hrs
Sample Reference No	SARL/A/CHE-122	Sample Received on	18.12.2023
Sample Collected by	LABORATORY	Test Commenced on	18.12.2023
Sample Collected Date	12.12.2023	Test Completed on	23.12.2023
Temperature	28°C	Relative Humidity	59%
Sample Condition	Fit for Analysis		

S. No.	Parameters	Protocol	Unit	Results	*Limits
1	Particulate Matter less than 10 micron size (PM_{10})	IS:5182: Part 23:2006	$\mu g/m^3$	50.1	100
2	Particulate Matter less than 2.5 micron size ($PM_{2.5}$)	IS 5182 (Part 24):2019	$\mu g/m^3$	22.9	60
3	Sulphur Dioxide (SO_2)	IS:5182: Part 02:2001	$\mu g/m^3$	6.6	80
4	Nitrogen Dioxide (NO_2)	IS:5182: Part 06:2006	$\mu g/m^3$	8.1	80
5	Carbon Monoxide (CO)	SARL/IOP/013 (Issue No:01, Issue Date – 01.03.2023)	mg/m^3	BDL (D.L – 1.1)	02

Remarks: Limits: *National Ambient air quality standards from CPCB. BDL- Below detectable limit. DL –Detectable limit.

For Shrient Analytical and Research Labs Pvt. Ltd

Verified 23/12/23

Authorized Signatory
J. GNANAPRAKASAM
Technical Manager

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TEST REPORT

Report No.	SARL/23-123

Report Date.	23.12.2023

Customer Name & Address	Project Name: Thiru R. Natarajan - TOR File No 9971 The proposed quarry of Thiru.R.Natarajan survey nos. 253/7, 259/5, 259/2 and 259/4 over an extent of 2.31.50 Ha, Karadikudi Village, Anaicut Taluk, Vellore District, Tamil Nadu.
Sample Description	AMBIENT AIR QUALITY
Sampling Procedure	IS – 5182 (Part – 14: 2000 & Part – V: Reaffirmed - 2003), CPCB Guide lines

Sample Location	A6-ANAICUT
Positioned height of Sampler	1.5 M above Ground Level

Customer Reference	As per work order	Sampling Procedure	24 hrs
Sample Reference No	SARL/A/CHE-123	Sample Received on	18.12.2023
Sample Collected by	LABORATORY	Test Commenced on	18.12.2023
Sample Collected Date	12.12.2023	Test Completed on	23.12.2023
Temperature	28°C	Relative Humidity	59%
Sample Condition	Fit for Analysis		

S. No.	Parameters	Protocol	Unit	Results	*Limits
1	Particulate Matter less than 10 micron size (PM_{10})	IS:5182: Part 23:2006	$\mu g/m^3$	51.5	100
2	Particulate Matter less than 2.5 micron size ($PM_{2.5}$)	IS 5182 (Part 24):2019	$\mu g/m^3$	23.2	60
3	Sulphur Dioxide (SO_2)	IS:5182: Part 02:2001	$\mu g/m^3$	4.1	80
4	Nitrogen Dioxide (NO_2)	IS:5182: Part 06:2006	$\mu g/m^3$	6.9	80
5	Carbon Monoxide (CO)	SARL/IOP/013 (Issue No:01, Issue Date – 01.03.2023)	mg/m^3	BDL (D.L – 1.1)	02

Remarks: Limits: *National Ambient air quality standards from CPCB. BDL- Below detectable limit. DL –Detectable limit.

For Shrient Analytical and Research Labs Pvt. Ltd

Verified 23/12/23

Authorized Signatory 23/12/23

J. GNANAPRAKASAM
Technical Manager

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TEST REPORT

Report No.	SARL/23-124

Report Date.	23.12.2023

Customer Name & Address	Project Name: Thiru R. Natarajan - TOR File No 9971 The proposed quarry of Thiru.R.Natarajan survey nos. 253/7, 259/5, 259/2 and 259/4 over an extent of 2.31.50 Ha, Karadikudi Village, Anaicut Taluk, Vellore District, Tamil Nadu.
Sample Description	AMBIENT AIR QUALITY
Sampling Procedure	IS – 5182 (Part – 14: 2000 & Part – V: Reaffirmed - 2003), CPCB Guide lines

Sample Location	A5-ODIYATHUR
Positioned height of Sampler	1.5 M above Ground Level

Customer Reference	As per work order	Sampling Procedure	24 hrs
Sample Reference No	SARL/A/CHE-124	Sample Received on	18.12.2023
Sample Collected by	LABORATORY	Test Commenced on	18.12.2023
Sample Collected Date	13.12.2023	Test Completed on	23.12.2023
Temperature	27°C	Relative Humidity	63%
Sample Condition	Fit for Analysis		

S. No.	Parameters	Protocol	Unit	Results	*Limits
1	Particulate Matter less than 10 micron size (PM_{10})	IS:5182: Part 23:2006	$\mu g/m^3$	48.3	100
2	Particulate Matter less than 2.5 micron size ($PM_{2.5}$)	IS 5182 (Part 24):2019	$\mu g/m^3$	22.3	60
3	Sulphur Dioxide (SO_2)	IS:5182: Part 02:2001	$\mu g/m^3$	6.2	80
4	Nitrogen Dioxide (NO_2)	IS:5182: Part 06:2006	$\mu g/m^3$	9.6	80
5	Carbon Monoxide (CO)	SARL/IOP/013 (Issue No:01, Issue Date – 01.03.2023)	mg/m^3	BDL (D.L – 1.1)	02

Remarks: Limits: *National Ambient air quality standards from CPCB. BDL- Below detectable limit. DL –Detectable limit.

For Shrient Analytical and Research Labs Pvt. Ltd

Verified 23/12/23

23/12/23

Authorized Signatory

J. GNANAPRAKASAM
Technical Manager

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TEST REPORT

Report No.	SARL/23-125

Report Date.	23.12.2023

Customer Name & Address	Project Name: Thiru R. Natarajan - TOR File No 9971 The proposed quarry of Thiru.R.Natarajan survey nos. 253/7, 259/5, 259/2 and 259/4 over an extent of 2.31.50 Ha, Karadikudi Village, Anaicut Taluk, Vellore District, Tamil Nadu.
Sample Description	AMBIENT AIR QUALITY
Sampling Procedure	IS – 5182 (Part – 14: 2000 & Part – V: Reaffirmed - 2003), CPCB Guide lines

Sample Location	A6-ANAICUT
Positioned height of Sampler	1.5 M above Ground Level

Customer Reference	As per work order	Sampling Procedure	24 hrs
Sample Reference No	SARL/A/CHE-125	Sample Received on	18.12.2023
Sample Collected by	LABORATORY	Test Commenced on	18.12.2023
Sample Collected Date	13.12.2023	Test Completed on	23.12.2023
Temperature	27°C	Relative Humidity	63%
Sample Condition	Fit for Analysis		

S. No.	Parameters	Protocol	Unit	Results	*Limits
1	Particulate Matter less than 10 micron size (PM_{10})	IS:5182: Part 23:2006	$\mu g/m^3$	54.1	100
2	Particulate Matter less than 2.5 micron size ($PM_{2.5}$)	IS 5182 (Part 24):2019	$\mu g/m^3$	24.3	60
3	Sulphur Dioxide (SO_2)	IS:5182: Part 02:2001	$\mu g/m^3$	6.5	80
4	Nitrogen Dioxide (NO_2)	IS:5182: Part 06:2006	$\mu g/m^3$	9.5	80
5	Carbon Monoxide (CO)	SARL/IOP/013 (Issue No:01, Issue Date – 01.03.2023)	mg/m^3	BDL (D.L – 1.1)	02

Remarks: Limits: *National Ambient air quality standards from CPCB. BDL- Below detectable limit. DL –Detectable limit.

For Shrient Analytical and Research Labs Pvt. Ltd

Verified 23/12/23

23/12/23

Authorized Signatory

J. GNANAPRAKASAM
Technical Manager

END OF THE REPORT

Please Contact:
For any Technical Issues & Complaints: vimalnath@shrientanalytical.com

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TEST REPORT

Report No.	SARL/23-126

Report Date.	23.12.2023

Customer Name & Address	Project Name: Thiru R. Natarajan - TOR File No 9971 The proposed quarry of Thiru.R.Natarajan survey nos. 253/7, 259/5, 259/2 and 259/4 over an extent of 2.31.50 Ha, Karadikudi Village, Anaicut Taluk, Vellore District, Tamil Nadu.
Sample Description	AMBIENT AIR QUALITY
Sampling Procedure	IS – 5182 (Part – 14: 2000 & Part – V: Reaffirmed - 2003), CPCB Guide lines

Sample Location	A3-PICHANATHAM
Positioned height of Sampler	1.5 M above Ground Level

Customer Reference	As per work order	Sampling Procedure	24 hrs
Sample Reference No	SARL/A/CHE-126	Sample Received on	18.12.2023
Sample Collected by	LABORATORY	Test Commenced on	18.12.2023
Sample Collected Date	14.12.2023	Test Completed on	23.12.2023
Temperature	28°C	Relative Humidity	54%
Sample Condition	Fit for Analysis		

S. No.	Parameters	Protocol	Unit	Results	*Limits
1	Particulate Matter less than 10 micron size (PM_{10})	IS:5182: Part 23:2006	$\mu g/m^3$	41.2	100
2	Particulate Matter less than 2.5 micron size ($PM_{2.5}$)	IS 5182 (Part 24):2019	$\mu g/m^3$	20.5	60
3	Sulphur Dioxide (SO_2)	IS:5182: Part 02:2001	$\mu g/m^3$	5.2	80
4	Nitrogen Dioxide (NO_2)	IS:5182: Part 06:2006	$\mu g/m^3$	7.2	80
5	Carbon Monoxide (CO)	SARL/IOP/013 (Issue No:01, Issue Date – 01.03.2023)	mg/m^3	BDL (D.L – 1.1)	02

Remarks: Limits: *National Ambient air quality standards from CPCB. BDL- Below detectable limit. DL –Detectable limit.

For Shrient Analytical and Research Labs Pvt. Ltd

Verified 23/12/23

Authorized Signatory 23/12/23

J. GNANAPRAKASAM
Technical Manager

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TEST REPORT

Report No.	SARL/23-127	Report Date.	23.12.2023

Customer Name & Address	Project Name: Thiru R. Natarajan - TOR File No 9971 The proposed quarry of Thiru.R.Natarajan survey nos. 253/7, 259/5, 259/2 and 259/4 over an extent of 2.31.50 Ha, Karadikudi Village, Anaicut Taluk, Vellore District, Tamil Nadu.
Sample Description	AMBIENT AIR QUALITY
Sampling Procedure	IS – 5182 (Part – 14: 2000 & Part – V: Reaffirmed - 2003), CPCB Guide lines

Sample Location	A4-KARADIKUDI
Positioned height of Sampler	1.5 M above Ground Level

Customer Reference	As per work order	Sampling Procedure	24 hrs
Sample Reference No	SARL/A/CHE-127	Sample Received on	18.12.2023
Sample Collected by	LABORATORY	Test Commenced on	18.12.2023
Sample Collected Date	14.12.2023	Test Completed on	23.12.2023
Temperature	28°C	Relative Humidity	54%
Sample Condition	Fit for Analysis		

S. No.	Parameters	Protocol	Unit	Results	*Limits
1	Particulate Matter less than 10 micron size (PM_{10})	IS:5182: Part 23:2006	$\mu g/m^3$	56.2	100
2	Particulate Matter less than 2.5 micron size ($PM_{2.5}$)	IS 5182 (Part 24):2019	$\mu g/m^3$	26.7	60
3	Sulphur Dioxide (SO_2)	IS:5182: Part 02:2001	$\mu g/m^3$	6.1	80
4	Nitrogen Dioxide (NO_2)	IS:5182: Part 06:2006	$\mu g/m^3$	10.9	80
5	Carbon Monoxide (CO)	SARL/IOP/013 (Issue No:01, Issue Date – 01.03.2023)	mg/m^3	BDL (D.L – 1.1)	02

Remarks: Limits: *National Ambient air quality standards from CPCB. BDL- Below detectable limit. DL –Detectable limit.

For Shrient Analytical and Research Labs Pvt. Ltd

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Technical Manager

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TEST REPORT

Report No.	SARL/23-128

Report Date.	23.12.2023

Customer Name & Address	Project Name: Thiru R. Natarajan - TOR File No 9971 The proposed quarry of Thiru.R.Natarajan survey nos. 253/7, 259/5, 259/2 and 259/4 over an extent of 2.31.50 Ha, Karadikudi Village, Anaicut Taluk, Vellore District, Tamil Nadu.
Sample Description	AMBIENT AIR QUALITY
Sampling Procedure	IS – 5182 (Part – 14: 2000 & Part – V: Reaffirmed - 2003), CPCB Guide lines

Sample Location	A3-PICHANATHAM
Positioned height of Sampler	1.5 M above Ground Level

Customer Reference	As per work order	Sampling Procedure	24 hrs
Sample Reference No	SARL/A/CHE-128	Sample Received on	18.12.2023
Sample Collected by	LABORATORY	Test Commenced on	18.12.2023
Sample Collected Date	15.12.2023	Test Completed on	23.12.2023
Temperature	24°C	Relative Humidity	76%
Sample Condition	Fit for Analysis		

S. No.	Parameters	Protocol	Unit	Results	*Limits
1	Particulate Matter less than 10 micron size (PM_{10})	IS:5182: Part 23:2006	$\mu g/m^3$	48.5	100
2	Particulate Matter less than 2.5 micron size ($PM_{2.5}$)	IS 5182 (Part 24):2019	$\mu g/m^3$	26.8	60
3	Sulphur Dioxide (SO_2)	IS:5182: Part 02:2001	$\mu g/m^3$	6.4	80
4	Nitrogen Dioxide (NO_2)	IS:5182: Part 06:2006	$\mu g/m^3$	8.3	80
5	Carbon Monoxide (CO)	SARL/IOP/013 (Issue No:01, Issue Date – 01.03.2023)	mg/m^3	BDL (D.L – 1.1)	02

Remarks: Limits: *National Ambient air quality standards from CPCB. BDL- Below detectable limit. DL –Detectable limit.

For Shrient Analytical and Research Labs Pvt. Ltd

Verified 23/12/23

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Technical Manager

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TEST REPORT

Report No.	SARL/23-129	Report Date.	23.12.2023

Customer Name & Address	Project Name: Thiru R. Natarajan - TOR File No 9971 The proposed quarry of Thiru.R.Natarajan survey nos. 253/7, 259/5, 259/2 and 259/4 over an extent of 2.31.50 Ha, Karadikudi Village, Anaicut Taluk, Vellore District, Tamil Nadu.
Sample Description	AMBIENT AIR QUALITY
Sampling Procedure	IS – 5182 (Part – 14: 2000 & Part – V: Reaffirmed - 2003), CPCB Guide lines

Sample Location	A4-KARADIKUDI
Positioned height of Sampler	1.5 M above Ground Level

Customer Reference	As per work order	Sampling Procedure	24 hrs
Sample Reference No	SARL/A/CHE-129	Sample Received on	18.12.2023
Sample Collected by	LABORATORY	Test Commenced on	18.12.2023
Sample Collected Date	15.12.2023	Test Completed on	23.12.2023
Temperature	24°C	Relative Humidity	76%
Sample Condition	Fit for Analysis		

S. No.	Parameters	Protocol	Unit	Results	*Limits
1	Particulate Matter less than 10 micron size (PM_{10})	IS:5182: Part 23:2006	$\mu g/m^3$	53.3	100
2	Particulate Matter less than 2.5 micron size ($PM_{2.5}$)	IS 5182 (Part 24):2019	$\mu g/m^3$	24.8	60
3	Sulphur Dioxide (SO_2)	IS:5182: Part 02:2001	$\mu g/m^3$	8.8	80
4	Nitrogen Dioxide (NO_2)	IS:5182: Part 06:2006	$\mu g/m^3$	11.7	80
5	Carbon Monoxide (CO)	SARL/IOP/013 (Issue No:01, Issue Date – 01.03.2023)	mg/m^3	BDL (D.L – 1.1)	02

Remarks: Limits: *National Ambient air quality standards from CPCB. BDL- Below detectable limit. DL –Detectable limit.

For Shrient Analytical and Research Labs Pvt. Ltd

Verified 23/12/23

Authorized Signatory

J. GNANAPRAKASAM
Technical Manager

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TEST REPORT

Report No.	SARL/23-130

Report Date.	23.12.2023

Customer Name & Address	Project Name: Thiru R. Natarajan - TOR File No 9971 The proposed quarry of Thiru.R.Natarajan survey nos. 253/7, 259/5, 259/2 and 259/4 over an extent of 2.31.50 Ha, Karadikudi Village, Anaicut Taluk, Vellore District, Tamil Nadu.
Sample Description	AMBIENT AIR QUALITY
Sampling Procedure	IS – 5182 (Part – 14: 2000 & Part – V: Reaffirmed - 2003), CPCB Guide lines

Sample Location	A1-WITHIN MINE LEASE AREA
Positioned height of Sampler	1.5 M above Ground Level

Customer Reference	As per work order	Sampling Procedure	24 hrs
Sample Reference No	SARL/A/CHE-130	Sample Received on	18.12.2023
Sample Collected by	LABORATORY	Test Commenced on	18.12.2023
Sample Collected Date	16.12.2023	Test Completed on	23.12.2023
Temperature	29°C	Relative Humidity	58%
Sample Condition	Fit for Analysis		

S. No.	Parameters	Protocol	Unit	Results	*Limits
1	Particulate Matter less than 10 micron size (PM_{10})	IS:5182: Part 23:2006	$\mu g/m^3$	60.9	100
2	Particulate Matter less than 2.5 micron size ($PM_{2.5}$)	IS 5182 (Part 24):2019	$\mu g/m^3$	29.6	60
3	Sulphur Dioxide (SO_2)	IS:5182: Part 02:2001	$\mu g/m^3$	4.4	80
4	Nitrogen Dioxide (NO_2)	IS:5182: Part 06:2006	$\mu g/m^3$	9.3	80
5	Carbon Monoxide (CO)	SARL/IOP/013 (Issue No:01, Issue Date – 01.03.2023)	mg/m^3	BDL (D.L – 1.1)	02

Remarks: Limits: *National Ambient air quality standards from CPCB. BDL- Below detectable limit. DL –Detectable limit.

For Shrient Analytical and Research Labs Pvt. Ltd

Verified 23/12/23

Authorized Signatory 23/12/23

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Technical Manager

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TEST REPORT

Report No.	SARL/23-131	Report Date.	23.12.2023

Customer Name & Address	Project Name: Thiru R. Natarajan - TOR File No 9971 The proposed quarry of Thiru.R.Natarajan survey nos. 253/7, 259/5, 259/2 and 259/4 over an extent of 2.31.50 Ha, Karadikudi Village, Anaicut Taluk, Vellore District, Tamil Nadu.
Sample Description	AMBIENT AIR QUALITY
Sampling Procedure	IS – 5182 (Part – 14: 2000 & Part – V: Reaffirmed - 2003), CPCB Guide lines

Sample Location	A2-THANGAL
Positioned height of Sampler	1.5 M above Ground Level

Customer Reference	As per work order	Sampling Procedure	24 hrs
Sample Reference No	SARL/A/CHE-131	Sample Received on	18.12.2023
Sample Collected by	LABORATORY	Test Commenced on	18.12.2023
Sample Collected Date	16.12.2023	Test Completed on	23.12.2023
Temperature	29°C	Relative Humidity	58%
Sample Condition	Fit for Analysis		

S. No.	Parameters	Protocol	Unit	Results	*Limits
1	Particulate Matter less than 10 micron size (PM_{10})	IS:5182: Part 23:2006	$\mu g/m^3$	52.3	100
2	Particulate Matter less than 2.5 micron size ($PM_{2.5}$)	IS 5182 (Part 24):2019	$\mu g/m^3$	24.9	60
3	Sulphur Dioxide (SO_2)	IS:5182: Part 02:2001	$\mu g/m^3$	4.6	80
4	Nitrogen Dioxide (NO_2)	IS:5182: Part 06:2006	$\mu g/m^3$	7.6	80
5	Carbon Monoxide (CO)	SARL/IOP/013 (Issue No:01, Issue Date – 01.03.2023)	mg/m^3	BDL (D.L – 1.1)	02

Remarks: Limits: *National Ambient air quality standards from CPCB. BDL- Below detectable limit. DL –Detectable limit.

For Shrient Analytical and Research Labs Pvt. Ltd

Verified 23/12/23

Authorized Signatory 23/12/23

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J. GNANAPRAKASAM
Technical Manager

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TEST REPORT

Report No.	SARL/23-132

Report Date.	23.12.2023

Customer Name & Address	Project Name: Thiru R. Natarajan - TOR File No 9971 The proposed quarry of Thiru.R.Natarajan survey nos. 253/7, 259/5, 259/2 and 259/4 over an extent of 2.31.50 Ha, Karadikudi Village, Anaicut Taluk, Vellore District, Tamil Nadu.
Sample Description	AMBIENT AIR QUALITY
Sampling Procedure	IS – 5182 (Part – 14: 2000 & Part – V: Reaffirmed - 2003), CPCB Guide lines

Sample Location	A1-WITHIN MINE LEASE AREA
Positioned height of Sampler	1.5 M above Ground Level

Customer Reference	As per work order	Sampling Procedure	24 hrs
Sample Reference No	SARL/A/CHE-132	Sample Received on	18.12.2023
Sample Collected by	LABORATORY	Test Commenced on	18.12.2023
Sample Collected Date	17.12.2023	Test Completed on	23.12.2023
Temperature	22°C	Relative Humidity	89%
Sample Condition	Fit for Analysis		

S. No.	Parameters	Protocol	Unit	Results	*Limits
1	Particulate Matter less than 10 micron size (PM_{10})	IS:5182: Part 23:2006	$\mu g/m^3$	63.4	100
2	Particulate Matter less than 2.5 micron size ($PM_{2.5}$)	IS 5182 (Part 24):2019	$\mu g/m^3$	28.7	60
3	Sulphur Dioxide (SO_2)	IS:5182: Part 02:2001	$\mu g/m^3$	6.4	80
4	Nitrogen Dioxide (NO_2)	IS:5182: Part 06:2006	$\mu g/m^3$	11.2	80
5	Carbon Monoxide (CO)	SARL/IOP/013 (Issue No:01, Issue Date – 01.03.2023)	mg/m^3	BDL (D.L – 1.1)	02

Remarks: Limits: *National Ambient air quality standards from CPCB. BDL- Below detectable limit. DL –Detectable limit.

For Shrient Analytical and Research Labs Pvt. Ltd

Verified 23/12/23

Authorized Signatory 23/12/23

J. GNANAPRAKASAM
Technical Manager

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TEST REPORT

Report No.	SARL/23-133

Report Date.	23.12.2023

Customer Name & Address	Project Name: Thiru R. Natarajan - TOR File No 9971 The proposed quarry of Thiru.R.Natarajan survey nos. 253/7, 259/5, 259/2 and 259/4 over an extent of 2.31.50 Ha, Karadikudi Village, Anaicut Taluk, Vellore District, Tamil Nadu.
Sample Description	AMBIENT AIR QUALITY
Sampling Procedure	IS – 5182 (Part – 14: 2000 & Part – V: Reaffirmed - 2003), CPCB Guide lines

Sample Location	A2-THANGAL
Positioned height of Sampler	1.5 M above Ground Level

Customer Reference	As per work order	Sampling Procedure	24 hrs
Sample Reference No	SARL/A/CHE-133	Sample Received on	18.12.2023
Sample Collected by	LABORATORY	Test Commenced on	18.12.2023
Sample Collected Date	17.12.2023	Test Completed on	23.12.2023
Temperature	22°C	Relative Humidity	89%
Sample Condition	Fit for Analysis		

S. No.	Parameters	Protocol	Unit	Results	*Limits
1	Particulate Matter less than 10 micron size (PM_{10})	IS:5182: Part 23:2006	$\mu g/m^3$	56.2	100
2	Particulate Matter less than 2.5 micron size ($PM_{2.5}$)	IS 5182 (Part 24):2019	$\mu g/m^3$	25.6	60
3	Sulphur Dioxide (SO_2)	IS:5182: Part 02:2001	$\mu g/m^3$	5.2	80
4	Nitrogen Dioxide (NO_2)	IS:5182: Part 06:2006	$\mu g/m^3$	7.9	80
5	Carbon Monoxide (CO)	SARL/IOP/013 (Issue No:01, Issue Date – 01.03.2023)	mg/m^3	BDL (D.L – 1.1)	02

Remarks: Limits: *National Ambient air quality standards from CPCB. BDL- Below detectable limit. DL –Detectable limit.

For Shrient Analytical and Research Labs Pvt. Ltd

23/12/23

Verified

23/12/23

Authorized Signatory

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Shrient Analytical and Research Labs Pvt. Ltd.

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Website : www.shrientanalytical.com

TEST REPORT

Report No.	SARL/23-134	Report Date.	30.12.2023

Customer Name & Address	Project Name: Thiru R. Natarajan - TOR File No 9971 The proposed quarry of Thiru.R.Natarajan survey nos. 253/7, 259/5, 259/2 and 259/4 over an extent of 2.31.50 Ha, Karadikudi Village, Anaicut Taluk, Vellore District, Tamil Nadu.
Sample Description	AMBIENT AIR QUALITY
Sampling Procedure	IS – 5182 (Part – 14: 2000 & Part – V: Reaffirmed - 2003), CPCB Guide lines

Sample Location	A1-WITHIN MINE LEASE AREA
Positioned height of Sampler	1.5 M above Ground Level

Customer Reference	As per work order	Sampling Procedure	24 hrs
Sample Reference No	SARL/A/CHE-134	Sample Received on	25.12.2023
Sample Collected by	LABORATORY	Test Commenced on	25.12.2023
Sample Collected Date	19.12.2023	Test Completed on	30.12.2023
Temperature	28°C	Relative Humidity	54%
Sample Condition	Fit for Analysis		

S. No.	Parameters	Protocol	Unit	Results	*Limits
1	Particulate Matter less than 10 micron size (PM_{10})	IS:5182: Part 23:2006	$\mu g/m^3$	61.8	100
2	Particulate Matter less than 2.5 micron size ($PM_{2.5}$)	IS 5182 (Part 24):2019	$\mu g/m^3$	30.5	60
3	Sulphur Dioxide (SO_2)	IS:5182: Part 02:2001	$\mu g/m^3$	4.8	80
4	Nitrogen Dioxide (NO_2)	IS:5182: Part 06:2006	$\mu g/m^3$	10.5	80
5	Carbon Monoxide (CO)	SARL/IOP/013 (Issue No:01, Issue Date – 01.03.2023)	mg/m^3	BDL (D.L – 1.1)	02

Remarks: Limits: *National Ambient air quality standards from CPCB. BDL- Below detectable limit. DL –Detectable limit.

For Shrient Analytical and Research Labs Pvt. Ltd

Verified 30/12/23

Authorized Signatory 30/12/23

J. GNANAPRAKASAM
Technical Manager

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Please Contact:
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TEST REPORT

Report No.	SARL/23-135	Report Date.	30.12.2023

Customer Name & Address	Project Name: Thiru R. Natarajan - TOR File No 9971 The proposed quarry of Thiru.R.Natarajan survey nos. 253/7, 259/5, 259/2 and 259/4 over an extent of 2.31.50 Ha, Karadikudi Village, Anaicut Taluk, Vellore District, Tamil Nadu.
Sample Description	AMBIENT AIR QUALITY
Sampling Procedure	IS – 5182 (Part – 14: 2000 & Part – V: Reaffirmed - 2003), CPCB Guide lines

Sample Location	A2-THANGAL
Positioned height of Sampler	1.5 M above Ground Level

Customer Reference	As per work order	Sampling Procedure	24 hrs
Sample Reference No	SARL/A/CHE-135	Sample Received on	25.12.2023
Sample Collected by	LABORATORY	Test Commenced on	25.12.2023
Sample Collected Date	19.12.2023	Test Completed on	30.12.2023
Temperature	28°C	Relative Humidity	54%
Sample Condition	Fit for Analysis		

S. No.	Parameters	Protocol	Unit	Results	*Limits
1	Particulate Matter less than 10 micron size (PM_{10})	IS:5182: Part 23:2006	$\mu g/m^3$	53.4	100
2	Particulate Matter less than 2.5 micron size ($PM_{2.5}$)	IS 5182 (Part 24):2019	$\mu g/m^3$	23.8	60
3	Sulphur Dioxide (SO_2)	IS:5182: Part 02:2001	$\mu g/m^3$	4.2	80
4	Nitrogen Dioxide (NO_2)	IS:5182: Part 06:2006	$\mu g/m^3$	9.1	80
5	Carbon Monoxide (CO)	SARL/IOP/013 (Issue No:01, Issue Date – 01.03.2023)	mg/m^3	BDL (D.L – 1.1)	02

Remarks: Limits: *National Ambient air quality standards from CPCB. BDL- Below detectable limit. DL –Detectable limit.

For Shrient Analytical and Research Labs Pvt. Ltd

Verified 30/12/23

Authorized Signatory

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Technical Manager

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TEST REPORT

Report No.	SARL/23-136	Report Date.	30.12.2023

Customer Name & Address	Project Name: Thiru R. Natarajan - TOR File No 9971 The proposed quarry of Thiru.R.Natarajan survey nos. 253/7, 259/5, 259/2 and 259/4 over an extent of 2.31.50 Ha, Karadikudi Village, Anaicut Taluk, Vellore District, Tamil Nadu.
Sample Description	AMBIENT AIR QUALITY
Sampling Procedure	IS – 5182 (Part – 14: 2000 & Part – V: Reaffirmed - 2003), CPCB Guide lines

Sample Location	A1-WITHIN MINE LEASE AREA
Positioned height of Sampler	1.5 M above Ground Level

Customer Reference	As per work order	Sampling Procedure	24 hrs
Sample Reference No	SARL/A/CHE-136	Sample Received on	25.12.2023
Sample Collected by	LABORATORY	Test Commenced on	25.12.2023
Sample Collected Date	20.12.2023	Test Completed on	30.12.2023
Temperature	24°C	Relative Humidity	76%
Sample Condition	Fit for Analysis		

S. No.	Parameters	Protocol	Unit	Results	*Limits
1	Particulate Matter less than 10 micron size (PM_{10})	IS:5182: Part 23:2006	$\mu g/m^3$	56.5	100
2	Particulate Matter less than 2.5 micron size ($PM_{2.5}$)	IS 5182 (Part 24):2019	$\mu g/m^3$	25.4	60
3	Sulphur Dioxide (SO_2)	IS:5182: Part 02:2001	$\mu g/m^3$	4.1	80
4	Nitrogen Dioxide (NO_2)	IS:5182: Part 06:2006	$\mu g/m^3$	9.8	80
5	Carbon Monoxide (CO)	SARL/IOP/013 (Issue No:01, Issue Date – 01.03.2023)	mg/m^3	BDL (D.L – 1.1)	02

Remarks: Limits: *National Ambient air quality standards from CPCB. BDL- Below detectable limit. DL –Detectable limit.

For Shrient Analytical and Research Labs Pvt. Ltd

Verified 30/12/23

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TEST REPORT

Report No.	SARL/23-137

Report Date.	30.12.2023

Customer Name & Address	Project Name: Thiru R. Natarajan - TOR File No 9971 The proposed quarry of Thiru.R.Natarajan survey nos. 253/7, 259/5, 259/2 and 259/4 over an extent of 2.31.50 Ha, Karadikudi Village, Anaicut Taluk, Vellore District, Tamil Nadu.
Sample Description	AMBIENT AIR QUALITY
Sampling Procedure	IS – 5182 (Part – 14: 2000 & Part – V: Reaffirmed - 2003), CPCB Guide lines

Sample Location	A2-THANGAL
Positioned height of Sampler	1.5 M above Ground Level

Customer Reference	As per work order	Sampling Procedure	24 hrs
Sample Reference No	SARL/A/CHE-137	Sample Received on	25.12.2023
Sample Collected by	LABORATORY	Test Commenced on	25.12.2023
Sample Collected Date	20.12.2023	Test Completed on	30.12.2023
Temperature	24°C	Relative Humidity	76%
Sample Condition	Fit for Analysis		

S. No.	Parameters	Protocol	Unit	Results	*Limits
1	Particulate Matter less than 10 micron size (PM_{10})	IS:5182: Part 23:2006	$\mu g/m^3$	51.7	100
2	Particulate Matter less than 2.5 micron size ($PM_{2.5}$)	IS 5182 (Part 24):2019	$\mu g/m^3$	22.9	60
3	Sulphur Dioxide (SO_2)	IS:5182: Part 02:2001	$\mu g/m^3$	4.1	80
4	Nitrogen Dioxide (NO_2)	IS:5182: Part 06:2006	$\mu g/m^3$	8.6	80
5	Carbon Monoxide (CO)	SARL/IOP/013 (Issue No:01, Issue Date – 01.03.2023)	mg/m^3	BDL (D.L – 1.1)	02

Remarks: Limits: *National Ambient air quality standards from CPCB. BDL- Below detectable limit. DL –Detectable limit.

For Shrient Analytical and Research Labs Pvt. Ltd

Verified 30/12/23

Authorized Signatory

J. GNANAPRAKASAM
Technical Manager

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TEST REPORT

Report No.	SARL/23-138

Report Date.	30.12.2023

Customer Name & Address	Project Name: Thiru R. Natarajan - TOR File No 9971 The proposed quarry of Thiru.R.Natarajan survey nos. 253/7, 259/5, 259/2 and 259/4 over an extent of 2.31.50 Ha, Karadikudi Village, Anaicut Taluk, Vellore District, Tamil Nadu.
Sample Description	AMBIENT AIR QUALITY
Sampling Procedure	IS – 5182 (Part – 14: 2000 & Part – V: Reaffirmed - 2003), CPCB Guide lines

Sample Location	A3-PICHANATHAM
Positioned height of Sampler	1.5 M above Ground Level

Customer Reference	As per work order	Sampling Procedure	24 hrs
Sample Reference No	SARL/A/CHE-138	Sample Received on	25.12.2023
Sample Collected by	LABORATORY	Test Commenced on	25.12.2023
Sample Collected Date	21.12.2023	Test Completed on	30.12.2023
Temperature	29°C	Relative Humidity	58%
Sample Condition	Fit for Analysis		

S. No.	Parameters	Protocol	Unit	Results	*Limits
1	Particulate Matter less than 10 micron size (PM_{10})	IS:5182: Part 23:2006	$\mu g/m^3$	41.1	100
2	Particulate Matter less than 2.5 micron size ($PM_{2.5}$)	IS 5182 (Part 24):2019	$\mu g/m^3$	25.7	60
3	Sulphur Dioxide (SO_2)	IS:5182: Part 02:2001	$\mu g/m^3$	4.1	80
4	Nitrogen Dioxide (NO_2)	IS:5182: Part 06:2006	$\mu g/m^3$	7.4	80
5	Carbon Monoxide (CO)	SARL/IOP/013 (Issue No:01, Issue Date – 01.03.2023)	mg/m^3	BDL (D.L – 1.1)	02

Remarks: Limits: *National Ambient air quality standards from CPCB. BDL- Below detectable limit. DL –Detectable limit.

For Shrient Analytical and Research Labs Pvt. Ltd

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Authorized Signatory

J. GNANAPRAKASAM
Technical Manager

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TEST REPORT

Report No.	SARL/23-139

Report Date.	30.12.2023

Customer Name & Address	Project Name: Thiru R. Natarajan - TOR File No 9971 The proposed quarry of Thiru.R.Natarajan survey nos. 253/7, 259/5, 259/2 and 259/4 over an extent of 2.31.50 Ha, Karadikudi Village, Anaicut Taluk, Vellore District, Tamil Nadu.
Sample Description	AMBIENT AIR QUALITY
Sampling Procedure	IS – 5182 (Part – 14: 2000 & Part – V: Reaffirmed - 2003), CPCB Guide lines

Sample Location	A4-KARADIKUDI
Positioned height of Sampler	1.5 M above Ground Level

Customer Reference	As per work order	Sampling Procedure	24 hrs
Sample Reference No	SARL/A/CHE-139	Sample Received on	25.12.2023
Sample Collected by	LABORATORY	Test Commenced on	25.12.2023
Sample Collected Date	21.12.2023	Test Completed on	30.12.2023
Temperature	29°C	Relative Humidity	58%
Sample Condition	Fit for Analysis		

S. No.	Parameters	Protocol	Unit	Results	*Limits
1	Particulate Matter less than 10 micron size (PM_{10})	IS:5182: Part 23:2006	$\mu g/m^3$	56.1	100
2	Particulate Matter less than 2.5 micron size ($PM_{2.5}$)	IS 5182 (Part 24):2019	$\mu g/m^3$	28.9	60
3	Sulphur Dioxide (SO_2)	IS:5182: Part 02:2001	$\mu g/m^3$	7.6	80
4	Nitrogen Dioxide (NO_2)	IS:5182: Part 06:2006	$\mu g/m^3$	10.1	80
5	Carbon Monoxide (CO)	SARL/IOP/013 (Issue No:01, Issue Date – 01.03.2023)	mg/m^3	BDL (D.L – 1.1)	02

Remarks: Limits: *National Ambient air quality standards from CPCB. BDL- Below detectable limit. DL –Detectable limit.

For Shrient Analytical and Research Labs Pvt. Ltd

Verified 30/12/23

Authorized Signatory

J. GNANAPRAKASAM
Technical Manager

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TEST REPORT

Report No.	SARL/23-140	Report Date.	30.12.2023

Customer Name & Address	Project Name: Thiru R. Natarajan - TOR File No 9971 The proposed quarry of Thiru.R.Natarajan survey nos. 253/7, 259/5, 259/2 and 259/4 over an extent of 2.31.50 Ha, Karadikudi Village, Anaicut Taluk, Vellore District, Tamil Nadu.
Sample Description	AMBIENT AIR QUALITY
Sampling Procedure	IS – 5182 (Part – 14: 2000 & Part – V: Reaffirmed - 2003), CPCB Guide lines

Sample Location	A3-PICHANATHAM
Positioned height of Sampler	1.5 M above Ground Level

Customer Reference	As per work order	Sampling Procedure	24 hrs
Sample Reference No	SARL/A/CHE-140	Sample Received on	25.12.2023
Sample Collected by	LABORATORY	Test Commenced on	25.12.2023
Sample Collected Date	22.12.2023	Test Completed on	30.12.2023
Temperature	22°C	Relative Humidity	89%
Sample Condition	Fit for Analysis		

S. No.	Parameters	Protocol	Unit	Results	*Limits
1	Particulate Matter less than 10 micron size (PM_{10})	IS:5182: Part 23:2006	$\mu g/m^3$	45.4	100
2	Particulate Matter less than 2.5 micron size ($PM_{2.5}$)	IS 5182 (Part 24):2019	$\mu g/m^3$	23.1	60
3	Sulphur Dioxide (SO_2)	IS:5182: Part 02:2001	$\mu g/m^3$	4.4	80
4	Nitrogen Dioxide (NO_2)	IS:5182: Part 06:2006	$\mu g/m^3$	6.6	80
5	Carbon Monoxide (CO)	SARL/IOP/013 (Issue No:01, Issue Date – 01.03.2023)	mg/m^3	BDL (D.L – 1.1)	02

Remarks: Limits: *National Ambient air quality standards from CPCB. BDL- Below detectable limit. DL –Detectable limit.

For Shrient Analytical and Research Labs Pvt. Ltd

Verified 30/12/23

Authorized Signatory 30/12/23

END OF THE REPORT

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J. GNANAPRAKASAM
Technical Manager

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TEST REPORT

Report No.	SARL/23-141

Report Date.	30.12.2023

Customer Name & Address	Project Name: Thiru R. Natarajan - TOR File No 9971 The proposed quarry of Thiru.R.Natarajan survey nos. 253/7, 259/5, 259/2 and 259/4 over an extent of 2.31.50 Ha, Karadikudi Village, Anaicut Taluk, Vellore District, Tamil Nadu.
Sample Description	AMBIENT AIR QUALITY
Sampling Procedure	IS – 5182 (Part – 14: 2000 & Part – V: Reaffirmed - 2003), CPCB Guide lines

Sample Location	A4-KARADIKUDI
Positioned height of Sampler	1.5 M above Ground Level

Customer Reference	As per work order	Sampling Procedure	24 hrs
Sample Reference No	SARL/A/CHE-141	Sample Received on	25.12.2023
Sample Collected by	LABORATORY	Test Commenced on	25.12.2023
Sample Collected Date	22.12.2023	Test Completed on	30.12.2023
Temperature	22°C	Relative Humidity	89%
Sample Condition	Fit for Analysis		

S. No.	Parameters	Protocol	Unit	Results	*Limits
1	Particulate Matter less than 10 micron size (PM_{10})	IS:5182: Part 23:2006	$\mu g/m^3$	51.6	100
2	Particulate Matter less than 2.5 micron size ($PM_{2.5}$)	IS 5182 (Part 24):2019	$\mu g/m^3$	25.6	60
3	Sulphur Dioxide (SO_2)	IS:5182: Part 02:2001	$\mu g/m^3$	6.4	80
4	Nitrogen Dioxide (NO_2)	IS:5182: Part 06:2006	$\mu g/m^3$	10.7	80
5	Carbon Monoxide (CO)	SARL/IOP/013 (Issue No:01, Issue Date – 01.03.2023)	mg/m^3	BDL (D.L – 1.1)	02

Remarks: Limits: *National Ambient air quality standards from CPCB. BDL- Below detectable limit. DL –Detectable limit.

For Shrient Analytical and Research Labs Pvt. Ltd

Verified 30/12/23

Authorized Signatory 30/12/23

J. GNANAPRAKASAM
Technical Manager

END OF THE REPORT

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TEST REPORT

Report No.	SARL/23-142

Report Date.	30.12.2023

Customer Name & Address	Project Name: Thiru R. Natarajan - TOR File No 9971 The proposed quarry of Thiru.R.Natarajan survey nos. 253/7, 259/5, 259/2 and 259/4 over an extent of 2.31.50 Ha, Karadikudi Village, Anaicut Taluk, Vellore District, Tamil Nadu.
Sample Description	AMBIENT AIR QUALITY
Sampling Procedure	IS – 5182 (Part – 14: 2000 & Part – V: Reaffirmed - 2003), CPCB Guide lines

Sample Location	A5-ODIYATHUR
Positioned height of Sampler	1.5 M above Ground Level

Customer Reference	As per work order	Sampling Procedure	24 hrs
Sample Reference No	SARL/A/CHE-142	Sample Received on	25.12.2023
Sample Collected by	LABORATORY	Test Commenced on	25.12.2023
Sample Collected Date	23.12.2023	Test Completed on	30.12.2023
Temperature	25°C	Relative Humidity	72%
Sample Condition	Fit for Analysis		

S. No.	Parameters	Protocol	Unit	Results	*Limits
1	Particulate Matter less than 10 micron size (PM_{10})	IS:5182: Part 23:2006	$\mu g/m^3$	53.2	100
2	Particulate Matter less than 2.5 micron size ($PM_{2.5}$)	IS 5182 (Part 24):2019	$\mu g/m^3$	24.5	60
3	Sulphur Dioxide (SO_2)	IS:5182: Part 02:2001	$\mu g/m^3$	5.1	80
4	Nitrogen Dioxide (NO_2)	IS:5182: Part 06:2006	$\mu g/m^3$	8.7	80
5	Carbon Monoxide (CO)	SARL/IOP/013 (Issue No:01, Issue Date – 01.03.2023)	mg/m^3	BDL (D.L – 1.1)	02

Remarks: Limits: *National Ambient air quality standards from CPCB. BDL- Below detectable limit. DL –Detectable limit.

For Shrient Analytical and Research Labs Pvt. Ltd

Verified 30/12/23

Authorized Signatory 30/12/23

J. GNANAPRAKASAM
Technical Manager

END OF THE REPORT

Please Contact:
For any Technical Issues & Complaints: vimalnath@shrientanalytical.com

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Website : www.shrientanalytical.com

TEST REPORT

Report No.	SARL/23-143

Report Date.	30.12.2023

Customer Name & Address	Project Name: Thiru R. Natarajan - TOR File No 9971 The proposed quarry of Thiru.R.Natarajan survey nos. 253/7, 259/5, 259/2 and 259/4 over an extent of 2.31.50 Ha, Karadikudi Village, Anaicut Taluk, Vellore District, Tamil Nadu.
Sample Description	AMBIENT AIR QUALITY
Sampling Procedure	IS – 5182 (Part – 14: 2000 & Part – V: Reaffirmed - 2003), CPCB Guide lines

Sample Location	A6-ANAICUT
Positioned height of Sampler	1.5 M above Ground Level

Customer Reference	As per work order	Sampling Procedure	24 hrs
Sample Reference No	SARL/A/CHE-143	Sample Received on	25.12.2023
Sample Collected by	LABORATORY	Test Commenced on	25.12.2023
Sample Collected Date	23.12.2023	Test Completed on	30.12.2023
Temperature	25°C	Relative Humidity	72%
Sample Condition	Fit for Analysis		

S. No.	Parameters	Protocol	Unit	Results	*Limits
1	Particulate Matter less than 10 micron size (PM_{10})	IS:5182: Part 23:2006	$\mu g/m^3$	52.5	100
2	Particulate Matter less than 2.5 micron size ($PM_{2.5}$)	IS 5182 (Part 24):2019	$\mu g/m^3$	23.6	60
3	Sulphur Dioxide (SO_2)	IS:5182: Part 02:2001	$\mu g/m^3$	4.7	80
4	Nitrogen Dioxide (NO_2)	IS:5182: Part 06:2006	$\mu g/m^3$	8.1	80
5	Carbon Monoxide (CO)	SARL/IOP/013 (Issue No:01, Issue Date – 01.03.2023)	mg/m^3	BDL (D.L – 1.1)	02

Remarks: Limits: *National Ambient air quality standards from CPCB. BDL- Below detectable limit. DL –Detectable limit.

For Shrient Analytical and Research Labs Pvt. Ltd

Verified 30/12/23

Authorized Signatory

J. GNANAPRAKASAM
Technical Manager

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TEST REPORT

Report No.	SARL/23-144	Report Date.	30.12.2023

Customer Name & Address	Project Name: Thiru R. Natarajan - TOR File No 9971 The proposed quarry of Thiru.R.Natarajan survey nos. 253/7, 259/5, 259/2 and 259/4 over an extent of 2.31.50 Ha, Karadikudi Village, Anaicut Taluk, Vellore District, Tamil Nadu.
Sample Description	AMBIENT AIR QUALITY
Sampling Procedure	IS – 5182 (Part – 14: 2000 & Part – V: Reaffirmed - 2003), CPCB Guide lines

Sample Location	A5-ODIYATHUR
Positioned height of Sampler	1.5 M above Ground Level

Customer Reference	As per work order	Sampling Procedure	24 hrs
Sample Reference No	SARL/A/CHE-144	Sample Received on	25.12.2023
Sample Collected by	LABORATORY	Test Commenced on	25.12.2023
Sample Collected Date	24.12.2023	Test Completed on	30.12.2023
Temperature	27°C	Relative Humidity	62%
Sample Condition	Fit for Analysis		

S. No.	Parameters	Protocol	Unit	Results	*Limits
1	Particulate Matter less than 10 micron size (PM_{10})	IS:5182: Part 23:2006	$\mu g/m^3$	59.3	100
2	Particulate Matter less than 2.5 micron size ($PM_{2.5}$)	IS 5182 (Part 24):2019	$\mu g/m^3$	27.1	60
3	Sulphur Dioxide (SO_2)	IS:5182: Part 02:2001	$\mu g/m^3$	5.8	80
4	Nitrogen Dioxide (NO_2)	IS:5182: Part 06:2006	$\mu g/m^3$	9.1	80
5	Carbon Monoxide (CO)	SARL/IOP/013 (Issue No:01, Issue Date – 01.03.2023)	mg/m^3	BDL (D.L – 1.1)	02

Remarks: Limits: *National Ambient air quality standards from CPCB. BDL- Below detectable limit. DL –Detectable limit.

For Shrient Analytical and Research Labs Pvt. Ltd

Verified 30/12/23

Authorized Signatory

J. GNANAPRAKASAM
Technical Manager

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TEST REPORT

Report No.	SARL/23-145

Report Date.	30.12.2023

Customer Name & Address	Project Name: Thiru R. Natarajan - TOR File No 9971 The proposed quarry of Thiru.R.Natarajan survey nos. 253/7, 259/5, 259/2 and 259/4 over an extent of 2.31.50 Ha, Karadikudi Village, Anaicut Taluk, Vellore District, Tamil Nadu.
Sample Description	AMBIENT AIR QUALITY
Sampling Procedure	IS – 5182 (Part – 14: 2000 & Part – V: Reaffirmed - 2003), CPCB Guide lines

Sample Location	A6-ANAICUT
Positioned height of Sampler	1.5 M above Ground Level

Customer Reference	As per work order	Sampling Procedure	24 hrs
Sample Reference No	SARL/A/CHE-145	Sample Received on	25.12.2023
Sample Collected by	LABORATORY	Test Commenced on	25.12.2023
Sample Collected Date	24.12.2023	Test Completed on	30.12.2023
Temperature	27°C	Relative Humidity	62%
Sample Condition	Fit for Analysis		

S. No.	Parameters	Protocol	Unit	Results	*Limits
1	Particulate Matter less than 10 micron size (PM_{10})	IS:5182: Part 23:2006	$\mu g/m^3$	47.2	100
2	Particulate Matter less than 2.5 micron size ($PM_{2.5}$)	IS 5182 (Part 24):2019	$\mu g/m^3$	21.2	60
3	Sulphur Dioxide (SO_2)	IS:5182: Part 02:2001	$\mu g/m^3$	4.3	80
4	Nitrogen Dioxide (NO_2)	IS:5182: Part 06:2006	$\mu g/m^3$	7.4	80
5	Carbon Monoxide (CO)	SARL/IOP/013 (Issue No:01, Issue Date – 01.03.2023)	mg/m^3	BDL (D.L – 1.1)	02

Remarks: Limits: *National Ambient air quality standards from CPCB. BDL- Below detectable limit. DL –Detectable limit.

For Shrient Analytical and Research Labs Pvt. Ltd

Verified 30/12/23

28/12/23

Authorized Signatory

J. GNANAPRAKASAM
Technical Manager

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TEST REPORT

Report No.	SARL/23-146

Report Date.	06.01.2024

Customer Name & Address	Project Name: Thiru R. Natarajan - TOR File No 9971 The proposed quarry of Thiru.R.Natarajan survey nos. 253/7, 259/5, 259/2 and 259/4 over an extent of 2.31.50 Ha, Karadikudi Village, Anaicut Taluk, Vellore District, Tamil Nadu.
Sample Description	AMBIENT AIR QUALITY
Sampling Procedure	IS – 5182 (Part – 14: 2000 & Part – V: Reaffirmed - 2003), CPCB Guide lines

Sample Location	A5-ODIYATHUR
Positioned height of Sampler	1.5 M above Ground Level

Customer Reference	As per work order	Sampling Procedure	24 hrs
Sample Reference No	SARL/A/CHE-146	Sample Received on	01.01.2024
Sample Collected by	LABORATORY	Test Commenced on	01.01.2024
Sample Collected Date	26.12.2023	Test Completed on	06.01.2024
Temperature	28°C	Relative Humidity	60%
Sample Condition	Fit for Analysis		

S. No.	Parameters	Protocol	Unit	Results	*Limits
1	Particulate Matter less than 10 micron size (PM_{10})	IS:5182: Part 23:2006	$\mu g/m^3$	55.2	100
2	Particulate Matter less than 2.5 micron size ($PM_{2.5}$)	IS 5182 (Part 24):2019	$\mu g/m^3$	25.4	60
3	Sulphur Dioxide (SO_2)	IS:5182: Part 02:2001	$\mu g/m^3$	5.6	80
4	Nitrogen Dioxide (NO_2)	IS:5182: Part 06:2006	$\mu g/m^3$	8.3	80
5	Carbon Monoxide (CO)	SARL/IOP/013 (Issue No:01, Issue Date – 01.03.2023)	mg/m^3	BDL (D.L – 1.1)	02

Remarks: Limits: *National Ambient air quality standards from CPCB. BDL- Below detectable limit. DL –Detectable limit.

For Shrient Analytical and Research Labs Pvt. Ltd

Verified 06/01/24

06/01/24

Authorized Signatory
J. GNANAPRAKASAM
Technical Manager

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TEST REPORT

Report No.	SARL/23-147

Report Date.	06.01.2024

Customer Name & Address	Project Name: Thiru R. Natarajan - TOR File No 9971 The proposed quarry of Thiru.R.Natarajan survey nos. 253/7, 259/5, 259/2 and 259/4 over an extent of 2.31.50 Ha, Karadikudi Village, Anaicut Taluk, Vellore District, Tamil Nadu.
Sample Description	AMBIENT AIR QUALITY
Sampling Procedure	IS – 5182 (Part – 14: 2000 & Part – V: Reaffirmed - 2003), CPCB Guide lines

Sample Location	A6-ANAICUT
Positioned height of Sampler	1.5 M above Ground Level

Customer Reference	As per work order	Sampling Procedure	24 hrs
Sample Reference No	SARL/A/CHE-147	Sample Received on	01.01.2024
Sample Collected by	LABORATORY	Test Commenced on	01.01.2024
Sample Collected Date	26.12.2023	Test Completed on	06.01.2024
Temperature	28°C	Relative Humidity	60%
Sample Condition	Fit for Analysis		

S. No.	Parameters	Protocol	Unit	Results	*Limits
1	Particulate Matter less than 10 micron size (PM_{10})	IS:5182: Part 23:2006	$\mu g/m^3$	53.3	100
2	Particulate Matter less than 2.5 micron size ($PM_{2.5}$)	IS 5182 (Part 24):2019	$\mu g/m^3$	23.9	60
3	Sulphur Dioxide (SO_2)	IS:5182: Part 02:2001	$\mu g/m^3$	4.1	80
4	Nitrogen Dioxide (NO_2)	IS:5182: Part 06:2006	$\mu g/m^3$	6.7	80
5	Carbon Monoxide (CO)	SARL/IOP/013 (Issue No:01, Issue Date – 01.03.2023)	mg/m^3	BDL (D.L – 1.1)	02

Remarks: Limits: *National Ambient air quality standards from CPCB. BDL- Below detectable limit. DL –Detectable limit.

For Shrient Analytical and Research Labs Pvt. Ltd

Verified 06/01/24

Authorized Signatory
J. GNANAPRAKASAM
Technical Manager

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TEST REPORT

Report No.	SARL/23-148

Report Date.	06.01.2024

Customer Name & Address	Project Name: Thiru R. Natarajan - TOR File No 9971 The proposed quarry of Thiru.R.Natarajan survey nos. 253/7, 259/5, 259/2 and 259/4 over an extent of 2.31.50 Ha, Karadikudi Village, Anaicut Taluk, Vellore District, Tamil Nadu.
Sample Description	AMBIENT AIR QUALITY
Sampling Procedure	IS – 5182 (Part – 14: 2000 & Part – V: Reaffirmed - 2003), CPCB Guide lines

Sample Location	A5-ODIYATHUR
Positioned height of Sampler	1.5 M above Ground Level

Customer Reference	As per work order	Sampling Procedure	24 hrs
Sample Reference No	SARL/A/CHE-148	Sample Received on	01.01.2024
Sample Collected by	LABORATORY	Test Commenced on	01.01.2024
Sample Collected Date	27.12.2023	Test Completed on	06.01.2024
Temperature	28°C	Relative Humidity	57%
Sample Condition	Fit for Analysis		

S. No.	Parameters	Protocol	Unit	Results	*Limits
1	Particulate Matter less than 10 micron size (PM_{10})	IS:5182: Part 23:2006	$\mu g/m^3$	51.1	100
2	Particulate Matter less than 2.5 micron size ($PM_{2.5}$)	IS 5182 (Part 24):2019	$\mu g/m^3$	23.5	60
3	Sulphur Dioxide (SO_2)	IS:5182: Part 02:2001	$\mu g/m^3$	6.6	80
4	Nitrogen Dioxide (NO_2)	IS:5182: Part 06:2006	$\mu g/m^3$	8.3	80
5	Carbon Monoxide (CO)	SARL/IOP/013 (Issue No:01, Issue Date – 01.03.2023)	mg/m^3	BDL (D.L – 1.1)	02

Remarks: Limits: *National Ambient air quality standards from CPCB. BDL- Below detectable limit. DL –Detectable limit.

For Shrient Analytical and Research Labs Pvt. Ltd

Verified 06/01/24

Authorized Signatory 06/01/24

J. GNANAPRAKASAM
Technical Manager

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TEST REPORT

Report No.	SARL/23-149	Report Date.	06.01.2024

Customer Name & Address	Project Name: Thiru R. Natarajan - TOR File No 9971 The proposed quarry of Thiru.R.Natarajan survey nos. 253/7, 259/5, 259/2 and 259/4 over an extent of 2.31.50 Ha, Karadikudi Village, Anaicut Taluk, Vellore District, Tamil Nadu.
Sample Description	AMBIENT AIR QUALITY
Sampling Procedure	IS – 5182 (Part – 14: 2000 & Part – V: Reaffirmed - 2003), CPCB Guide lines

Sample Location	A6-ANAICUT
Positioned height of Sampler	1.5 M above Ground Level

Customer Reference	As per work order	Sampling Procedure	24 hrs
Sample Reference No	SARL/A/CHE-149	Sample Received on	01.01.2024
Sample Collected by	LABORATORY	Test Commenced on	01.01.2024
Sample Collected Date	27.12.2023	Test Completed on	06.01.2024
Temperature	28°C	Relative Humidity	57%
Sample Condition	Fit for Analysis		

S. No.	Parameters	Protocol	Unit	Results	*Limits
1	Particulate Matter less than 10 micron size (PM_{10})	IS:5182: Part 23:2006	$\mu g/m^3$	55.2	100
2	Particulate Matter less than 2.5 micron size ($PM_{2.5}$)	IS 5182 (Part 24):2019	$\mu g/m^3$	24.8	60
3	Sulphur Dioxide (SO_2)	IS:5182: Part 02:2001	$\mu g/m^3$	4.6	80
4	Nitrogen Dioxide (NO_2)	IS:5182: Part 06:2006	$\mu g/m^3$	7.3	80
5	Carbon Monoxide (CO)	SARL/IOP/013 (Issue No:01, Issue Date – 01.03.2023)	mg/m^3	BDL (D.L – 1.1)	02

Remarks: Limits: *National Ambient air quality standards from CPCB. BDL- Below detectable limit. DL –Detectable limit.

For Shrient Analytical and Research Labs Pvt. Ltd

Verified 06/01/24

Authorized Signatory 06/01/24

J. GNANAPRAKASAM
Technical Manager

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Please Contact:
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TEST REPORT

Report No.	SARL/23-150	Report Date.	06.01.2024

Customer Name & Address	Project Name: Thiru R. Natarajan - TOR File No 9971 The proposed quarry of Thiru.R.Natarajan survey nos. 253/7, 259/5, 259/2 and 259/4 over an extent of 2.31.50 Ha, Karadikudi Village, Anaicut Taluk, Vellore District, Tamil Nadu.
Sample Description	AMBIENT AIR QUALITY
Sampling Procedure	IS – 5182 (Part – 14: 2000 & Part – V: Reaffirmed - 2003), CPCB Guide lines

Sample Location	A3-PICHANATHAM
Positioned height of Sampler	1.5 M above Ground Level

Customer Reference	As per work order	Sampling Procedure	24 hrs
Sample Reference No	SARL/A/CHE-150	Sample Received on	01.01.2024
Sample Collected by	LABORATORY	Test Commenced on	01.01.2024
Sample Collected Date	28.12.2023	Test Completed on	06.01.2024
Temperature	27°C	Relative Humidity	66%
Sample Condition	Fit for Analysis		

S. No.	Parameters	Protocol	Unit	Results	*Limits
1	Particulate Matter less than 10 micron size (PM_{10})	IS:5182: Part 23:2006	$\mu g/m^3$	43.7	100
2	Particulate Matter less than 2.5 micron size ($PM_{2.5}$)	IS 5182 (Part 24):2019	$\mu g/m^3$	20.4	60
3	Sulphur Dioxide (SO_2)	IS:5182: Part 02:2001	$\mu g/m^3$	5.2	80
4	Nitrogen Dioxide (NO_2)	IS:5182: Part 06:2006	$\mu g/m^3$	6.9	80
5	Carbon Monoxide (CO)	SARL/IOP/013 (Issue No:01, Issue Date – 01.03.2023)	mg/m^3	BDL (D.L – 1.1)	02

Remarks: Limits: *National Ambient air quality standards from CPCB. BDL- Below detectable limit. DL –Detectable limit.

For Shrient Analytical and Research Labs Pvt. Ltd

Verified 06/01/24

Authorized Signatory 06/01/24

J. GNANAPRAKASAM
Technical Manager

END OF THE REPORT

Please Contact:
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TEST REPORT

Report No.	SARL/23-151

Report Date.	06.01.2024

Customer Name & Address	Project Name: Thiru R. Natarajan - TOR File No 9971 The proposed quarry of Thiru.R.Natarajan survey nos. 253/7, 259/5, 259/2 and 259/4 over an extent of 2.31.50 Ha, Karadikudi Village, Anaicut Taluk, Vellore District, Tamil Nadu.
Sample Description	AMBIENT AIR QUALITY
Sampling Procedure	IS – 5182 (Part – 14: 2000 & Part – V: Reaffirmed - 2003), CPCB Guide lines

Sample Location	A4-KARADIKUDI
Positioned height of Sampler	1.5 M above Ground Level

Customer Reference	As per work order	Sampling Procedure	24 hrs
Sample Reference No	SARL/A/CHE-151	Sample Received on	01.01.2024
Sample Collected by	LABORATORY	Test Commenced on	01.01.2024
Sample Collected Date	28.12.2023	Test Completed on	06.01.2024
Temperature	27°C	Relative Humidity	66%
Sample Condition	Fit for Analysis		

S. No.	Parameters	Protocol	Unit	Results	*Limits
1	Particulate Matter less than 10 micron size (PM_{10})	IS:5182: Part 23:2006	$\mu g/m^3$	54.7	100
2	Particulate Matter less than 2.5 micron size ($PM_{2.5}$)	IS 5182 (Part 24):2019	$\mu g/m^3$	27.8	60
3	Sulphur Dioxide (SO_2)	IS:5182: Part 02:2001	$\mu g/m^3$	6.2	80
4	Nitrogen Dioxide (NO_2)	IS:5182: Part 06:2006	$\mu g/m^3$	9.1	80
5	Carbon Monoxide (CO)	SARL/IOP/013 (Issue No:01, Issue Date – 01.03.2023)	mg/m^3	BDL (D.L – 1.1)	02

Remarks: Limits: *National Ambient air quality standards from CPCB. BDL- Below detectable limit. DL –Detectable limit.

For Shrient Analytical and Research Labs Pvt. Ltd

Verified 06/01/24

Authorized Signatory 06/01/24

J. GNANAPRAKASAM
Technical Manager

END OF THE REPORT

Please Contact:
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TEST REPORT

Report No.	SARL/23-152

Report Date.	06.01.2024

Customer Name & Address	Project Name: Thiru R. Natarajan - TOR File No 9971 The proposed quarry of Thiru.R.Natarajan survey nos. 253/7, 259/5, 259/2 and 259/4 over an extent of 2.31.50 Ha, Karadikudi Village, Anaicut Taluk, Vellore District, Tamil Nadu.
Sample Description	AMBIENT AIR QUALITY
Sampling Procedure	IS – 5182 (Part – 14: 2000 & Part – V: Reaffirmed - 2003), CPCB Guide lines

Sample Location	A3-PICHANATHAM
Positioned height of Sampler	1.5 M above Ground Level

Customer Reference	As per work order	Sampling Procedure	24 hrs
Sample Reference No	SARL/A/CHE-152	Sample Received on	01.01.2024
Sample Collected by	LABORATORY	Test Commenced on	01.01.2024
Sample Collected Date	29.12.2023	Test Completed on	06.01.2024
Temperature	29°C	Relative Humidity	58%
Sample Condition	Fit for Analysis		

S. No.	Parameters	Protocol	Unit	Results	*Limits
1	Particulate Matter less than 10 micron size (PM_{10})	IS:5182: Part 23:2006	$\mu g/m^3$	44.1	100
2	Particulate Matter less than 2.5 micron size ($PM_{2.5}$)	IS 5182 (Part 24):2019	$\mu g/m^3$	24.2	60
3	Sulphur Dioxide (SO_2)	IS:5182: Part 02:2001	$\mu g/m^3$	4.4	80
4	Nitrogen Dioxide (NO_2)	IS:5182: Part 06:2006	$\mu g/m^3$	7.2	80
5	Carbon Monoxide (CO)	SARL/IOP/013 (Issue No:01, Issue Date – 01.03.2023)	mg/m^3	BDL (D.L – 1.1)	02

Remarks: Limits: *National Ambient air quality standards from CPCB. BDL- Below detectable limit. DL –Detectable limit.

For Shrient Analytical and Research Labs Pvt. Ltd

Verified 06/01/24

Authorized Signatory
J. GNANAPRAKASAM
Technical Manager

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TEST REPORT

Report No.	SARL/23-153	Report Date.	06.01.2024

Customer Name & Address	Project Name: Thiru R. Natarajan - TOR File No 9971 The proposed quarry of Thiru.R.Natarajan survey nos. 253/7, 259/5, 259/2 and 259/4 over an extent of 2.31.50 Ha, Karadikudi Village, Anaicut Taluk, Vellore District, Tamil Nadu.
Sample Description	AMBIENT AIR QUALITY
Sampling Procedure	IS – 5182 (Part – 14: 2000 & Part – V: Reaffirmed - 2003), CPCB Guide lines

Sample Location	A4-KARADIKUDI
Positioned height of Sampler	1.5 M above Ground Level

Customer Reference	As per work order	Sampling Procedure	24 hrs
Sample Reference No	SARL/A/CHE-153	Sample Received on	01.01.2024
Sample Collected by	LABORATORY	Test Commenced on	01.01.2024
Sample Collected Date	29.12.2023	Test Completed on	06.01.2024
Temperature	29°C	Relative Humidity	58%
Sample Condition	Fit for Analysis		

S. No.	Parameters	Protocol	Unit	Results	*Limits
1	Particulate Matter less than 10 micron size (PM_{10})	IS:5182: Part 23:2006	$\mu g/m^3$	49.4	100
2	Particulate Matter less than 2.5 micron size ($PM_{2.5}$)	IS 5182 (Part 24):2019	$\mu g/m^3$	23.7	60
3	Sulphur Dioxide (SO_2)	IS:5182: Part 02:2001	$\mu g/m^3$	5.6	80
4	Nitrogen Dioxide (NO_2)	IS:5182: Part 06:2006	$\mu g/m^3$	9.9	80
5	Carbon Monoxide (CO)	SARL/IOP/013 (Issue No:01, Issue Date – 01.03.2023)	mg/m^3	BDL (D.L – 1.1)	02

Remarks: Limits: *National Ambient air quality standards from CPCB. BDL- Below detectable limit. DL –Detectable limit.

For Shrient Analytical and Research Labs Pvt. Ltd

Verified 06/01/24

Authorized Signatory

J. GNANAPRAKASAM
Technical Manager

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TEST REPORT

Report No.	SARL/23-154	Report Date.	06.01.2024

Customer Name & Address	Project Name: Thiru R. Natarajan - TOR File No 9971 The proposed quarry of Thiru.R.Natarajan survey nos. 253/7, 259/5, 259/2 and 259/4 over an extent of 2.31.50 Ha, Karadikudi Village, Anaicut Taluk, Vellore District, Tamil Nadu.
Sample Description	AMBIENT AIR QUALITY
Sampling Procedure	IS – 5182 (Part – 14: 2000 & Part – V: Reaffirmed - 2003), CPCB Guide lines

Sample Location	A1-WITHIN MINE LEASE AREA
Positioned height of Sampler	1.5 M above Ground Level

Customer Reference	As per work order	Sampling Procedure	24 hrs
Sample Reference No	SARL/A/CHE-154	Sample Received on	01.01.2024
Sample Collected by	LABORATORY	Test Commenced on	01.01.2024
Sample Collected Date	30.12.2023	Test Completed on	06.01.2024
Temperature	28°C	Relative Humidity	57%
Sample Condition	Fit for Analysis		

S. No.	Parameters	Protocol	Unit	Results	*Limits
1	Particulate Matter less than 10 micron size (PM_{10})	IS:5182: Part 23:2006	$\mu g/m^3$	62.6	100
2	Particulate Matter less than 2.5 micron size ($PM_{2.5}$)	IS 5182 (Part 24):2019	$\mu g/m^3$	28.7	60
3	Sulphur Dioxide (SO_2)	IS:5182: Part 02:2001	$\mu g/m^3$	4.4	80
4	Nitrogen Dioxide (NO_2)	IS:5182: Part 06:2006	$\mu g/m^3$	9.1	80
5	Carbon Monoxide (CO)	SARL/IOP/013 (Issue No:01, Issue Date – 01.03.2023)	mg/m^3	BDL (D.L – 1.1)	02

Remarks: Limits: *National Ambient air quality standards from CPCB. BDL- Below detectable limit. DL –Detectable limit.

For Shrient Analytical and Research Labs Pvt. Ltd

06/01/24
Verified

06/01/24
Authorized Signatory

J. GNANAPRAKASAM
Technical Manager

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TEST REPORT

Report No.	SARL/23-155	Report Date.	06.01.2024

Customer Name & Address	Project Name: Thiru R. Natarajan - TOR File No 9971 The proposed quarry of Thiru.R.Natarajan survey nos. 253/7, 259/5, 259/2 and 259/4 over an extent of 2.31.50 Ha, Karadikudi Village, Anaicut Taluk, Vellore District, Tamil Nadu.
Sample Description	AMBIENT AIR QUALITY
Sampling Procedure	IS – 5182 (Part – 14: 2000 & Part – V: Reaffirmed - 2003), CPCB Guide lines

Sample Location	A2-THANGAL
Positioned height of Sampler	1.5 M above Ground Level

Customer Reference	As per work order	Sampling Procedure	24 hrs
Sample Reference No	SARL/A/CHE-155	Sample Received on	01.01.2024
Sample Collected by	LABORATORY	Test Commenced on	01.01.2024
Sample Collected Date	30.12.2023	Test Completed on	06.01.2024
Temperature	28°C	Relative Humidity	57%
Sample Condition	Fit for Analysis		

S. No.	Parameters	Protocol	Unit	Results	*Limits
1	Particulate Matter less than 10 micron size (PM_{10})	IS:5182: Part 23:2006	$\mu g/m^3$	48.2	100
2	Particulate Matter less than 2.5 micron size ($PM_{2.5}$)	IS 5182 (Part 24):2019	$\mu g/m^3$	24.6	60
3	Sulphur Dioxide (SO_2)	IS:5182: Part 02:2001	$\mu g/m^3$	6.2	80
4	Nitrogen Dioxide (NO_2)	IS:5182: Part 06:2006	$\mu g/m^3$	7.7	80
5	Carbon Monoxide (CO)	SARL/IOP/013 (Issue No:01, Issue Date – 01.03.2023)	mg/m^3	BDL (D.L – 1.1)	02

Remarks: Limits: *National Ambient air quality standards from CPCB. BDL- Below detectable limit. DL –Detectable limit.

For Shrient Analytical and Research Labs Pvt. Ltd

Verified 06/01/24

Authorized Signatory

END OF THE REPORT

J. GNANAPRAKASAM
Technical Manager

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TEST REPORT

Report No.	SARL/23-156	Report Date.	06.01.2024

Customer Name & Address	Project Name: Thiru R. Natarajan - TOR File No 9971 The proposed quarry of Thiru.R.Natarajan survey nos. 253/7, 259/5, 259/2 and 259/4 over an extent of 2.31.50 Ha, Karadikudi Village, Anaicut Taluk, Vellore District, Tamil Nadu.
Sample Description	AMBIENT AIR QUALITY
Sampling Procedure	IS – 5182 (Part – 14: 2000 & Part – V: Reaffirmed - 2003), CPCB Guide lines

Sample Location	A1-WITHIN MINE LEASE AREA
Positioned height of Sampler	1.5 M above Ground Level

Customer Reference	As per work order	Sampling Procedure	24 hrs
Sample Reference No	SARL/A/CHE-156	Sample Received on	01.01.2024
Sample Collected by	LABORATORY	Test Commenced on	01.01.2024
Sample Collected Date	31.12.2023	Test Completed on	06.01.2024
Temperature	29°C	Relative Humidity	52%
Sample Condition	Fit for Analysis		

S. No.	Parameters	Protocol	Unit	Results	*Limits
1	Particulate Matter less than 10 micron size (PM_{10})	IS:5182: Part 23:2006	$\mu g/m^3$	64.7	100
2	Particulate Matter less than 2.5 micron size ($PM_{2.5}$)	IS 5182 (Part 24):2019	$\mu g/m^3$	27.6	60
3	Sulphur Dioxide (SO_2)	IS:5182: Part 02:2001	$\mu g/m^3$	4.9	80
4	Nitrogen Dioxide (NO_2)	IS:5182: Part 06:2006	$\mu g/m^3$	9.7	80
5	Carbon Monoxide (CO)	SARL/IOP/013 (Issue No:01, Issue Date – 01.03.2023)	mg/m^3	BDL (D.L – 1.1)	02

Remarks: Limits: *National Ambient air quality standards from CPCB. BDL- Below detectable limit. DL –Detectable limit.

For Shrient Analytical and Research Labs Pvt. Ltd

Verified 06/01/24

Authorized Signatory

J. GNANAPRAKASAM
Technical Manager

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TEST REPORT

Report No.	SARL/23-157

Report Date.	06.01.2024

Customer Name & Address	Project Name: Thiru R. Natarajan - TOR File No 9971 The proposed quarry of Thiru.R.Natarajan survey nos. 253/7, 259/5, 259/2 and 259/4 over an extent of 2.31.50 Ha, Karadikudi Village, Anaicut Taluk, Vellore District, Tamil Nadu.
Sample Description	AMBIENT AIR QUALITY
Sampling Procedure	IS – 5182 (Part – 14: 2000 & Part – V: Reaffirmed - 2003), CPCB Guide lines

Sample Location	A2-THANGAL
Positioned height of Sampler	1.5 M above Ground Level

Customer Reference	As per work order	Sampling Procedure	24 hrs
Sample Reference No	SARL/A/CHE-157	Sample Received on	01.01.2024
Sample Collected by	LABORATORY	Test Commenced on	01.01.2024
Sample Collected Date	31.12.2023	Test Completed on	06.01.2024
Temperature	29°C	Relative Humidity	52%
Sample Condition	Fit for Analysis		

S. No.	Parameters	Protocol	Unit	Results	*Limits
1	Particulate Matter less than 10 micron size (PM_{10})	IS:5182: Part 23:2006	$\mu g/m^3$	54.1	100
2	Particulate Matter less than 2.5 micron size ($PM_{2.5}$)	IS 5182 (Part 24):2019	$\mu g/m^3$	26.7	60
3	Sulphur Dioxide (SO_2)	IS:5182: Part 02:2001	$\mu g/m^3$	4.8	80
4	Nitrogen Dioxide (NO_2)	IS:5182: Part 06:2006	$\mu g/m^3$	8.7	80
5	Carbon Monoxide (CO)	SARL/IOP/013 (Issue No:01, Issue Date – 01.03.2023)	mg/m^3	BDL (D.L – 1.1)	02

Remarks: Limits: *National Ambient air quality standards from CPCB. BDL- Below detectable limit. DL –Detectable limit.

For Shrient Analytical and Research Labs Pvt. Ltd

Verified 06/01/24

Shrient Analytical & Research Labs Pvt. Ltd. Chennai - 45

06/01/24

Authorized Signatory
J. GNANAPRAKASAM
Technical Manager

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Website : www.shrientanalytical.com

TEST REPORT

Report No.	SARL/23-013	Report Date.	21.10.2023

Customer Name & Address	Project Name: Thiru R. Natarajan - TOR File No 9971 The proposed quarry of Thiru.R.Natarajan survey nos. 253/7, 259/5, 259/2 and 259/4 over an extent of 2.31.50 Ha, Karadikudi Village, Anaicut Taluk, Vellore District, Tamil Nadu.
Sample Description	WATER
Sample Mark	SW 1 - Agaram aru River (Upstream) 4.17 km - NW

Customer Reference	As per work order	Sampling Procedure	IS 17614: Part 23: 2021
Sample Reference No.	SARL/W/CHE-013	Sample Received on	15.10.2023
Sample Collected by	LABORATORY	Test Commenced on	15.10.2023
Sample Collected Date	14.10.2023	Test Completed on	21.10.2023
Sample Condition	Fit for Analysis		

Sl. No.	Parameters	Protocol	Unit	Result
A.	**Physical parameters**			
1	Odour	IS 3025 (Part 5): 2018	-	Agreeable
2	Turbidity	APHA 24th Edition 2130 B: 2023	NTU	<1.0
3	pH at 25 °C	APHA 24th Edition 4500 – H+ B: 2023	-	8.01
4	Electrical Conductivity	APHA 24th Edition 2510 B: 2023	(µmhos/cm)	1042
5	Temperature	APHA 24th Edition 2550 B: 2023	°C	30.5
B.	**Chemical parameters**			
6	Total Dissolved Solids	APHA 24th Edition 2540-C: 2023	mg/L	630
7	Total Hardness (as $CaCO_3$)	APHA 24th Edition 2340 C: 2023	mg/L	312
8	Calcium (as Ca)	IS 3025 (Part 40): 1991	mg/L	68.4
9	Magnesium (as Mg)	IS 3025 (Part 46): 1994	mg/L	33.9
10	Calcium Hardness (as $CaCO_3$)	APHA 24th Edition 3500 Ca B: 2023	mg/L	171
11	Magnesium Hardness (as $CaCO_3$)	APHA 24th Edition 3500 Mg B: 2023	mg/L	141
12	Total Alkalinity (as $CaCO_3$)	APHA 24th Edition 2320 B: 2023	mg/L	372

21/10/23

21/10/23

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Website : www.shrientanalytical.com

TEST REPORT

Report No.	SARL/23-013

Report Date.	21.10.2023

Sl. No.	Parameters	Protocol	Unit	Result
13	Chloride (as Cl)	APHA 24th Edition 4500 Cl- B: 2023	mg/L	163
14	Free Residual chlorine	APHA 24th Edition 4500 Cl- B: 2023	mg/L	BDL (D.L – 0.2)
15	Sulphate as (SO_4^{2-})	APHA 24th Edition 4500 $SO4^{2-}$ E: 2023	mg/L	54.7
16	Iron (as Fe)	APHA 24th Edition 3500 Fe B: 2023	mg/L	0.03
17	Nitrate (as NO_3)	IS 3025 (Part 34): 1988	mg/L	2.35
18	Fluoride (as F)	APHA 24th Edition 4500 F- D: 2023	mg/L	0.66
19	Manganese (as Mn)	APHA 24th Edition 3500 Mn B: 2023	mg/L	BDL (D.L – 0.05)
20	Total suspended solids	APHA 24th Edition 2540-D: 2023	mg/L	14.0
21	Chemical Oxygen Demand	APHA 24th Edition 5220 B: 2023	mg/L	BDL (D.L – 4.0)
22	Biochemical oxygen demand (3 days at 27°C)	IS 3025 (Part 44): 1993	mg/L	BDL (D.L – 2.0)
23	Dissolved Oxygen	IS 3025 (Part 38): 1989	mg/L	6.5

Remarks: BDL – Below Detectable limit (DL - Detectable limit).

For Shrient Analytical and Research Labs Pvt. Ltd

Verified 21/10/23

Authorized Signatory 21/10/23

J. GNANAPRAKASAM
Technical Manager

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Please Contact:
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TEST REPORT

Report No.	SARL/23-014	Report Date.	21.10.2023

Customer Name & Address	Project Name: Thiru R. Natarajan - TOR File No 9971 The proposed quarry of Thiru.R.Natarajan survey nos. 253/7, 259/5, 259/2 and 259/4 over an extent of 2.31.50 Ha, Karadikudi Village, Anaicut Taluk, Vellore District, Tamil Nadu.
Sample Description	WATER
Sample Mark	SW 2 - Agaram aru River (Downstream)4.17 km - NW

Customer Reference	As per work order	Sampling Procedure	IS 17614: Part 23: 2021
Sample Reference No.	SARL/W/CHE-014	Sample Received on	15.10.2023
Sample Collected by	LABORATORY	Test Commenced on	15.10.2023
Sample Collected Date	14.10.2023	Test Completed on	21.10.2023
Sample Condition	Fit for Analysis		

Sl. No.	Parameters	Protocol	Unit	Result
A.	**Physical parameters**			
1	Odour	IS 3025 (Part 5): 2018	-	Agreeable
2	Turbidity	APHA 24th Edition 2130 B: 2023	NTU	<1.0
3	pH at 25 °C	APHA 24th Edition 4500 – H+ B: 2023	-	8.08
4	Electrical Conductivity	APHA 24th Edition 2510 B: 2023	(µmhos/cm)	1251
5	Temperature	APHA 24th Edition 2550 B: 2023	°C	31
B.	**Chemical parameters**			
6	Total Dissolved Solids	APHA 24th Edition 2540-C: 2023	mg/L	755
7	Total Hardness (as $CaCO_3$)	APHA 24th Edition 2340 C: 2023	mg/L	320
8	Calcium (as Ca)	IS 3025 (Part 40): 1991	mg/L	69.9
9	Magnesium (as Mg)	IS 3025 (Part 46): 1994	mg/L	34.8
10	Calcium Hardness (as $CaCO_3$)	APHA 24th Edition 3500 Ca B: 2023	mg/L	175
11	Magnesium Hardness (as $CaCO_3$)	APHA 24th Edition 3500 Mg B: 2023	mg/L	145
12	Total Alkalinity (as $CaCO_3$)	APHA 24th Edition 2320 B: 2023	mg/L	396

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TEST REPORT

Report No.	SARL/23-014

Report Date.	21.10.2023

Sl. No.	Parameters	Protocol	Unit	Result
13	Chloride (as Cl)	APHA 24th Edition 4500 Cl- B: 2023	mg/L	192
14	Free Residual chlorine	APHA 24th Edition 4500 Cl- B: 2023	mg/L	BDL (D.L – 0.2)
15	Sulphate as (SO_4^{2-})	APHA 24th Edition 4500 $SO4^{2-}$ E: 2023	mg/L	109
16	Iron (as Fe)	APHA 24th Edition 3500 Fe B: 2023	mg/L	0.06
17	Nitrate (as NO_3)	IS 3025 (Part 34): 1988	mg/L	1.25
18	Fluoride (as F)	APHA 24th Edition 4500 F- D: 2023	mg/L	0.70
19	Manganese (as Mn)	APHA 24th Edition 3500 Mn B: 2023	mg/L	BDL (D.L – 0.05)
20	Total suspended solids	APHA 24th Edition 2540-D: 2023	mg/L	24.0
21	Chemical Oxygen Demand	APHA 24th Edition 5220 B: 2023	mg/L	BDL (D.L – 4.0)
22	Biochemical oxygen demand (3 days at 27°C)	IS 3025 (Part 44): 1993	mg/L	BDL (D.L – 2.0)
23	Dissolved Oxygen	IS 3025 (Part 38): 1989	mg/L	6.2

Remarks: BDL – Below Detectable limit (DL - Detectable limit).

For Shrient Analytical and Research Labs Pvt. Ltd

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Technical Manager

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TEST REPORT

Report No.	SARL/23-015	Report Date.	21.10.2023

Customer Name & Address	Project Name: Thiru R. Natarajan - TOR File No 9971 The proposed quarry of Thiru.R.Natarajan survey nos. 253/7, 259/5, 259/2 and 259/4 over an extent of 2.31.50 Ha, Karadikudi Village, Anaicut Taluk, Vellore District, Tamil Nadu.
Sample Description	WATER
Sample Mark	SW 3 - Odiyathur Lake 2.12 km - NW

Customer Reference	As per work order	Sampling Procedure	IS 17614: Part 23: 2021
Sample Reference No.	SARL/W/CHE-015	Sample Received on	15.10.2023
Sample Collected by	LABORATORY	Test Commenced on	15.10.2023
Sample Collected Date	14.10.2023	Test Completed on	21.10.2023
Sample Condition	Fit for Analysis		

Sl. No.	Parameters	Protocol	Unit	Result
A.	**Physical parameters**			
1	Odour	IS 3025 (Part 5): 2018	-	Agreeable
2	Turbidity	APHA 24th Edition 2130 B: 2023	NTU	110
3	pH at 25 °C	APHA 24th Edition 4500 – H+ B: 2023	-	7.41
4	Electrical Conductivity	APHA 24th Edition 2510 B: 2023	(µmhos/cm)	511.2
5	Temperature	APHA 24th Edition 2550 B: 2023	°C	30.5
B.	**Chemical parameters**			
6	Total Dissolved Solids	APHA 24th Edition 2540-C: 2023	mg/L	326
7	Total Hardness (as $CaCO_3$)	APHA 24th Edition 2340 C: 2023	mg/L	190
8	Calcium (as Ca)	IS 3025 (Part 40): 1991	mg/L	52.1
9	Magnesium (as Mg)	IS 3025 (Part 46): 1994	mg/L	14.3
10	Calcium Hardness (as $CaCO_3$)	APHA 24th Edition 3500 Ca B: 2023	mg/L	130
11	Magnesium Hardness (as $CaCO_3$)	APHA 24th Edition 3500 Mg B: 2023	mg/L	59.5
12	Total Alkalinity (as $CaCO_3$)	APHA 24th Edition 2320 B: 2023	mg/L	14.1

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TEST REPORT

Report No.	SARL/23-015

Report Date.	21.10.2023

Sl. No.	Parameters	Protocol	Unit	Result
13	Chloride (as Cl)	APHA 24th Edition 4500 Cl- B: 2023	mg/L	51.2
14	Free Residual chlorine	APHA 24th Edition 4500 Cl- B: 2023	mg/L	BDL (D.L – 0.2)
15	Sulphate as (SO_4^{2-})	APHA 24th Edition 4500 $SO4^{2-}$ E: 2023	mg/L	65.8
16	Iron (as Fe)	APHA 24th Edition 3500 Fe B: 2023	mg/L	0.08
17	Nitrate (as NO_3)	IS 3025 (Part 34): 1988	mg/L	2.68
18	Fluoride (as F)	APHA 24th Edition 4500 F- D: 2023	mg/L	0.48
19	Manganese (as Mn)	APHA 24th Edition 3500 Mn B: 2023	mg/L	BDL (D.L – 0.05)
20	Total suspended solids	APHA 24th Edition 2540-D: 2023	mg/L	56.0
21	Chemical Oxygen Demand	APHA 24th Edition 5220 B: 2023	mg/L	BDL (D.L – 4.0)
22	Biochemical oxygen demand (3 days at 27°C)	IS 3025 (Part 44): 1993	mg/L	BDL (D.L – 2.0)
23	Dissolved Oxygen	IS 3025 (Part 38): 1989	mg/L	5.9

Remarks: BDL – Below Detectable limit (DL - Detectable limit).

For Shrient Analytical and Research Labs Pvt. Ltd

Verified 21/10/23

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J. GNANAPRAKASAM
Technical Manager

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TEST REPORT

Report No.	SARL/23-016	Report Date.	21.10.2023

Customer Name & Address	Project Name: Thiru R. Natarajan - TOR File No 9971 The proposed quarry of Thiru.R.Natarajan survey nos. 253/7, 259/5, 259/2 and 259/4 over an extent of 2.31.50 Ha, Karadikudi Village, Anaicut Taluk, Vellore District, Tamil Nadu.
Sample Description	WATER
Sample Mark	GW 1 - Within Mine Lease Area

Customer Reference	As per work order	Sampling Procedure	IS 17614: Part 14: 2021
Sample Reference No.	SARL/W/CHE-016	Sample Received on	15.10.2023
Sample Collected by	LABORATORY	Test Commenced on	15.10.2023
Sample Collected Date	14.10.2023	Test Completed on	21.10.2023
Sample Condition	Fit for Analysis		

Sl. No.	Parameters	Protocol	Unit	Result	*Limits Permissible
A.	**Physical parameters**				
1	Odour	IS 3025 (Part 5): 2018	-	Agreeable	Agreeable
2	Turbidity	APHA 24th Edition 2130 B: 2023	NTU	<1.0	5.0
3	pH at 25 °C	APHA 24th Edition 4500 – H+ B: 2023	-	7.61	6.50-8.50
4	Electrical Conductivity	APHA 24th Edition 2510 B: 2023	(µmhos/cm)	820.2	-
B.	**Chemical parameters**				
5	Total Dissolved Solids	APHA 24th Edition 2540-C: 2023	mg/L	495	2000
6	Total Hardness (as $CaCO_3$)	APHA 24th Edition 2340 C: 2023	mg/L	242	600
7	Calcium (as Ca)	IS 3025 (Part 40): 1991	mg/L	62.5	200
8	Magnesium (as Mg)	IS 3025 (Part 46): 1994	mg/L	20.5	100
9	Calcium Hardness (as $CaCO_3$)	APHA 24th Edition 3500 Ca B: 2023	mg/L	156	-

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TEST REPORT

Report No.	SARL/23-016

Report Date.	21.10.2023

Sl. No.	Parameters	Protocol	Unit	Result	*Limits Permissible
10	Magnesium Hardness (as $CaCO_3$)	APHA 24th Edition 3500 Mg B: 2023	mg/L	85.6	-
11	Total Alkalinity (as $CaCO_3$)	APHA 24th Edition 2320 B: 2023	mg/L	212	600
12	Chloride (as Cl)	APHA 24th Edition 4500 Cl- B: 2023	mg/L	143	1000
13	Free Residual chlorine	APHA 24th Edition 4500 Cl- B: 2023	mg/L	BDL (D.L – 0.2)	1.0
14	Sulphate as (SO_4^{2-})	APHA 24th Edition 4500 $SO4^2$- E: 2023	mg/L	64.8	400
15	Iron (as Fe)	APHA 24th Edition 3500 Fe B: 2023	mg/L	0.06	0.3
16	Nitrate (as NO_3)	IS 3025 (Part 34): 1988	mg/L	3.24	45
17	Fluoride (as F)	APHA 24th Edition 4500 F- D: 2023	mg/L	0.55	1.5
18	Manganese (as Mn)	APHA 24th Edition 3500 Mn B: 2023	mg/L	BDL (D.L – 0.05)	0.3

Remarks: Permissible Limit in the Absence of Alternate Source of Drinking Water Specifications IS: 10500:2012.
BDL – Below Detectable limit (DL - Detectable limit).

For Shrient Analytical and Research Labs Pvt. Ltd

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Technical Manager

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TEST REPORT

Report No.	SARL/23-017	Report Date.	21.10.2023

Customer Name & Address	Project Name: Thiru R. Natarajan - TOR File No 9971 The proposed quarry of Thiru.R.Natarajan survey nos. 253/7, 259/5, 259/2 and 259/4 over an extent of 2.31.50 Ha, Karadikudi Village, Anaicut Taluk, Vellore District, Tamil Nadu.
Sample Description	WATER
Sample Mark	GW 2 – Thangal Village

Customer Reference	As per work order	Sampling Procedure	IS 17614: Part 14: 2021
Sample Reference No.	SARL/W/CHE-017	Sample Received on	15.10.2023
Sample Collected by	LABORATORY	Test Commenced on	15.10.2023
Sample Collected Date	14.10.2023	Test Completed on	21.10.2023
Sample Condition	Fit for Analysis		

Sl. No.	Parameters	Protocol	Unit	Result	*Limits Permissible
A.	**Physical parameters**				
1	Odour	IS 3025 (Part 5): 2018	-	Agreeable	Agreeable
2	Turbidity	APHA 24th Edition 2130 B: 2023	NTU	<1.0	5.0
3	pH at 25 °C	APHA 24th Edition 4500 – H+ B: 2023	-	6.78	6.50-8.50
4	Electrical Conductivity	APHA 24th Edition 2510 B: 2023	(µmhos/cm)	1176	-
B.	**Chemical parameters**				
5	Total Dissolved Solids	APHA 24th Edition 2540-C: 2023	mg/L	730	2000
6	Total Hardness (as $CaCO_3$)	APHA 24th Edition 2340 C: 2023	mg/L	376	600
7	Calcium (as Ca)	IS 3025 (Part 40): 1991	mg/L	119	200
8	Magnesium (as Mg)	IS 3025 (Part 46): 1994	mg/L	18.7	100
9	Calcium Hardness (as $CaCO_3$)	APHA 24th Edition 3500 Ca B: 2023	mg/L	298	-

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TEST REPORT

Report No.	SARL/23-017

Report Date.	21.10.2023

Sl. No.	Parameters	Protocol	Unit	Result	*Limits Permissible
10	Magnesium Hardness (as $CaCO_3$)	APHA 24th Edition 3500 Mg B: 2023	mg/L	78.1	-
11	Total Alkalinity (as $CaCO_3$)	APHA 24th Edition 2320 B: 2023	mg/L	341	600
12	Chloride (as Cl)	APHA 24th Edition 4500 Cl- B: 2023	mg/L	222	1000
13	Free Residual chlorine	APHA 24th Edition 4500 Cl- B: 2023	mg/L	BDL (D.L – 0.2)	1.0
14	Sulphate as (SO_4^{2-})	APHA 24th Edition 4500 $SO4^{2-}$ E: 2023	mg/L	137	400
15	Iron (as Fe)	APHA 24th Edition 3500 Fe B: 2023	mg/L	0.06	0.3
16	Nitrate (as NO_3)	IS 3025 (Part 34): 1988	mg/L	2.98	45
17	Fluoride (as F)	APHA 24th Edition 4500 F- D: 2023	mg/L	0.19	1.5
18	Manganese (as Mn)	APHA 24th Edition 3500 Mn B: 2023	mg/L	BDL (D.L – 0.05)	0.3

Remarks: Permissible Limit in the Absence of Alternate Source of Drinking Water Specifications IS: 10500:2012.
BDL – Below Detectable limit (DL - Detectable limit).

For Shrient Analytical and Research Labs Pvt. Ltd

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TEST REPORT

Report No.	SARL/23-018	Report Date.	21.10.2023

Customer Name & Address	Project Name: Thiru R. Natarajan - TOR File No 9971 The proposed quarry of Thiru.R.Natarajan survey nos. 253/7, 259/5, 259/2 and 259/4 over an extent of 2.31.50 Ha, Karadikudi Village, Anaicut Taluk, Vellore District, Tamil Nadu.
Sample Description	WATER
Sample Mark	GW 3 – Pichanatham Village

Customer Reference	As per work order	Sampling Procedure	IS 17614: Part 14: 2021
Sample Reference No.	SARL/W/CHE-018	Sample Received on	15.10.2023
Sample Collected by	LABORATORY	Test Commenced on	15.10.2023
Sample Collected Date	14.10.2023	Test Completed on	21.10.2023
Sample Condition	Fit for Analysis		

Sl. No.	Parameters	Protocol	Unit	Result	*Limits Permissible
A.	**Physical parameters**				
1	Odour	IS 3025 (Part 5): 2018	-	Agreeable	Agreeable
2	Turbidity	APHA 24th Edition 2130 B: 2023	NTU	<1.0	5.0
3	pH at 25 °C	APHA 24th Edition 4500 – H+ B: 2023	-	7.38	6.50-8.50
4	Electrical Conductivity	APHA 24th Edition 2510 B: 2023	(µmhos/cm)	1398	-
B.	**Chemical parameters**				
5	Total Dissolved Solids	APHA 24th Edition 2540-C: 2023	mg/L	854	2000
6	Total Hardness (as $CaCO_3$)	APHA 24th Edition 2340 C: 2023	mg/L	413	600
7	Calcium (as Ca)	IS 3025 (Part 40): 1991	mg/L	126	200
8	Magnesium (as Mg)	IS 3025 (Part 46): 1994	mg/L	23.2	100
9	Calcium Hardness (as $CaCO_3$)	APHA 24th Edition 3500 Ca B: 2023	mg/L	316	-

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TEST REPORT

Report No.	SARL/23-018

Report Date.	21.10.2023

Sl. No.	Parameters	Protocol	Unit	Result	*Limits Permissible
10	Magnesium Hardness (as $CaCO_3$)	APHA 24th Edition 3500 Mg B: 2023	mg/L	96.7	-
11	Total Alkalinity (as $CaCO_3$)	APHA 24th Edition 2320 B: 2023	mg/L	318	600
12	Chloride (as Cl)	APHA 24th Edition 4500 Cl- B: 2023	mg/L	256	1000
13	Free Residual chlorine	APHA 24th Edition 4500 Cl- B: 2023	mg/L	BDL (D.L – 0.2)	1.0
14	Sulphate as (SO_4^{2-})	APHA 24th Edition 4500 $SO4^{2-}$ E: 2023	mg/L	199	400
15	Iron (as Fe)	APHA 24th Edition 3500 Fe B: 2023	mg/L	0.12	0.3
16	Nitrate (as NO_3)	IS 3025 (Part 34): 1988	mg/L	3.44	45
17	Fluoride (as F)	APHA 24th Edition 4500 F- D: 2023	mg/L	0.57	1.5
18	Manganese (as Mn)	APHA 24th Edition 3500 Mn B: 2023	mg/L	BDL (D.L – 0.05)	0.3

Remarks: Permissible Limit in the Absence of Alternate Source of Drinking Water Specifications IS: 10500:2012.
BDL – Below Detectable limit (DL - Detectable limit).

For Shrient Analytical and Research Labs Pvt. Ltd

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TEST REPORT

Report No.	SARL/23-019	Report Date.	21.10.2023

Customer Name & Address	Project Name: Thiru R. Natarajan - TOR File No 9971 The proposed quarry of Thiru.R.Natarajan survey nos. 253/7, 259/5, 259/2 and 259/4 over an extent of 2.31.50 Ha, Karadikudi Village, Anaicut Taluk, Vellore District, Tamil Nadu.
Sample Description	WATER
Sample Mark	GW 4 – Karadikudi Village

Customer Reference	As per work order	Sampling Procedure	IS 17614: Part 14: 2021
Sample Reference No.	SARL/W/CHE-019	Sample Received on	15.10.2023
Sample Collected by	LABORATORY	Test Commenced on	15.10.2023
Sample Collected Date	14.10.2023	Test Completed on	21.10.2023
Sample Condition	Fit for Analysis		

Sl. No.	Parameters	Protocol	Unit	Result	*Limits Permissible
A.	**Physical parameters**				
1	Odour	IS 3025 (Part 5): 2018	-	Agreeable	Agreeable
2	Turbidity	APHA 24th Edition 2130 B: 2023	NTU	<1.0	5.0
3	pH at 25 °C	APHA 24th Edition 4500 – H+ B: 2023	-	7.74	6.50-8.50
4	Electrical Conductivity	APHA 24th Edition 2510 B: 2023	(µmhos/cm)	2068	-
B.	**Chemical parameters**				
5	Total Dissolved Solids	APHA 24th Edition 2540-C: 2023	mg/L	1262	2000
6	Total Hardness (as $CaCO_3$)	APHA 24th Edition 2340 C: 2023	mg/L	446	600
7	Calcium (as Ca)	IS 3025 (Part 40): 1991	mg/L	104	200
8	Magnesium (as Mg)	IS 3025 (Part 46): 1994	mg/L	44.6	100
9	Calcium Hardness (as $CaCO_3$)	APHA 24th Edition 3500 Ca B: 2023	mg/L	260	-

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TEST REPORT

Report No.	SARL/23-019

Report Date.	21.10.2023

Sl. No.	Parameters	Protocol	Unit	Result	*Limits Permissible
10	Magnesium Hardness (as $CaCO_3$)	APHA 24th Edition 3500 Mg B: 2023	mg/L	186	-
11	Total Alkalinity (as $CaCO_3$)	APHA 24th Edition 2320 B: 2023	mg/L	396	600
12	Chloride (as Cl)	APHA 24th Edition 4500 Cl- B: 2023	mg/L	315	1000
13	Free Residual chlorine	APHA 24th Edition 4500 Cl- B: 2023	mg/L	BDL (D.L – 0.2)	1.0
14	Sulphate as (SO_4^{2-})	APHA 24th Edition 4500 $SO4^{2-}$ E: 2023	mg/L	315	400
15	Iron (as Fe)	APHA 24th Edition 3500 Fe B: 2023	mg/L	0.03	0.3
16	Nitrate (as NO_3)	IS 3025 (Part 34): 1988	mg/L	2.61	45
17	Fluoride (as F)	APHA 24th Edition 4500 F- D: 2023	mg/L	0.56	1.5
18	Manganese (as Mn)	APHA 24th Edition 3500 Mn B: 2023	mg/L	BDL (D.L – 0.05)	0.3

Remarks: Permissible Limit in the Absence of Alternate Source of Drinking Water Specifications IS: 10500:2012.
BDL – Below Detectable limit (DL - Detectable limit).

For Shrient Analytical and Research Labs Pvt. Ltd

21/10/23

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21/10/23

Authorized Signatory

J. GNANAPRAKASAM
Technical Manager

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Website : www.shrientanalytical.com

TEST REPORT

Report No.	SARL/23-020	Report Date.	21.10.2023

Customer Name & Address	Project Name: Thiru R. Natarajan - TOR File No 9971 The proposed quarry of Thiru.R.Natarajan survey nos. 253/7, 259/5, 259/2 and 259/4 over an extent of 2.31.50 Ha, Karadikudi Village, Anaicut Taluk, Vellore District, Tamil Nadu.
Sample Description	WATER
Sample Mark	GW 5 – Odiyathur Village

Customer Reference	As per work order	Sampling Procedure	IS 17614: Part 14: 2021
Sample Reference No.	SARL/W/CHE-020	Sample Received on	15.10.2023
Sample Collected by	LABORATORY	Test Commenced on	15.10.2023
Sample Collected Date	14.10.2023	Test Completed on	21.10.2023
Sample Condition	Fit for Analysis		

Sl. No.	Parameters	Protocol	Unit	Result	*Limits Permissible
A.	**Physical parameters**				
1	Odour	IS 3025 (Part 5): 2018	-	Agreeable	Agreeable
2	Turbidity	APHA 24th Edition 2130 B: 2023	NTU	<1.0	5.0
3	pH at 25 °C	APHA 24th Edition 4500 – H+ B: 2023	-	7.61	6.50-8.50
4	Electrical Conductivity	APHA 24th Edition 2510 B: 2023	(µmhos/cm)	1336	-
B.	**Chemical parameters**				
5	Total Dissolved Solids	APHA 24th Edition 2540-C: 2023	mg/L	844	2000
6	Total Hardness (as $CaCO_3$)	APHA 24th Edition 2340 C: 2023	mg/L	424	600
7	Calcium (as Ca)	IS 3025 (Part 40): 1991	mg/L	96.7	200
8	Magnesium (as Mg)	IS 3025 (Part 46): 1994	mg/L	43.7	100
9	Calcium Hardness (as $CaCO_3$)	APHA 24th Edition 3500 Ca B: 2023	mg/L	242	-

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TEST REPORT

Report No.	SARL/23-020

Report Date.	21.10.2023

Sl. No.	Parameters	Protocol	Unit	Result	*Limits Permissible
10	Magnesium Hardness (as $CaCO_3$)	APHA 24th Edition 3500 Mg B: 2023	mg/L	182	-
11	Total Alkalinity (as $CaCO_3$)	APHA 24th Edition 2320 B: 2023	mg/L	412	600
12	Chloride (as Cl)	APHA 24th Edition 4500 Cl- B: 2023	mg/L	158	1000
13	Free Residual chlorine	APHA 24th Edition 4500 Cl- B: 2023	mg/L	BDL (D.L – 0.2)	1.0
14	Sulphate as (SO_4^{2-})	APHA 24th Edition 4500 $SO4^{2-}$ E: 2023	mg/L	235	400
15	Iron (as Fe)	APHA 24th Edition 3500 Fe B: 2023	mg/L	BDL (D.L – 0.01)	0.3
16	Nitrate (as NO_3)	IS 3025 (Part 34): 1988	mg/L	1.87	45
17	Fluoride (as F)	APHA 24th Edition 4500 F- D: 2023	mg/L	0.62	1.5
18	Manganese (as Mn)	APHA 24th Edition 3500 Mn B: 2023	mg/L	BDL (D.L – 0.05)	0.3

Remarks: Permissible Limit in the Absence of Alternate Source of Drinking Water Specifications IS: 10500:2012.
BDL – Below Detectable limit (DL - Detectable limit).

For Shrient Analytical and Research Labs Pvt. Ltd

Verified 21/10/23

21/10/23

Authorized Signatory

J. GNANAPRAKASAM
Technical Manager

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TEST REPORT

Report No.	SARL/23-021	Report Date.	21.10.2023

Customer Name & Address	Project Name: Thiru R. Natarajan - TOR File No 9971 The proposed quarry of Thiru.R.Natarajan survey nos. 253/7, 259/5, 259/2 and 259/4 over an extent of 2.31.50 Ha, Karadikudi Village, Anaicut Taluk, Vellore District, Tamil Nadu.
Sample Description	WATER
Sample Mark	GW 6 – Anaicut Village

Customer Reference	As per work order	Sampling Procedure	IS 17614: Part 14: 2021
Sample Reference No.	SARL/W/CHE-021	Sample Received on	15.10.2023
Sample Collected by	LABORATORY	Test Commenced on	15.10.2023
Sample Collected Date	14.10.2023	Test Completed on	21.10.2023
Sample Condition	Fit for Analysis		

Sl. No.	Parameters	Protocol	Unit	Result	*Limits Permissible
A.	**Physical parameters**				
1	Odour	IS 3025 (Part 5): 2018	-	Agreeable	Agreeable
2	Turbidity	APHA 24th Edition 2130 B: 2023	NTU	<1.0	5.0
3	pH at 25 °C	APHA 24th Edition 4500 – H+ B: 2023	-	7.32	6.50-8.50
4	Electrical Conductivity	APHA 24th Edition 2510 B: 2023	(µmhos/cm)	2276	-
B.	**Chemical parameters**				
5	Total Dissolved Solids	APHA 24th Edition 2540-C: 2023	mg/L	1370	2000
6	Total Hardness (as $CaCO_3$)	APHA 24th Edition 2340 C: 2023	mg/L	577	600
7	Calcium (as Ca)	IS 3025 (Part 40): 1991	mg/L	150	200
8	Magnesium (as Mg)	IS 3025 (Part 46): 1994	mg/L	48.2	100
9	Calcium Hardness (as $CaCO_3$)	APHA 24th Edition 3500 Ca B: 2023	mg/L	376	-

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TEST REPORT

Report No.	SARL/23-021

Report Date.	21.10.2023

Sl. No.	Parameters	Protocol	Unit	Result	*Limits Permissible
10	Magnesium Hardness (as $CaCO_3$)	APHA 24th Edition 3500 Mg B: 2023	mg/L	201	-
11	Total Alkalinity (as $CaCO_3$)	APHA 24th Edition 2320 B: 2023	mg/L	498	600
12	Chloride (as Cl)	APHA 24th Edition 4500 Cl- B: 2023	mg/L	483	1000
13	Free Residual chlorine	APHA 24th Edition 4500 Cl- B: 2023	mg/L	BDL (D.L – 0.2)	1.0
14	Sulphate as (SO_4^{2-})	APHA 24th Edition 4500 $SO4^2$- E: 2023	mg/L	203	400
15	Iron (as Fe)	APHA 24th Edition 3500 Fe B: 2023	mg/L	0.04	0.3
16	Nitrate (as NO_3)	IS 3025 (Part 34): 1988	mg/L	2.65	45
17	Fluoride (as F)	APHA 24th Edition 4500 F- D: 2023	mg/L	0.69	1.5
18	Manganese (as Mn)	APHA 24th Edition 3500 Mn B: 2023	mg/L	BDL (D.L – 0.05)	0.3

Remarks: Permissible Limit in the Absence of Alternate Source of Drinking Water Specifications IS: 10500:2012.
BDL – Below Detectable limit (DL - Detectable limit).

For Shrient Analytical and Research Labs Pvt. Ltd

Verified 21/10/23

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TEST REPORT

Report No.	SARL/23-022	Report Date.	21.10.2023

Customer Name & Address	Project Name: Thiru R. Natarajan - TOR File No 9971 The proposed quarry of Thiru.R.Natarajan survey nos. 253/7, 259/5, 259/2 and 259/4 over an extent of 2.31.50 Ha, Karadikudi Village, Anaicut Taluk, Vellore District, Tamil Nadu.
Sample Description	SOIL
Sample Mark	S1 - Mine Lease Area

Customer Reference	As per work order	Sampling Procedure	EPA/600/R-92/128
Sample Reference No.	SARL/SO/CHE-022	Sample Received on	15.10.2023
Sample Collected by	LABORATORY	Test Commenced on	15.10.2023
Sample Collected Date	14.10.2023	Test Completed on	21.10.2023
Sample Condition	Fit for Analysis		

S. No.	Parameters	Protocol	Unit	Results
1	pH at 25 °C	IS 2720: Part 26: 1987	-	8.21
2	Electrical Conductivity	IS 14767: 2000	µmhos/cm	87.21
3	Dry matter content	IS 15106: 2002	%	90.86
4	Water Content	IS 15106: 2002	%	9.14
5	Organic Matter	IS 2720: Part 22: 1972	%	0.12
6	Nitrogen and Nitrogenous compounds	IS 14684: 1999	mg/kg	154
7	Soil Texture	Methods Manual - Soil testing in India - P. No-67: 2011	%	Silt Clay Loam
8	Grain Size Distribution i. Sand	Methods Manual - Soil testing in India - P. No-67: 2011	%	8.60
	ii. Silt	Methods Manual - Soil testing in India - P. No-67: 2011	%	54.20
	iii. Clay	Methods Manual - Soil testing in India - P. No-67: 2011	%	37.20
9	Phosphorus as P	IS 10158: 1982	mg/kg	0.14
10	Sodium as Na	USEPA 3050 B: 1996	mg/kg	1015
11	Potassium as K	USEPA 3050 B: 1996	mg/kg	515
12	Total soluble sulphates	IS 2720: Part 27: 1977	%	BDL (D.L – 0.02)
13	Porosity	SARL/SOP/SO/001 (Issue No:01, Issue Date – 01.03.2023): 2023	%	19.5
14	Water holding capacity	Methods Manual - Soil testing in India - P. No-76: 2011	Inches/foot	4.2

Remarks: BDL – Below Detectable limit (DL - Detectable limit).

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For Shrient Analytical and Research Labs Pvt. Ltd

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Technical Manager

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TEST REPORT

Report No.	SARL/23-023	Report Date.	21.10.2023

Customer Name & Address	Project Name: Thiru R. Natarajan - TOR File No 9971 The proposed quarry of Thiru.R.Natarajan survey nos. 253/7, 259/5, 259/2 and 259/4 over an extent of 2.31.50 Ha, Karadikudi Village, Anaicut Taluk, Vellore District, Tamil Nadu.
Sample Description	SOIL
Sample Mark	S2 - Thangal Village

Customer Reference	As per work order	Sampling Procedure	EPA/600/R-92/128
Sample Reference No.	SARL/SO/CHE-023	Sample Received on	15.10.2023
Sample Collected by	LABORATORY	Test Commenced on	15.10.2023
Sample Collected Date	14.10.2023	Test Completed on	21.10.2023
Sample Condition	Fit for Analysis		

S. No.	Parameters	Protocol	Unit	Results
1	pH at 25 °C	IS 2720: Part 26: 1987	-	7.52
2	Electrical Conductivity	IS 14767: 2000	µmhos/cm	64.83
3	Dry matter content	IS 15106: 2002	%	95.11
4	Water Content	IS 15106: 2002	%	4.89
5	Organic Matter	IS 2720: Part 22: 1972	%	0.15
6	Nitrogen and Nitrogenous compounds	IS 14684: 1999	mg/kg	192
7	Soil Texture	Methods Manual - Soil testing in India - P. No-67: 2011	%	Silt Clay
8	Grain Size Distribution i. Sand	Methods Manual - Soil testing in India - P. No-67: 2011	%	5.41
	ii. Silt	Methods Manual - Soil testing in India - P. No-67: 2011	%	49.39
	iii. Clay	Methods Manual - Soil testing in India - P. No-67: 2011	%	45.21
9	Phosphorus as P	IS 10158: 1982	mg/kg	0.14
10	Sodium as Na	USEPA 3050 B: 1996	mg/kg	825
11	Potassium as K	USEPA 3050 B: 1996	mg/kg	339
12	Total soluble sulphates	IS 2720: Part 27: 1977	%	BDL (D.L – 0.02)
13	Porosity	SARL/SOP/SO/001 (Issue No:01, Issue Date – 01.03.2023): 2023	%	18.4
14	Water holding capacity	Methods Manual - Soil testing in India - P. No-76: 2011	Inches/foot	3.9

Remarks: BDL – Below Detectable limit (DL - Detectable limit).

For Shrient Analytical and Research Labs Pvt. Ltd

Verified 21/10/23

Authorized Signatory

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Please Contact:
For any Technical Issues & Complaints: vimalnath@shrientanalytical.com J. GNANAPRAKASAM
Technical Manager

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TEST REPORT

Report No.	SARL/23-024	Report Date.	21.10.2023

Customer Name & Address	Project Name: Thiru R. Natarajan - TOR File No 9971 The proposed quarry of Thiru.R.Natarajan survey nos. 253/7, 259/5, 259/2 and 259/4 over an extent of 2.31.50 Ha, Karadikudi Village, Anaicut Taluk, Vellore District, Tamil Nadu.
Sample Description	SOIL
Sample Mark	S3 - Pichanatham Village

Customer Reference	As per work order	Sampling Procedure	EPA/600/R-92/128
Sample Reference No.	SARL/SO/CHE-024	Sample Received on	15.10.2023
Sample Collected by	LABORATORY	Test Commenced on	15.10.2023
Sample Collected Date	14.10.2023	Test Completed on	21.10.2023
Sample Condition	Fit for Analysis		

S. No.	Parameters	Protocol	Unit	Results
1	pH at 25 °C	IS 2720: Part 26: 1987	-	7.94
2	Electrical Conductivity	IS 14767: 2000	µmhos/cm	109.20
3	Dry matter content	IS 15106: 2002	%	91.62
4	Water Content	IS 15106: 2002	%	8.38
5	Organic Matter	IS 2720: Part 22: 1972	%	0.21
6	Nitrogen and Nitrogenous compounds	IS 14684: 1999	mg/kg	177
7	Soil Texture	Methods Manual - Soil testing in India - P. No-67: 2011	%	Clay
8	Grain Size Distribution i. Sand	Methods Manual - Soil testing in India - P. No-67: 2011	%	5.16
	ii. Silt	Methods Manual - Soil testing in India - P. No-67: 2011	%	37.06
	iii. Clay	Methods Manual - Soil testing in India - P. No-67: 2011	%	57.78
9	Phosphorus as P	IS 10158: 1982	mg/kg	0.14
10	Sodium as Na	USEPA 3050 B: 1996	mg/kg	793
11	Potassium as K	USEPA 3050 B: 1996	mg/kg	384
12	Total soluble sulphates	IS 2720: Part 27: 1977	%	BDL (D.L – 0.02)
13	Porosity	SARL/SOP/SO/001 (Issue No:01, Issue Date – 01.03.2023): 2023	%	17.2
14	Water holding capacity	Methods Manual - Soil testing in India - P. No-76: 2011	Inches/foot	4.7

Remarks: BDL – Below Detectable limit (DL - Detectable limit).

For Shrient Analytical and Research Labs Pvt. Ltd

Verified 21/10/23

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J. GNANAPRAKASAM
Technical Manager

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TEST REPORT

Report No.	SARL/23-025	Report Date.	21.10.2023

Customer Name & Address	Project Name: Thiru R. Natarajan - TOR File No 9971 The proposed quarry of Thiru.R.Natarajan survey nos. 253/7, 259/5, 259/2 and 259/4 over an extent of 2.31.50 Ha, Karadikudi Village, Anaicut Taluk, Vellore District, Tamil Nadu.
Sample Description	NOISE LEVEL DATA

Customer Reference	As per work order	Sampling Method	SARL/IOP/023
Sample Reference No	SARL/N/CHE-025	Date of Monitoring	14.10.2023
Sample Collected by	LABORATORY		

Level in dB (A)

Time in hrs	N1	N2	N3	N4	N5	N6
06.00	41.4	38.0	39.7	40.2	37.9	38.7
07.00	43.5	45.4	42.3	48.1	40.2	46.0
08.00	45.7	49.4	45.2	46.9	46.4	50.1
09.00	47.2	50.8	47.1	48.5	50.0	51.4
10.00	48.5	48.1	48.3	40.8	51.8	48.7
11.00	44.8	51.1	47.2	44.1	49.0	51.7
12.00	46.7	45.3	48.1	45.2	48.1	45.9
13.00	45.2	46.1	48.7	43.4	47.5	46.7
14.00	45.4	49.1	46.8	46.3	50.9	49.7
15.00	53.8	48.2	44.1	42.5	51.2	48.8
16.00	45.2	48.0	47.2	44.7	50.5	48.2
17.00	42.8	43.1	43.4	46.2	49.5	43.7
18.00	41.5	41.0	43.8	45.1	46.9	41.8
19.00	39.3	40.3	45.2	42.7	45.4	40.9
20.00	38.2	39.1	40.9	40.2	43.2	39.7
21.00	39.8	41.0	42.0	38.2	42.2	42.2
22.00	39.0	37.2	40.1	36.3	38.7	37.8
23.00	39.4	35.8	39.2	36.8	38.1	36.4
24.00	36.0	38.0	37.7	37.5	37.2	38.9
01.00	36.5	36.4	38.1	36.4	36.4	37.0
02.00	35.2	37.2	37.5	37.8	38.2	37.8
03.00	35.8	38.5	38.2	36.9	38.8	39.1
04.00	36.5	36.4	39.0	37.1	39.3	37.0
05.00	38.3	40.1	38.0	37.9	38.8	40.7

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TEST REPORT

Report No.	SARL/23-025

Report Date.	21.10.2023

	N1	N2	N3	N4	N5	N6
DAY EQUIVALENT	44.6	46.9	45.8	44.8	48.3	47.5
NIGHT EQUIVALENT	37.3	37.7	38.6	37.1	38.3	38.3
DAY & NIGHT EQUIVALENT	43.2	45.4	44.4	43.4	46.8	46.0

Remarks:

LOCATIONS:

N1 - Mine Lease Area
N2 - Thangal Village
N3 - Pichanatham Village
N4 - Karadikudi Village
N5 - Odiyathur Village
N6 - Anaicut Village

21/10/23

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Shrient Analytical & Research Labs Pvt. Ltd. Chennai

For Shrient Analytical and Research Labs Pvt. Ltd

21/10/23

Authorized Signatory

J. GNANAPRAKASAM
Technical Manager

END OF THE REPORT

Please Contact:
For any Technical Issues & Complaints: vimalnath@shrientanalytical.com

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Shrient Analytical and Research Labs Pvt. Ltd.

416/15, Dharga Road, Perungalathur, West Tambaram, Chennai- 600045.
Phone No: 9841074398 / 9698141777 E-mail : Info@shrientanalytical.com
Website : www.shrientanalytical.com

TEST REPORT

Report No.	SARL/23-001	Report Date.	21.10.2023

Customer Name & Address	Project Name: Thiru R. Natarajan - TOR File No 9971 The proposed quarry of Thiru.R.Natarajan survey nos. 253/7, 259/5, 259/2 and 259/4 over an extent of 2.31.50 Ha, Karadikudi Village, Anaicut Taluk, Vellore District, Tamil Nadu.
Sample Description	AMBIENT AIR QUALITY
Sampling Procedure	IS – 5182 (Part – 14: 2000 & Part – V: Reaffirmed - 2003), CPCB Guide lines

Sample Location	A1-WITHIN MINE LEASE AREA
Positioned height of Sampler	1.5 M above Ground Level

Customer Reference	As per work order	Sampling Procedure	24 hrs
Sample Reference No	SARL/A/CHE-001	Sample Received on	16.10.2023
Sample Collected by	LABORATORY	Test Commenced on	16.10.2023
Sample Collected Date	10.10.2023	Test Completed on	21.10.2023
Temperature	33°C	Relative Humidity	45%
Sample Condition	Fit for Analysis		

S. No.	Parameters	Protocol	Unit	Results	*Limits
1	Particulate Matter less than 10 micron size (PM_{10})	IS:5182: Part 23:2006	$\mu g/m^3$	60.2	100
2	Particulate Matter less than 2.5 micron size ($PM_{2.5}$)	IS 5182 (Part 24):2019	$\mu g/m^3$	26.3	60
3	Sulphur Dioxide (SO_2)	IS:5182: Part 02:2001	$\mu g/m^3$	5.2	80
4	Nitrogen Dioxide (NO_2)	IS:5182: Part 06:2006	$\mu g/m^3$	9.6	80
5	Carbon Monoxide (CO)	SARL/IOP/013 (Issue No:01, Issue Date – 01.03.2023)	mg/m^3	BDL (D.L – 1.1)	02

Remarks: Limits: *National Ambient air quality standards from CPCB. BDL- Below detectable limit. DL –Detectable limit.

For Shrient Analytical and Research Labs Pvt. Ltd

Verified 21/10/23

Authorized Signatory

J. GNANAPRAKASAM
Technical Manager

END OF THE REPORT

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TEST REPORT

Report No.	SARL/23-002	Report Date.	21.10.2023

Customer Name & Address	Project Name: Thiru R. Natarajan - TOR File No 9971 The proposed quarry of Thiru.R.Natarajan survey nos. 253/7, 259/5, 259/2 and 259/4 over an extent of 2.31.50 Ha, Karadikudi Village, Anaicut Taluk, Vellore District, Tamil Nadu.
Sample Description	AMBIENT AIR QUALITY
Sampling Procedure	IS – 5182 (Part – 14: 2000 & Part – V: Reaffirmed - 2003), CPCB Guide lines

Sample Location	A2-THANGAL
Positioned height of Sampler	1.5 M above Ground Level

Customer Reference	As per work order	Sampling Procedure	24 hrs
Sample Reference No	SARL/A/CHE-002	Sample Received on	16.10.2023
Sample Collected by	LABORATORY	Test Commenced on	16.10.2023
Sample Collected Date	10.10.2023	Test Completed on	21.10.2023
Temperature	33°C	Relative Humidity	45%
Sample Condition	Fit for Analysis		

S. No.	Parameters	Protocol	Unit	Results	*Limits
1	Particulate Matter less than 10 micron size (PM_{10})	IS:5182: Part 23:2006	$\mu g/m^3$	46.1	100
2	Particulate Matter less than 2.5 micron size ($PM_{2.5}$)	IS 5182 (Part 24):2019	$\mu g/m^3$	23.8	60
3	Sulphur Dioxide (SO_2)	IS:5182: Part 02:2001	$\mu g/m^3$	4.8	80
4	Nitrogen Dioxide (NO_2)	IS:5182: Part 06:2006	$\mu g/m^3$	7.5	80
5	Carbon Monoxide (CO)	SARL/IOP/013 (Issue No:01, Issue Date – 01.03.2023)	mg/m^3	BDL (D.L – 1.1)	02

Remarks: Limits: *National Ambient air quality standards from CPCB. BDL- Below detectable limit. DL –Detectable limit.

For Shrient Analytical and Research Labs Pvt. Ltd

Verified 21/10/23

Authorized Signatory

J. GNANAPRAKASAM
Technical Manager

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TEST REPORT

Report No.	SARL/23-003

Report Date.	21.10.2023

Customer Name & Address	Project Name: Thiru R. Natarajan - TOR File No 9971 The proposed quarry of Thiru.R.Natarajan survey nos. 253/7, 259/5, 259/2 and 259/4 over an extent of 2.31.50 Ha, Karadikudi Village, Anaicut Taluk, Vellore District, Tamil Nadu.
Sample Description	AMBIENT AIR QUALITY
Sampling Procedure	IS – 5182 (Part – 14: 2000 & Part – V: Reaffirmed - 2003), CPCB Guide lines

Sample Location	A1-WITHIN MINE LEASE AREA
Positioned height of Sampler	1.5 M above Ground Level

Customer Reference	As per work order	Sampling Procedure	24 hrs
Sample Reference No	SARL/A/CHE-003	Sample Received on	16.10.2023
Sample Collected by	LABORATORY	Test Commenced on	16.10.2023
Sample Collected Date	11.10.2023	Test Completed on	21.10.2023
Temperature	26°C	Relative Humidity	82%
Sample Condition	Fit for Analysis		

S. No.	Parameters	Protocol	Unit	Results	*Limits
1	Particulate Matter less than 10 micron size (PM_{10})	IS:5182: Part 23:2006	$\mu g/m^3$	57.4	100
2	Particulate Matter less than 2.5 micron size ($PM_{2.5}$)	IS 5182 (Part 24):2019	$\mu g/m^3$	24.1	60
3	Sulphur Dioxide (SO_2)	IS:5182: Part 02:2001	$\mu g/m^3$	4.4	80
4	Nitrogen Dioxide (NO_2)	IS:5182: Part 06:2006	$\mu g/m^3$	10.5	80
5	Carbon Monoxide (CO)	SARL/IOP/013 (Issue No:01, Issue Date – 01.03.2023)	mg/m^3	BDL (D.L – 1.1)	02

Remarks: Limits: *National Ambient air quality standards from CPCB. BDL- Below detectable limit. DL –Detectable limit.

For Shrient Analytical and Research Labs Pvt. Ltd

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Authorized Signatory
J. GNANAPRAKASAM
Technical Manager

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TEST REPORT

Report No.	SARL/23-004	Report Date.	21.10.2023

Customer Name & Address	Project Name: Thiru R. Natarajan - TOR File No 9971 The proposed quarry of Thiru.R.Natarajan survey nos. 253/7, 259/5, 259/2 and 259/4 over an extent of 2.31.50 Ha, Karadikudi Village, Anaicut Taluk, Vellore District, Tamil Nadu.
Sample Description	AMBIENT AIR QUALITY
Sampling Procedure	IS – 5182 (Part – 14: 2000 & Part – V: Reaffirmed - 2003), CPCB Guide lines

Sample Location	A2-THANGAL
Positioned height of Sampler	1.5 M above Ground Level

Customer Reference	As per work order	Sampling Procedure	24 hrs
Sample Reference No	SARL/A/CHE-004	Sample Received on	16.10.2023
Sample Collected by	LABORATORY	Test Commenced on	16.10.2023
Sample Collected Date	11.10.2023	Test Completed on	21.10.2023
Temperature	26°C	Relative Humidity	82%
Sample Condition	Fit for Analysis		

S. No.	Parameters	Protocol	Unit	Results	*Limits
1	Particulate Matter less than 10 micron size (PM_{10})	IS:5182: Part 23:2006	$\mu g/m^3$	48.4	100
2	Particulate Matter less than 2.5 micron size ($PM_{2.5}$)	IS 5182 (Part 24):2019	$\mu g/m^3$	21.1	60
3	Sulphur Dioxide (SO_2)	IS:5182: Part 02:2001	$\mu g/m^3$	4.2	80
4	Nitrogen Dioxide (NO_2)	IS:5182: Part 06:2006	$\mu g/m^3$	7.9	80
5	Carbon Monoxide (CO)	SARL/IOP/013 (Issue No:01, Issue Date – 01.03.2023)	mg/m^3	BDL (D.L – 1.1)	02

Remarks: Limits: *National Ambient air quality standards from CPCB. BDL- Below detectable limit. DL –Detectable limit.

For Shrient Analytical and Research Labs Pvt. Ltd

Verified 21/10/23

Authorized Signatory
J. GNANAPRAKASAM
Technical Manager

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TEST REPORT

Report No.	SARL/23-005

Report Date.	21.10.2023

Customer Name & Address	Project Name: Thiru R. Natarajan - TOR File No 9971 The proposed quarry of Thiru.R.Natarajan survey nos. 253/7, 259/5, 259/2 and 259/4 over an extent of 2.31.50 Ha, Karadikudi Village, Anaicut Taluk, Vellore District, Tamil Nadu.
Sample Description	AMBIENT AIR QUALITY
Sampling Procedure	IS – 5182 (Part – 14: 2000 & Part – V: Reaffirmed - 2003), CPCB Guide lines

Sample Location	A3-PICHANATHAM
Positioned height of Sampler	1.5 M above Ground Level

Customer Reference	As per work order	Sampling Procedure	24 hrs
Sample Reference No	SARL/A/CHE-005	Sample Received on	16.10.2023
Sample Collected by	LABORATORY	Test Commenced on	16.10.2023
Sample Collected Date	12.10.2023	Test Completed on	21.10.2023
Temperature	31°C	Relative Humidity	58%
Sample Condition	Fit for Analysis		

S. No.	Parameters	Protocol	Unit	Results	*Limits
1	Particulate Matter less than 10 micron size (PM_{10})	IS:5182: Part 23:2006	$\mu g/m^3$	42.2	100
2	Particulate Matter less than 2.5 micron size ($PM_{2.5}$)	IS 5182 (Part 24):2019	$\mu g/m^3$	22.1	60
3	Sulphur Dioxide (SO_2)	IS:5182: Part 02:2001	$\mu g/m^3$	4.3	80
4	Nitrogen Dioxide (NO_2)	IS:5182: Part 06:2006	$\mu g/m^3$	6.6	80
5	Carbon Monoxide (CO)	SARL/IOP/013 (Issue No:01, Issue Date – 01.03.2023)	mg/m^3	BDL (D.L – 1.1)	02

Remarks: Limits: *National Ambient air quality standards from CPCB. BDL- Below detectable limit. DL –Detectable limit.

For Shrient Analytical and Research Labs Pvt. Ltd

Verified 21/10/23

Authorized Signatory 21/10/23

J. GNANAPRAKASAM
Technical Manager

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TEST REPORT

Report No.	SARL/23-006	Report Date.	21.10.2023

Customer Name & Address	Project Name: Thiru R. Natarajan - TOR File No 9971 The proposed quarry of Thiru.R.Natarajan survey nos. 253/7, 259/5, 259/2 and 259/4 over an extent of 2.31.50 Ha, Karadikudi Village, Anaicut Taluk, Vellore District, Tamil Nadu.
Sample Description	AMBIENT AIR QUALITY
Sampling Procedure	IS – 5182 (Part – 14: 2000 & Part – V: Reaffirmed - 2003), CPCB Guide lines

Sample Location	A4-KARADIKUDI
Positioned height of Sampler	1.5 M above Ground Level

Customer Reference	As per work order	Sampling Procedure	24 hrs
Sample Reference No	SARL/A/CHE-006	Sample Received on	16.10.2023
Sample Collected by	LABORATORY	Test Commenced on	16.10.2023
Sample Collected Date	12.10.2023	Test Completed on	21.10.2023
Temperature	31°C	Relative Humidity	58%
Sample Condition	Fit for Analysis		

S. No.	Parameters	Protocol	Unit	Results	*Limits
1	Particulate Matter less than 10 micron size (PM_{10})	IS:5182: Part 23:2006	$\mu g/m^3$	54.1	100
2	Particulate Matter less than 2.5 micron size ($PM_{2.5}$)	IS 5182 (Part 24):2019	$\mu g/m^3$	29.7	60
3	Sulphur Dioxide (SO_2)	IS:5182: Part 02:2001	$\mu g/m^3$	6.2	80
4	Nitrogen Dioxide (NO_2)	IS:5182: Part 06:2006	$\mu g/m^3$	9.1	80
5	Carbon Monoxide (CO)	SARL/IOP/013 (Issue No:01, Issue Date – 01.03.2023)	mg/m^3	BDL (D.L – 1.1)	02

Remarks: Limits: *National Ambient air quality standards from CPCB. BDL- Below detectable limit. DL –Detectable limit.

For Shrient Analytical and Research Labs Pvt. Ltd

Verified 21/10/23

Authorized Signatory

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J. GNANAPRAKASAM
Technical Manager

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Website : www.shrientanalytical.com

TEST REPORT

Report No.	SARL/23-007	Report Date.	21.10.2023

Customer Name & Address	Project Name: Thiru R. Natarajan - TOR File No 9971 The proposed quarry of Thiru.R.Natarajan survey nos. 253/7, 259/5, 259/2 and 259/4 over an extent of 2.31.50 Ha, Karadikudi Village, Anaicut Taluk, Vellore District, Tamil Nadu.
Sample Description	AMBIENT AIR QUALITY
Sampling Procedure	IS – 5182 (Part – 14: 2000 & Part – V: Reaffirmed - 2003), CPCB Guide lines

Sample Location	A3-PICHANATHAM
Positioned height of Sampler	1.5 M above Ground Level

Customer Reference	As per work order	Sampling Procedure	24 hrs
Sample Reference No	SARL/A/CHE-007	Sample Received on	16.10.2023
Sample Collected by	LABORATORY	Test Commenced on	16.10.2023
Sample Collected Date	13.10.2023	Test Completed on	21.10.2023
Temperature	32°C	Relative Humidity	43%
Sample Condition	Fit for Analysis		

S. No.	Parameters	Protocol	Unit	Results	*Limits
1	Particulate Matter less than 10 micron size (PM_{10})	IS:5182: Part 23:2006	$\mu g/m^3$	43.8	100
2	Particulate Matter less than 2.5 micron size ($PM_{2.5}$)	IS 5182 (Part 24):2019	$\mu g/m^3$	18.7	60
3	Sulphur Dioxide (SO_2)	IS:5182: Part 02:2001	$\mu g/m^3$	5.2	80
4	Nitrogen Dioxide (NO_2)	IS:5182: Part 06:2006	$\mu g/m^3$	7.2	80
5	Carbon Monoxide (CO)	SARL/IOP/013 (Issue No:01, Issue Date – 01.03.2023)	mg/m^3	BDL (D.L – 1.1)	02

Remarks: Limits: *National Ambient air quality standards from CPCB. BDL- Below detectable limit. DL –Detectable limit.

For Shrient Analytical and Research Labs Pvt. Ltd

Verified 21/10/23

Authorized Signatory

J. GNANAPRAKASAM
Technical Manager

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TEST REPORT

Report No.	SARL/23-008	Report Date.	21.10.2023

Customer Name & Address	Project Name: Thiru R. Natarajan - TOR File No 9971 The proposed quarry of Thiru.R.Natarajan survey nos. 253/7, 259/5, 259/2 and 259/4 over an extent of 2.31.50 Ha, Karadikudi Village, Anaicut Taluk, Vellore District, Tamil Nadu.
Sample Description	AMBIENT AIR QUALITY
Sampling Procedure	IS – 5182 (Part – 14: 2000 & Part – V: Reaffirmed - 2003), CPCB Guide lines

Sample Location	A4-KARADIKUDI
Positioned height of Sampler	1.5 M above Ground Level

Customer Reference	As per work order	Sampling Procedure	24 hrs
Sample Reference No	SARL/A/CHE-008	Sample Received on	16.10.2023
Sample Collected by	LABORATORY	Test Commenced on	16.10.2023
Sample Collected Date	13.10.2023	Test Completed on	21.10.2023
Temperature	32°C	Relative Humidity	43%
Sample Condition	Fit for Analysis		

S. No.	Parameters	Protocol	Unit	Results	*Limits
1	Particulate Matter less than 10 micron size (PM_{10})	IS:5182: Part 23:2006	$\mu g/m^3$	51.4	100
2	Particulate Matter less than 2.5 micron size ($PM_{2.5}$)	IS 5182 (Part 24):2019	$\mu g/m^3$	24.1	60
3	Sulphur Dioxide (SO_2)	IS:5182: Part 02:2001	$\mu g/m^3$	5.1	80
4	Nitrogen Dioxide (NO_2)	IS:5182: Part 06:2006	$\mu g/m^3$	9.9	80
5	Carbon Monoxide (CO)	SARL/IOP/013 (Issue No:01, Issue Date – 01.03.2023)	mg/m^3	BDL (D.L – 1.1)	02

Remarks: Limits: *National Ambient air quality standards from CPCB. BDL- Below detectable limit. DL –Detectable limit.

For Shrient Analytical and Research Labs Pvt. Ltd

Verified 21/10/23

Authorized Signatory
J. GNANAPRAKASAM
Technical Manager

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TEST REPORT

Report No.	SARL/23-009	Report Date.	21.10.2023

Customer Name & Address	Project Name: Thiru R. Natarajan - TOR File No 9971 The proposed quarry of Thiru.R.Natarajan survey nos. 253/7, 259/5, 259/2 and 259/4 over an extent of 2.31.50 Ha, Karadikudi Village, Anaicut Taluk, Vellore District, Tamil Nadu.
Sample Description	AMBIENT AIR QUALITY
Sampling Procedure	IS – 5182 (Part – 14: 2000 & Part – V: Reaffirmed - 2003), CPCB Guide lines

Sample Location	A5-ODIYATHUR
Positioned height of Sampler	1.5 M above Ground Level

Customer Reference	As per work order	Sampling Procedure	24 hrs
Sample Reference No	SARL/A/CHE-009	Sample Received on	16.10.2023
Sample Collected by	LABORATORY	Test Commenced on	16.10.2023
Sample Collected Date	14.10.2023	Test Completed on	21.10.2023
Temperature	31°C	Relative Humidity	45%
Sample Condition	Fit for Analysis		

S. No.	Parameters	Protocol	Unit	Results	*Limits
1	Particulate Matter less than 10 micron size (PM_{10})	IS:5182: Part 23:2006	$\mu g/m^3$	47.7	100
2	Particulate Matter less than 2.5 micron size ($PM_{2.5}$)	IS 5182 (Part 24):2019	$\mu g/m^3$	21.9	60
3	Sulphur Dioxide (SO_2)	IS:5182: Part 02:2001	$\mu g/m^3$	5.5	80
4	Nitrogen Dioxide (NO_2)	IS:5182: Part 06:2006	$\mu g/m^3$	9.2	80
5	Carbon Monoxide (CO)	SARL/IOP/013 (Issue No:01, Issue Date – 01.03.2023)	mg/m^3	BDL (D.L – 1.1)	02

Remarks: Limits: *National Ambient air quality standards from CPCB. BDL- Below detectable limit. DL –Detectable limit.

For Shrient Analytical and Research Labs Pvt. Ltd

Verified 21/10/23

Authorized Signatory

J. GNANAPRAKASAM
Technical Manager

END OF THE REPORT

Please Contact:
For any Technical Issues & Complaints: vimalnath@shrientanalytical.com

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Website : www.shrientanalytical.com

TEST REPORT

Report No.	SARL/23-010

Report Date.	21.10.2023

Customer Name & Address	Project Name: Thiru R. Natarajan - TOR File No 9971 The proposed quarry of Thiru.R.Natarajan survey nos. 253/7, 259/5, 259/2 and 259/4 over an extent of 2.31.50 Ha, Karadikudi Village, Anaicut Taluk, Vellore District, Tamil Nadu.
Sample Description	AMBIENT AIR QUALITY
Sampling Procedure	IS – 5182 (Part – 14: 2000 & Part – V: Reaffirmed - 2003), CPCB Guide lines

Sample Location	A6-ANAICUT
Positioned height of Sampler	1.5 M above Ground Level

Customer Reference	As per work order	Sampling Procedure	24 hrs
Sample Reference No	SARL/A/CHE-010	Sample Received on	16.10.2023
Sample Collected by	LABORATORY	Test Commenced on	16.10.2023
Sample Collected Date	14.10.2023	Test Completed on	21.10.2023
Temperature	31°C	Relative Humidity	45%
Sample Condition	Fit for Analysis		

S. No.	Parameters	Protocol	Unit	Results	*Limits
1	Particulate Matter less than 10 micron size (PM_{10})	IS:5182: Part 23:2006	$\mu g/m^3$	50.7	100
2	Particulate Matter less than 2.5 micron size ($PM_{2.5}$)	IS 5182 (Part 24):2019	$\mu g/m^3$	22.8	60
3	Sulphur Dioxide (SO_2)	IS:5182: Part 02:2001	$\mu g/m^3$	4.9	80
4	Nitrogen Dioxide (NO_2)	IS:5182: Part 06:2006	$\mu g/m^3$	7.2	80
5	Carbon Monoxide (CO)	SARL/IOP/013 (Issue No:01, Issue Date – 01.03.2023)	mg/m^3	BDL (D.L – 1.1)	02

Remarks: Limits: *National Ambient air quality standards from CPCB. BDL- Below detectable limit. DL –Detectable limit.

For Shrient Analytical and Research Labs Pvt. Ltd

Verified 21/10/23

Authorized Signatory

J. GNANAPRAKASAM
Technical Manager

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TEST REPORT

Report No.	SARL/23-011	Report Date.	21.10.2023

Customer Name & Address	Project Name: Thiru R. Natarajan - TOR File No 9971 The proposed quarry of Thiru.R.Natarajan survey nos. 253/7, 259/5, 259/2 and 259/4 over an extent of 2.31.50 Ha, Karadikudi Village, Anaicut Taluk, Vellore District, Tamil Nadu.
Sample Description	AMBIENT AIR QUALITY
Sampling Procedure	IS – 5182 (Part – 14: 2000 & Part – V: Reaffirmed - 2003), CPCB Guide lines

Sample Location	A5-ODIYATHUR
Positioned height of Sampler	1.5 M above Ground Level

Customer Reference	As per work order	Sampling Procedure	24 hrs
Sample Reference No	SARL/A/CHE-011	Sample Received on	16.10.2023
Sample Collected by	LABORATORY	Test Commenced on	16.10.2023
Sample Collected Date	15.10.2023	Test Completed on	21.10.2023
Temperature	31°C	Relative Humidity	57%
Sample Condition	Fit for Analysis		

S. No.	Parameters	Protocol	Unit	Results	*Limits
1	Particulate Matter less than 10 micron size (PM_{10})	IS:5182: Part 23:2006	$\mu g/m^3$	45.2	100
2	Particulate Matter less than 2.5 micron size ($PM_{2.5}$)	IS 5182 (Part 24):2019	$\mu g/m^3$	20.8	60
3	Sulphur Dioxide (SO_2)	IS:5182: Part 02:2001	$\mu g/m^3$	4.9	80
4	Nitrogen Dioxide (NO_2)	IS:5182: Part 06:2006	$\mu g/m^3$	8.7	80
5	Carbon Monoxide (CO)	SARL/IOP/013 (Issue No:01, Issue Date – 01.03.2023)	mg/m^3	BDL (D.L – 1.1)	02

Remarks: Limits: *National Ambient air quality standards from CPCB. BDL- Below detectable limit. DL –Detectable limit.

For Shrient Analytical and Research Labs Pvt. Ltd

Verified 21/10/23

END OF THE REPORT

Authorized Signatory
J. GNANAPRAKASAM
Technical Manager

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TEST REPORT

Report No.	SARL/23-012	Report Date.	21.10.2023

Customer Name & Address	Project Name: Thiru R. Natarajan - TOR File No 9971 The proposed quarry of Thiru.R.Natarajan survey nos. 253/7, 259/5, 259/2 and 259/4 over an extent of 2.31.50 Ha, Karadikudi Village, Anaicut Taluk, Vellore District, Tamil Nadu.
Sample Description	AMBIENT AIR QUALITY
Sampling Procedure	IS – 5182 (Part – 14: 2000 & Part – V: Reaffirmed - 2003), CPCB Guide lines

Sample Location	A6-ANAICUT
Positioned height of Sampler	1.5 M above Ground Level

Customer Reference	As per work order	Sampling Procedure	24 hrs
Sample Reference No	SARL/A/CHE-012	Sample Received on	16.10.2023
Sample Collected by	LABORATORY	Test Commenced on	16.10.2023
Sample Collected Date	15.10.2023	Test Completed on	21.10.2023
Temperature	31°C	Relative Humidity	57%
Sample Condition	Fit for Analysis		

S. No.	Parameters	Protocol	Unit	Results	*Limits
1	Particulate Matter less than 10 micron size (PM_{10})	IS:5182: Part 23:2006	$\mu g/m^3$	48.1	100
2	Particulate Matter less than 2.5 micron size ($PM_{2.5}$)	IS 5182 (Part 24):2019	$\mu g/m^3$	21.6	60
3	Sulphur Dioxide (SO_2)	IS:5182: Part 02:2001	$\mu g/m^3$	4.1	80
4	Nitrogen Dioxide (NO_2)	IS:5182: Part 06:2006	$\mu g/m^3$	8.3	80
5	Carbon Monoxide (CO)	SARL/IOP/013 (Issue No:01, Issue Date – 01.03.2023)	mg/m^3	BDL (D.L – 1.1)	02

Remarks: Limits: *National Ambient air quality standards from CPCB. BDL- Below detectable limit. DL –Detectable limit.

For Shrient Analytical and Research Labs Pvt. Ltd

Verified 21/10/23

Authorized Signatory

J. GNANAPRAKASAM
Technical Manager

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TEST REPORT

Report No.	SARL/23-026	Report Date.	28.10.2023

Customer Name & Address	Project Name: Thiru R. Natarajan - TOR File No 9971 The proposed quarry of Thiru.R.Natarajan survey nos. 253/7, 259/5, 259/2 and 259/4 over an extent of 2.31.50 Ha, Karadikudi Village, Anaicut Taluk, Vellore District, Tamil Nadu.
Sample Description	AMBIENT AIR QUALITY
Sampling Procedure	IS – 5182 (Part – 14: 2000 & Part – V: Reaffirmed - 2003), CPCB Guide lines

Sample Location	A5-ODIYATHUR
Positioned height of Sampler	1.5 M above Ground Level

Customer Reference	As per work order	Sampling Procedure	24 hrs
Sample Reference No	SARL/A/CHE-026	Sample Received on	23.10.2023
Sample Collected by	LABORATORY	Test Commenced on	23.10.2023
Sample Collected Date	17.10.2023	Test Completed on	28.10.2023
Temperature	31°C	Relative Humidity	49%
Sample Condition	Fit for Analysis		

S. No.	Parameters	Protocol	Unit	Results	*Limits
1	Particulate Matter less than 10 micron size (PM_{10})	IS:5182: Part 23:2006	$\mu g/m^3$	52.5	100
2	Particulate Matter less than 2.5 micron size ($PM_{2.5}$)	IS 5182 (Part 24):2019	$\mu g/m^3$	24.2	60
3	Sulphur Dioxide (SO_2)	IS:5182: Part 02:2001	$\mu g/m^3$	7.8	80
4	Nitrogen Dioxide (NO_2)	IS:5182: Part 06:2006	$\mu g/m^3$	9.1	80
5	Carbon Monoxide (CO)	SARL/IOP/013 (Issue No:01, Issue Date – 01.03.2023)	mg/m^3	BDL (D.L – 1.1)	02

Remarks: Limits: *National Ambient air quality standards from CPCB. BDL- Below detectable limit. DL –Detectable limit.

For Shrient Analytical and Research Labs Pvt. Ltd

Verified 28/10/23

Authorized Signatory

J. GNANAPRAKASAM
Technical Manager

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TEST REPORT

Report No.	SARL/23-027

Report Date.	28.10.2023

Customer Name & Address	Project Name: Thiru R. Natarajan - TOR File No 9971 The proposed quarry of Thiru.R.Natarajan survey nos. 253/7, 259/5, 259/2 and 259/4 over an extent of 2.31.50 Ha, Karadikudi Village, Anaicut Taluk, Vellore District, Tamil Nadu.
Sample Description	AMBIENT AIR QUALITY
Sampling Procedure	IS – 5182 (Part – 14: 2000 & Part – V: Reaffirmed - 2003), CPCB Guide lines

Sample Location	A6-ANAICUT
Positioned height of Sampler	1.5 M above Ground Level

Customer Reference	As per work order	Sampling Procedure	24 hrs
Sample Reference No	SARL/A/CHE-027	Sample Received on	23.10.2023
Sample Collected by	LABORATORY	Test Commenced on	23.10.2023
Sample Collected Date	17.10.2023	Test Completed on	28.10.2023
Temperature	31°C	Relative Humidity	49%
Sample Condition	Fit for Analysis		

S. No.	Parameters	Protocol	Unit	Results	*Limits
1	Particulate Matter less than 10 micron size (PM_{10})	IS:5182: Part 23:2006	$\mu g/m^3$	46.6	100
2	Particulate Matter less than 2.5 micron size ($PM_{2.5}$)	IS 5182 (Part 24):2019	$\mu g/m^3$	20.9	60
3	Sulphur Dioxide (SO_2)	IS:5182: Part 02:2001	$\mu g/m^3$	4.5	80
4	Nitrogen Dioxide (NO_2)	IS:5182: Part 06:2006	$\mu g/m^3$	6.9	80
5	Carbon Monoxide (CO)	SARL/IOP/013 (Issue No:01, Issue Date – 01.03.2023)	mg/m^3	BDL (D.L – 1.1)	02

Remarks: Limits: *National Ambient air quality standards from CPCB. BDL- Below detectable limit. DL –Detectable limit.

For Shrient Analytical and Research Labs Pvt. Ltd

Verified 28/10/23

Authorized Signatory

J. GNANAPRAKASAM
Technical Manager

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TEST REPORT

Report No.	SARL/23-028

Report Date.	28.10.2023

Customer Name & Address	Project Name: Thiru R. Natarajan - TOR File No 9971 The proposed quarry of Thiru.R.Natarajan survey nos. 253/7, 259/5, 259/2 and 259/4 over an extent of 2.31.50 Ha, Karadikudi Village, Anaicut Taluk, Vellore District, Tamil Nadu.
Sample Description	AMBIENT AIR QUALITY
Sampling Procedure	IS – 5182 (Part – 14: 2000 & Part – V: Reaffirmed - 2003), CPCB Guide lines

Sample Location	A5-ODIYATHUR
Positioned height of Sampler	1.5 M above Ground Level

Customer Reference	As per work order	Sampling Procedure	24 hrs
Sample Reference No	SARL/A/CHE-028	Sample Received on	23.10.2023
Sample Collected by	LABORATORY	Test Commenced on	23.10.2023
Sample Collected Date	18.10.2023	Test Completed on	28.10.2023
Temperature	31°C	Relative Humidity	48%
Sample Condition	Fit for Analysis		

S. No.	Parameters	Protocol	Unit	Results	*Limits
1	Particulate Matter less than 10 micron size (PM_{10})	IS:5182: Part 23:2006	$\mu g/m^3$	50.4	100
2	Particulate Matter less than 2.5 micron size ($PM_{2.5}$)	IS 5182 (Part 24):2019	$\mu g/m^3$	23.3	60
3	Sulphur Dioxide (SO_2)	IS:5182: Part 02:2001	$\mu g/m^3$	4.7	80
4	Nitrogen Dioxide (NO_2)	IS:5182: Part 06:2006	$\mu g/m^3$	9.8	80
5	Carbon Monoxide (CO)	SARL/IOP/013 (Issue No:01, Issue Date – 01.03.2023)	mg/m^3	BDL (D.L – 1.1)	02

Remarks: Limits: *National Ambient air quality standards from CPCB. BDL- Below detectable limit. DL –Detectable limit.

For Shrient Analytical and Research Labs Pvt. Ltd

Verified 28/10/23

Authorized Signatory

J. GNANAPRAKASAM
Technical Manager

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TEST REPORT

Report No.	SARL/23-029	Report Date.	28.10.2023

Customer Name & Address	Project Name: Thiru R. Natarajan - TOR File No 9971 The proposed quarry of Thiru.R.Natarajan survey nos. 253/7, 259/5, 259/2 and 259/4 over an extent of 2.31.50 Ha, Karadikudi Village, Anaicut Taluk, Vellore District, Tamil Nadu.
Sample Description	AMBIENT AIR QUALITY
Sampling Procedure	IS – 5182 (Part – 14: 2000 & Part – V: Reaffirmed - 2003), CPCB Guide lines

Sample Location	A6-ANAICUT
Positioned height of Sampler	1.5 M above Ground Level

Customer Reference	As per work order	Sampling Procedure	24 hrs
Sample Reference No	SARL/A/CHE-029	Sample Received on	23.10.2023
Sample Collected by	LABORATORY	Test Commenced on	23.10.2023
Sample Collected Date	18.10.2023	Test Completed on	28.10.2023
Temperature	31°C	Relative Humidity	48%
Sample Condition	Fit for Analysis		

S. No.	Parameters	Protocol	Unit	Results	*Limits
1	Particulate Matter less than 10 micron size (PM_{10})	IS:5182: Part 23:2006	$\mu g/m^3$	54.3	100
2	Particulate Matter less than 2.5 micron size ($PM_{2.5}$)	IS 5182 (Part 24):2019	$\mu g/m^3$	24.4	60
3	Sulphur Dioxide (SO_2)	IS:5182: Part 02:2001	$\mu g/m^3$	4.9	80
4	Nitrogen Dioxide (NO_2)	IS:5182: Part 06:2006	$\mu g/m^3$	7.3	80
5	Carbon Monoxide (CO)	SARL/IOP/013 (Issue No:01, Issue Date – 01.03.2023)	mg/m^3	BDL (D.L – 1.1)	02

Remarks: Limits: *National Ambient air quality standards from CPCB. BDL- Below detectable limit. DL –Detectable limit.

For Shrient Analytical and Research Labs Pvt. Ltd

Verified 28/10/23

Authorized Signatory 28/10/23

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Please Contact:
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J. GNANAPRAKASAM
Technical Manager

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TEST REPORT

Report No.	SARL/23-030	Report Date.	28.10.2023

Customer Name & Address	Project Name: Thiru R. Natarajan - TOR File No 9971 The proposed quarry of Thiru.R.Natarajan survey nos. 253/7, 259/5, 259/2 and 259/4 over an extent of 2.31.50 Ha, Karadikudi Village, Anaicut Taluk, Vellore District, Tamil Nadu.
Sample Description	AMBIENT AIR QUALITY
Sampling Procedure	IS – 5182 (Part – 14: 2000 & Part – V: Reaffirmed - 2003), CPCB Guide lines

Sample Location	A3-PICHANATHAM
Positioned height of Sampler	1.5 M above Ground Level

Customer Reference	As per work order	Sampling Procedure	24 hrs
Sample Reference No	SARL/A/CHE-030	Sample Received on	23.10.2023
Sample Collected by	LABORATORY	Test Commenced on	23.10.2023
Sample Collected Date	19.10.2023	Test Completed on	28.10.2023
Temperature	31°C	Relative Humidity	47%
Sample Condition	Fit for Analysis		

S. No.	Parameters	Protocol	Unit	Results	*Limits
1	Particulate Matter less than 10 micron size (PM_{10})	IS:5182: Part 23:2006	$\mu g/m^3$	50.3	100
2	Particulate Matter less than 2.5 micron size ($PM_{2.5}$)	IS 5182 (Part 24):2019	$\mu g/m^3$	24.9	60
3	Sulphur Dioxide (SO_2)	IS:5182: Part 02:2001	$\mu g/m^3$	6.2	80
4	Nitrogen Dioxide (NO_2)	IS:5182: Part 06:2006	$\mu g/m^3$	8.3	80
5	Carbon Monoxide (CO)	SARL/IOP/013 (Issue No:01, Issue Date – 01.03.2023)	mg/m^3	BDL (D.L – 1.1)	02

Remarks: Limits: *National Ambient air quality standards from CPCB. BDL- Below detectable limit. DL –Detectable limit.

For Shrient Analytical and Research Labs Pvt. Ltd

Verified 28/10/23

Authorized Signatory

END OF THE REPORT

J. GNANAPRAKASAM
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TEST REPORT

Report No.	SARL/23-031

Report Date.	28.10.2023

Customer Name & Address	Project Name: Thiru R. Natarajan - TOR File No 9971 The proposed quarry of Thiru.R.Natarajan survey nos. 253/7, 259/5, 259/2 and 259/4 over an extent of 2.31.50 Ha, Karadikudi Village, Anaicut Taluk, Vellore District, Tamil Nadu.
Sample Description	AMBIENT AIR QUALITY
Sampling Procedure	IS – 5182 (Part – 14: 2000 & Part – V: Reaffirmed - 2003), CPCB Guide lines

Sample Location	A4-KARADIKUDI
Positioned height of Sampler	1.5 M above Ground Level

Customer Reference	As per work order	Sampling Procedure	24 hrs
Sample Reference No	SARL/A/CHE-031	Sample Received on	23.10.2023
Sample Collected by	LABORATORY	Test Commenced on	23.10.2023
Sample Collected Date	19.10.2023	Test Completed on	28.10.2023
Temperature	31°C	Relative Humidity	47%
Sample Condition	Fit for Analysis		

S. No.	Parameters	Protocol	Unit	Results	*Limits
1	Particulate Matter less than 10 micron size (PM_{10})	IS:5182: Part 23:2006	$\mu g/m^3$	59.2	100
2	Particulate Matter less than 2.5 micron size ($PM_{2.5}$)	IS 5182 (Part 24):2019	$\mu g/m^3$	27.7	60
3	Sulphur Dioxide (SO_2)	IS:5182: Part 02:2001	$\mu g/m^3$	5.8	80
4	Nitrogen Dioxide (NO_2)	IS:5182: Part 06:2006	$\mu g/m^3$	9.1	80
5	Carbon Monoxide (CO)	SARL/IOP/013 (Issue No:01, Issue Date – 01.03.2023)	mg/m^3	BDL (D.L – 1.1)	02

Remarks: Limits: *National Ambient air quality standards from CPCB. BDL- Below detectable limit. DL –Detectable limit.

For Shrient Analytical and Research Labs Pvt. Ltd

Verified 28/10/23

Authorized Signatory

END OF THE REPORT

J. GNANAPRAKASAM
Technical Manager

Please Contact:
For any Technical Issues & Complaints: vimalnath@shrientanalytical.com

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Website : www.shrientanalytical.com

TEST REPORT

Report No.	SARL/23-032	Report Date.	28.10.2023

Customer Name & Address	Project Name: Thiru R. Natarajan - TOR File No 9971 The proposed quarry of Thiru.R.Natarajan survey nos. 253/7, 259/5, 259/2 and 259/4 over an extent of 2.31.50 Ha, Karadikudi Village, Anaicut Taluk, Vellore District, Tamil Nadu.
Sample Description	AMBIENT AIR QUALITY
Sampling Procedure	IS – 5182 (Part – 14: 2000 & Part – V: Reaffirmed - 2003), CPCB Guide lines

Sample Location	A3-PICHANATHAM
Positioned height of Sampler	1.5 M above Ground Level

Customer Reference	As per work order	Sampling Procedure	24 hrs
Sample Reference No	SARL/A/CHE-032	Sample Received on	23.10.2023
Sample Collected by	LABORATORY	Test Commenced on	23.10.2023
Sample Collected Date	20.10.2023	Test Completed on	28.10.2023
Temperature	31°C	Relative Humidity	50%
Sample Condition	Fit for Analysis		

S. No.	Parameters	Protocol	Unit	Results	*Limits
1	Particulate Matter less than 10 micron size (PM_{10})	IS:5182: Part 23:2006	$\mu g/m^3$	48.4	100
2	Particulate Matter less than 2.5 micron size ($PM_{2.5}$)	IS 5182 (Part 24):2019	$\mu g/m^3$	25.3	60
3	Sulphur Dioxide (SO_2)	IS:5182: Part 02:2001	$\mu g/m^3$	5.2	80
4	Nitrogen Dioxide (NO_2)	IS:5182: Part 06:2006	$\mu g/m^3$	7.4	80
5	Carbon Monoxide (CO)	SARL/IOP/013 (Issue No:01, Issue Date – 01.03.2023)	mg/m^3	BDL (D.L – 1.1)	02

Remarks: Limits: *National Ambient air quality standards from CPCB. BDL- Below detectable limit. DL –Detectable limit.

For Shrient Analytical and Research Labs Pvt. Ltd

Verified 28/10/23

28/10/23

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J. GNANAPRAKASAM
Technical Manager

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TEST REPORT

Report No.	SARL/23-033

Report Date.	28.10.2023

Customer Name & Address	Project Name: Thiru R. Natarajan - TOR File No 9971 The proposed quarry of Thiru.R.Natarajan survey nos. 253/7, 259/5, 259/2 and 259/4 over an extent of 2.31.50 Ha, Karadikudi Village, Anaicut Taluk, Vellore District, Tamil Nadu.
Sample Description	AMBIENT AIR QUALITY
Sampling Procedure	IS – 5182 (Part – 14: 2000 & Part – V: Reaffirmed - 2003), CPCB Guide lines

Sample Location	A4-KARADIKUDI
Positioned height of Sampler	1.5 M above Ground Level

Customer Reference	As per work order	Sampling Procedure	24 hrs
Sample Reference No	SARL/A/CHE-033	Sample Received on	23.10.2023
Sample Collected by	LABORATORY	Test Commenced on	23.10.2023
Sample Collected Date	20.10.2023	Test Completed on	28.10.2023
Temperature	31°C	Relative Humidity	50%
Sample Condition	Fit for Analysis		

S. No.	Parameters	Protocol	Unit	Results	*Limits
1	Particulate Matter less than 10 micron size (PM_{10})	IS:5182: Part 23:2006	$\mu g/m^3$	56.4	100
2	Particulate Matter less than 2.5 micron size ($PM_{2.5}$)	IS 5182 (Part 24):2019	$\mu g/m^3$	28.5	60
3	Sulphur Dioxide (SO_2)	IS:5182: Part 02:2001	$\mu g/m^3$	7.2	80
4	Nitrogen Dioxide (NO_2)	IS:5182: Part 06:2006	$\mu g/m^3$	9.7	80
5	Carbon Monoxide (CO)	SARL/IOP/013 (Issue No:01, Issue Date – 01.03.2023)	mg/m^3	BDL (D.L – 1.1)	02

Remarks: Limits: *National Ambient air quality standards from CPCB. BDL- Below detectable limit. DL –Detectable limit.

For Shrient Analytical and Research Labs Pvt. Ltd

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28/10/23

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TEST REPORT

Report No.	SARL/23-034	Report Date.	28.10.2023

Customer Name & Address	Project Name: Thiru R. Natarajan - TOR File No 9971 The proposed quarry of Thiru.R.Natarajan survey nos. 253/7, 259/5, 259/2 and 259/4 over an extent of 2.31.50 Ha, Karadikudi Village, Anaicut Taluk, Vellore District, Tamil Nadu.
Sample Description	AMBIENT AIR QUALITY
Sampling Procedure	IS – 5182 (Part – 14: 2000 & Part – V: Reaffirmed - 2003), CPCB Guide lines

Sample Location	A1-WITHIN MINE LEASE AREA
Positioned height of Sampler	1.5 M above Ground Level

Customer Reference	As per work order	Sampling Procedure	24 hrs
Sample Reference No	SARL/A/CHE-034	Sample Received on	23.10.2023
Sample Collected by	LABORATORY	Test Commenced on	23.10.2023
Sample Collected Date	21.10.2023	Test Completed on	28.10.2023
Temperature	32°C	Relative Humidity	46%
Sample Condition	Fit for Analysis		

S. No.	Parameters	Protocol	Unit	Results	*Limits
1	Particulate Matter less than 10 micron size (PM_{10})	IS:5182: Part 23:2006	$\mu g/m^3$	55.9	100
2	Particulate Matter less than 2.5 micron size ($PM_{2.5}$)	IS 5182 (Part 24):2019	$\mu g/m^3$	26.7	60
3	Sulphur Dioxide (SO_2)	IS:5182: Part 02:2001	$\mu g/m^3$	4.8	80
4	Nitrogen Dioxide (NO_2)	IS:5182: Part 06:2006	$\mu g/m^3$	9.3	80
5	Carbon Monoxide (CO)	SARL/IOP/013 (Issue No:01, Issue Date – 01.03.2023)	mg/m^3	BDL (D.L – 1.1)	02

Remarks: Limits: *National Ambient air quality standards from CPCB. BDL- Below detectable limit. DL –Detectable limit.

For Shrient Analytical and Research Labs Pvt. Ltd

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TEST REPORT

Report No.	SARL/23-035	Report Date.	28.10.2023

Customer Name & Address	Project Name: Thiru R. Natarajan - TOR File No 9971 The proposed quarry of Thiru.R.Natarajan survey nos. 253/7, 259/5, 259/2 and 259/4 over an extent of 2.31.50 Ha, Karadikudi Village, Anaicut Taluk, Vellore District, Tamil Nadu.
Sample Description	AMBIENT AIR QUALITY
Sampling Procedure	IS – 5182 (Part – 14: 2000 & Part – V: Reaffirmed - 2003), CPCB Guide lines

Sample Location	A2-THANGAL
Positioned height of Sampler	1.5 M above Ground Level

Customer Reference	As per work order	Sampling Procedure	24 hrs
Sample Reference No	SARL/A/CHE-035	Sample Received on	23.10.2023
Sample Collected by	LABORATORY	Test Commenced on	23.10.2023
Sample Collected Date	21.10.2023	Test Completed on	28.10.2023
Temperature	32°C	Relative Humidity	46%
Sample Condition	Fit for Analysis		

S. No.	Parameters	Protocol	Unit	Results	*Limits
1	Particulate Matter less than 10 micron size (PM_{10})	IS:5182: Part 23:2006	$\mu g/m^3$	47.2	100
2	Particulate Matter less than 2.5 micron size ($PM_{2.5}$)	IS 5182 (Part 24):2019	$\mu g/m^3$	24.3	60
3	Sulphur Dioxide (SO_2)	IS:5182: Part 02:2001	$\mu g/m^3$	4.9	80
4	Nitrogen Dioxide (NO_2)	IS:5182: Part 06:2006	$\mu g/m^3$	8.7	80
5	Carbon Monoxide (CO)	SARL/IOP/013 (Issue No:01, Issue Date – 01.03.2023)	mg/m^3	BDL (D.L – 1.1)	02

Remarks: Limits: *National Ambient air quality standards from CPCB. BDL- Below detectable limit. DL –Detectable limit.

For Shrient Analytical and Research Labs Pvt. Ltd

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Chennai - 45

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J. GNANAPRAKASAM
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TEST REPORT

Report No.	SARL/23-036	Report Date.	28.10.2023

Customer Name & Address	Project Name: Thiru R. Natarajan - TOR File No 9971 The proposed quarry of Thiru.R.Natarajan survey nos. 253/7, 259/5, 259/2 and 259/4 over an extent of 2.31.50 Ha, Karadikudi Village, Anaicut Taluk, Vellore District, Tamil Nadu.
Sample Description	AMBIENT AIR QUALITY
Sampling Procedure	IS – 5182 (Part – 14: 2000 & Part – V: Reaffirmed - 2003), CPCB Guide lines

Sample Location	A1-WITHIN MINE LEASE AREA
Positioned height of Sampler	1.5 M above Ground Level

Customer Reference	As per work order	Sampling Procedure	24 hrs
Sample Reference No	SARL/A/CHE-036	Sample Received on	23.10.2023
Sample Collected by	LABORATORY	Test Commenced on	23.10.2023
Sample Collected Date	22.10.2023	Test Completed on	28.10.2023
Temperature	31°C	Relative Humidity	54%
Sample Condition	Fit for Analysis		

S. No.	Parameters	Protocol	Unit	Results	*Limits
1	Particulate Matter less than 10 micron size (PM_{10})	IS:5182: Part 23:2006	$\mu g/m^3$	63.6	100
2	Particulate Matter less than 2.5 micron size ($PM_{2.5}$)	IS 5182 (Part 24):2019	$\mu g/m^3$	27.9	60
3	Sulphur Dioxide (SO_2)	IS:5182: Part 02:2001	$\mu g/m^3$	5.2	80
4	Nitrogen Dioxide (NO_2)	IS:5182: Part 06:2006	$\mu g/m^3$	9.7	80
5	Carbon Monoxide (CO)	SARL/IOP/013 (Issue No:01, Issue Date – 01.03.2023)	mg/m^3	BDL (D.L – 1.1)	02

Remarks: Limits: *National Ambient air quality standards from CPCB. BDL- Below detectable limit. DL –Detectable limit.

For Shrient Analytical and Research Labs Pvt. Ltd

Verified 28/10/23

Authorized Signatory
J. GNANAPRAKASAM
Technical Manager

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Please Contact:
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TEST REPORT

Report No.	SARL/23-037	Report Date.	28.10.2023

Customer Name & Address	Project Name: Thiru R. Natarajan - TOR File No 9971 The proposed quarry of Thiru.R.Natarajan survey nos. 253/7, 259/5, 259/2 and 259/4 over an extent of 2.31.50 Ha, Karadikudi Village, Anaicut Taluk, Vellore District, Tamil Nadu.
Sample Description	AMBIENT AIR QUALITY
Sampling Procedure	IS – 5182 (Part – 14: 2000 & Part – V: Reaffirmed - 2003), CPCB Guide lines

Sample Location	A2-THANGAL
Positioned height of Sampler	1.5 M above Ground Level

Customer Reference	As per work order	Sampling Procedure	24 hrs
Sample Reference No	SARL/A/CHE-037	Sample Received on	23.10.2023
Sample Collected by	LABORATORY	Test Commenced on	23.10.2023
Sample Collected Date	22.10.2023	Test Completed on	28.10.2023
Temperature	31°C	Relative Humidity	54%
Sample Condition	Fit for Analysis		

S. No.	Parameters	Protocol	Unit	Results	*Limits
1	Particulate Matter less than 10 micron size (PM_{10})	IS:5182: Part 23:2006	$\mu g/m^3$	46.1	100
2	Particulate Matter less than 2.5 micron size ($PM_{2.5}$)	IS 5182 (Part 24):2019	$\mu g/m^3$	21.8	60
3	Sulphur Dioxide (SO_2)	IS:5182: Part 02:2001	$\mu g/m^3$	4.6	80
4	Nitrogen Dioxide (NO_2)	IS:5182: Part 06:2006	$\mu g/m^3$	8.1	80
5	Carbon Monoxide (CO)	SARL/IOP/013 (Issue No:01, Issue Date – 01.03.2023)	mg/m^3	BDL (D.L – 1.1)	02

Remarks: Limits: *National Ambient air quality standards from CPCB. BDL- Below detectable limit. DL –Detectable limit.

For Shrient Analytical and Research Labs Pvt. Ltd

Verified 28/10/23

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28/10/23

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Chennai - 45

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TEST REPORT

Report No.	SARL/23-038

Report Date.	04.11.2023

Customer Name & Address	Project Name: Thiru R. Natarajan - TOR File No 9971 The proposed quarry of Thiru.R.Natarajan survey nos. 253/7, 259/5, 259/2 and 259/4 over an extent of 2.31.50 Ha, Karadikudi Village, Anaicut Taluk, Vellore District, Tamil Nadu.
Sample Description	AMBIENT AIR QUALITY
Sampling Procedure	IS – 5182 (Part – 14: 2000 & Part – V: Reaffirmed - 2003), CPCB Guide lines

Sample Location	A1-WITHIN MINE LEASE AREA
Positioned height of Sampler	1.5 M above Ground Level

Customer Reference	As per work order	Sampling Procedure	24 hrs
Sample Reference No	SARL/A/CHE-038	Sample Received on	30.10.2023
Sample Collected by	LABORATORY	Test Commenced on	30.10.2023
Sample Collected Date	24.10.2023	Test Completed on	04.11.2023
Temperature	33°C	Relative Humidity	41%
Sample Condition	Fit for Analysis		

S. No.	Parameters	Protocol	Unit	Results	*Limits
1	Particulate Matter less than 10 micron size (PM_{10})	IS:5182: Part 23:2006	$\mu g/m^3$	60.7	100
2	Particulate Matter less than 2.5 micron size ($PM_{2.5}$)	IS 5182 (Part 24):2019	$\mu g/m^3$	28.6	60
3	Sulphur Dioxide (SO_2)	IS:5182: Part 02:2001	$\mu g/m^3$	4.9	80
4	Nitrogen Dioxide (NO_2)	IS:5182: Part 06:2006	$\mu g/m^3$	9.5	80
5	Carbon Monoxide (CO)	SARL/IOP/013 (Issue No:01, Issue Date – 01.03.2023)	mg/m^3	BDL (D.L – 1.1)	02

Remarks: Limits: *National Ambient air quality standards from CPCB. BDL- Below detectable limit. DL –Detectable limit.

For Shrient Analytical and Research Labs Pvt. Ltd

Verified 04/11/23

Authorized Signatory
J. GNANAPRAKASAM
Technical Manager

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TEST REPORT

Report No.	SARL/23-039	Report Date.	04.11.2023

Customer Name & Address	Project Name: Thiru R. Natarajan - TOR File No 9971 The proposed quarry of Thiru.R.Natarajan survey nos. 253/7, 259/5, 259/2 and 259/4 over an extent of 2.31.50 Ha, Karadikudi Village, Anaicut Taluk, Vellore District, Tamil Nadu.
Sample Description	AMBIENT AIR QUALITY
Sampling Procedure	IS – 5182 (Part – 14: 2000 & Part – V: Reaffirmed - 2003), CPCB Guide lines

Sample Location	A2-THANGAL
Positioned height of Sampler	1.5 M above Ground Level

Customer Reference	As per work order	Sampling Procedure	24 hrs
Sample Reference No	SARL/A/CHE-039	Sample Received on	30.10.2023
Sample Collected by	LABORATORY	Test Commenced on	30.10.2023
Sample Collected Date	24.10.2023	Test Completed on	04.11.2023
Temperature	33°C	Relative Humidity	41%
Sample Condition	Fit for Analysis		

S. No.	Parameters	Protocol	Unit	Results	*Limits
1	Particulate Matter less than 10 micron size (PM_{10})	IS:5182: Part 23:2006	$\mu g/m^3$	49.6	100
2	Particulate Matter less than 2.5 micron size ($PM_{2.5}$)	IS 5182 (Part 24):2019	$\mu g/m^3$	24.2	60
3	Sulphur Dioxide (SO_2)	IS:5182: Part 02:2001	$\mu g/m^3$	4.9	80
4	Nitrogen Dioxide (NO_2)	IS:5182: Part 06:2006	$\mu g/m^3$	7.8	80
5	Carbon Monoxide (CO)	SARL/IOP/013 (Issue No:01, Issue Date – 01.03.2023)	mg/m^3	BDL (D.L – 1.1)	02

Remarks: Limits: *National Ambient air quality standards from CPCB. BDL- Below detectable limit. DL –Detectable limit.

For Shrient Analytical and Research Labs Pvt. Ltd

Verified 04/11/23

Authorized Signatory

J. GNANAPRAKASAM
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Website : www.shrientanalytical.com

TEST REPORT

Report No.	SARL/23-040	Report Date.	04.11.2023

Customer Name & Address	Project Name: Thiru R. Natarajan - TOR File No 9971 The proposed quarry of Thiru.R.Natarajan survey nos. 253/7, 259/5, 259/2 and 259/4 over an extent of 2.31.50 Ha, Karadikudi Village, Anaicut Taluk, Vellore District, Tamil Nadu.
Sample Description	AMBIENT AIR QUALITY
Sampling Procedure	IS – 5182 (Part – 14: 2000 & Part – V: Reaffirmed - 2003), CPCB Guide lines

Sample Location	A1-WITHIN MINE LEASE AREA
Positioned height of Sampler	1.5 M above Ground Level

Customer Reference	As per work order	Sampling Procedure	24 hrs
Sample Reference No	SARL/A/CHE-040	Sample Received on	30.10.2023
Sample Collected by	LABORATORY	Test Commenced on	30.10.2023
Sample Collected Date	25.10.2023	Test Completed on	04.11.2023
Temperature	32°C	Relative Humidity	43%
Sample Condition	Fit for Analysis		

S. No.	Parameters	Protocol	Unit	Results	*Limits
1	Particulate Matter less than 10 micron size (PM_{10})	IS:5182: Part 23:2006	$\mu g/m^3$	52.6	100
2	Particulate Matter less than 2.5 micron size ($PM_{2.5}$)	IS 5182 (Part 24):2019	$\mu g/m^3$	25.1	60
3	Sulphur Dioxide (SO_2)	IS:5182: Part 02:2001	$\mu g/m^3$	6.1	80
4	Nitrogen Dioxide (NO_2)	IS:5182: Part 06:2006	$\mu g/m^3$	10.5	80
5	Carbon Monoxide (CO)	SARL/IOP/013 (Issue No:01, Issue Date – 01.03.2023)	mg/m^3	BDL (D.L – 1.1)	02

Remarks: Limits: *National Ambient air quality standards from CPCB. BDL- Below detectable limit. DL –Detectable limit.

For Shrient Analytical and Research Labs Pvt. Ltd

Verified 04/11/23

Authorized Signatory
J. GNANAPRAKASAM
Technical Manager

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Please Contact:
For any Technical Issues & Complaints: vimalnath@shrientanalytical.com

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TEST REPORT

Report No.	SARL/23-041	Report Date.	04.11.2023

Customer Name & Address	Project Name: Thiru R. Natarajan - TOR File No 9971 The proposed quarry of Thiru.R.Natarajan survey nos. 253/7, 259/5, 259/2 and 259/4 over an extent of 2.31.50 Ha, Karadikudi Village, Anaicut Taluk, Vellore District, Tamil Nadu.
Sample Description	AMBIENT AIR QUALITY
Sampling Procedure	IS – 5182 (Part – 14: 2000 & Part – V: Reaffirmed - 2003), CPCB Guide lines

Sample Location	A2-THANGAL
Positioned height of Sampler	1.5 M above Ground Level

Customer Reference	As per work order	Sampling Procedure	24 hrs
Sample Reference No	SARL/A/CHE-041	Sample Received on	30.10.2023
Sample Collected by	LABORATORY	Test Commenced on	30.10.2023
Sample Collected Date	25.10.2023	Test Completed on	04.11.2023
Temperature	32°C	Relative Humidity	43%
Sample Condition	Fit for Analysis		

S. No.	Parameters	Protocol	Unit	Results	*Limits
1	Particulate Matter less than 10 micron size (PM_{10})	IS:5182: Part 23:2006	$\mu g/m^3$	47.2	100
2	Particulate Matter less than 2.5 micron size ($PM_{2.5}$)	IS 5182 (Part 24):2019	$\mu g/m^3$	20.9	60
3	Sulphur Dioxide (SO_2)	IS:5182: Part 02:2001	$\mu g/m^3$	4.5	80
4	Nitrogen Dioxide (NO_2)	IS:5182: Part 06:2006	$\mu g/m^3$	8.2	80
5	Carbon Monoxide (CO)	SARL/IOP/013 (Issue No:01, Issue Date – 01.03.2023)	mg/m^3	BDL (D.L – 1.1)	02

Remarks: Limits: *National Ambient air quality standards from CPCB. BDL- Below detectable limit. DL –Detectable limit.

For Shrient Analytical and Research Labs Pvt. Ltd

Verified 04/11/2023

Authorized Signatory

J. GNANAPRAKASAM
Technical Manager

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TEST REPORT

Report No.	SARL/23-042

Report Date.	04.11.2023

Customer Name & Address	Project Name: Thiru R. Natarajan - TOR File No 9971 The proposed quarry of Thiru.R.Natarajan survey nos. 253/7, 259/5, 259/2 and 259/4 over an extent of 2.31.50 Ha, Karadikudi Village, Anaicut Taluk, Vellore District, Tamil Nadu.
Sample Description	AMBIENT AIR QUALITY
Sampling Procedure	IS – 5182 (Part – 14: 2000 & Part – V: Reaffirmed - 2003), CPCB Guide lines

Sample Location	A3-PICHANATHAM
Positioned height of Sampler	1.5 M above Ground Level

Customer Reference	As per work order	Sampling Procedure	24 hrs
Sample Reference No	SARL/A/CHE-042	Sample Received on	30.10.2023
Sample Collected by	LABORATORY	Test Commenced on	30.10.2023
Sample Collected Date	26.10.2023	Test Completed on	04.11.2023
Temperature	31°C	Relative Humidity	51%
Sample Condition	Fit for Analysis		

S. No.	Parameters	Protocol	Unit	Results	*Limits
1	Particulate Matter less than 10 micron size (PM_{10})	IS:5182: Part 23:2006	$\mu g/m^3$	52.5	100
2	Particulate Matter less than 2.5 micron size ($PM_{2.5}$)	IS 5182 (Part 24):2019	$\mu g/m^3$	26.2	60
3	Sulphur Dioxide (SO_2)	IS:5182: Part 02:2001	$\mu g/m^3$	4.8	80
4	Nitrogen Dioxide (NO_2)	IS:5182: Part 06:2006	$\mu g/m^3$	6.6	80
5	Carbon Monoxide (CO)	SARL/IOP/013 (Issue No:01, Issue Date – 01.03.2023)	mg/m^3	BDL (D.L – 1.1)	02

Remarks: Limits: *National Ambient air quality standards from CPCB. BDL- Below detectable limit. DL –Detectable limit.

For Shrient Analytical and Research Labs Pvt. Ltd

Verified 04/11/23

Authorized Signatory

J. GNANAPRAKASAM
Technical Manager

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TEST REPORT

Report No.	SARL/23-043

Report Date.	04.11.2023

Customer Name & Address	Project Name: Thiru R. Natarajan - TOR File No 9971 The proposed quarry of Thiru.R.Natarajan survey nos. 253/7, 259/5, 259/2 and 259/4 over an extent of 2.31.50 Ha, Karadikudi Village, Anaicut Taluk, Vellore District, Tamil Nadu.
Sample Description	AMBIENT AIR QUALITY
Sampling Procedure	IS – 5182 (Part – 14: 2000 & Part – V: Reaffirmed - 2003), CPCB Guide lines

Sample Location	A4-KARADIKUDI
Positioned height of Sampler	1.5 M above Ground Level

Customer Reference	As per work order	Sampling Procedure	24 hrs
Sample Reference No	SARL/A/CHE-043	Sample Received on	30.10.2023
Sample Collected by	LABORATORY	Test Commenced on	30.10.2023
Sample Collected Date	26.10.2023	Test Completed on	04.11.2023
Temperature	31°C	Relative Humidity	51%
Sample Condition	Fit for Analysis		

S. No.	Parameters	Protocol	Unit	Results	*Limits
1	Particulate Matter less than 10 micron size (PM_{10})	IS:5182: Part 23:2006	$\mu g/m^3$	50.8	100
2	Particulate Matter less than 2.5 micron size ($PM_{2.5}$)	IS 5182 (Part 24):2019	$\mu g/m^3$	23.1	60
3	Sulphur Dioxide (SO_2)	IS:5182: Part 02:2001	$\mu g/m^3$	5.8	80
4	Nitrogen Dioxide (NO_2)	IS:5182: Part 06:2006	$\mu g/m^3$	10.7	80
5	Carbon Monoxide (CO)	SARL/IOP/013 (Issue No:01, Issue Date – 01.03.2023)	mg/m^3	BDL (D.L – 1.1)	02

Remarks: Limits: *National Ambient air quality standards from CPCB. BDL- Below detectable limit. DL –Detectable limit.

For Shrient Analytical and Research Labs Pvt. Ltd

Verified 04/11/23

Authorized Signatory

J. GNANAPRAKASAM
Technical Manager

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TEST REPORT

Report No.	SARL/23-038	Report Date.	04.11.2023

Customer Name & Address	Project Name: Thiru R. Natarajan - TOR File No 9971 The proposed quarry of Thiru.R.Natarajan survey nos. 253/7, 259/5, 259/2 and 259/4 over an extent of 2.31.50 Ha, Karadikudi Village, Anaicut Taluk, Vellore District, Tamil Nadu.
Sample Description	AMBIENT AIR QUALITY
Sampling Procedure	IS – 5182 (Part – 14: 2000 & Part – V: Reaffirmed - 2003), CPCB Guide lines

Sample Location	A3-PICHANATHAM
Positioned height of Sampler	1.5 M above Ground Level

Customer Reference	As per work order	Sampling Procedure	24 hrs
Sample Reference No	SARL/A/CHE-044	Sample Received on	30.10.2023
Sample Collected by	LABORATORY	Test Commenced on	30.10.2023
Sample Collected Date	27.10.2023	Test Completed on	04.11.2023
Temperature	32°C	Relative Humidity	48%
Sample Condition	Fit for Analysis		

S. No.	Parameters	Protocol	Unit	Results	*Limits
1	Particulate Matter less than 10 micron size (PM_{10})	IS:5182: Part 23:2006	$\mu g/m^3$	50.1	100
2	Particulate Matter less than 2.5 micron size ($PM_{2.5}$)	IS 5182 (Part 24):2019	$\mu g/m^3$	28.1	60
3	Sulphur Dioxide (SO_2)	IS:5182: Part 02:2001	$\mu g/m^3$	4.6	80
4	Nitrogen Dioxide (NO_2)	IS:5182: Part 06:2006	$\mu g/m^3$	6.8	80
5	Carbon Monoxide (CO)	SARL/IOP/013 (Issue No:01, Issue Date – 01.03.2023)	mg/m^3	BDL (D.L – 1.1)	02

Remarks: Limits: *National Ambient air quality standards from CPCB. BDL- Below detectable limit. DL –Detectable limit.

For Shrient Analytical and Research Labs Pvt. Ltd

Verified 04/11/23

Authorized Signatory

J. GNANAPRAKASAM
Technical Manager

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TEST REPORT

Report No.	SARL/23-045	Report Date.	04.11.2023

Customer Name & Address	Project Name: Thiru R. Natarajan - TOR File No 9971 The proposed quarry of Thiru.R.Natarajan survey nos. 253/7, 259/5, 259/2 and 259/4 over an extent of 2.31.50 Ha, Karadikudi Village, Anaicut Taluk, Vellore District, Tamil Nadu.
Sample Description	AMBIENT AIR QUALITY
Sampling Procedure	IS – 5182 (Part – 14: 2000 & Part – V: Reaffirmed - 2003), CPCB Guide lines

Sample Location	A4-KARADIKUDI
Positioned height of Sampler	1.5 M above Ground Level

Customer Reference	As per work order	Sampling Procedure	24 hrs
Sample Reference No	SARL/A/CHE-045	Sample Received on	30.10.2023
Sample Collected by	LABORATORY	Test Commenced on	30.10.2023
Sample Collected Date	27.10.2023	Test Completed on	04.11.2023
Temperature	32°C	Relative Humidity	48%
Sample Condition	Fit for Analysis		

S. No.	Parameters	Protocol	Unit	Results	*Limits
1	Particulate Matter less than 10 micron size (PM_{10})	IS:5182: Part 23:2006	$\mu g/m^3$	54.4	100
2	Particulate Matter less than 2.5 micron size ($PM_{2.5}$)	IS 5182 (Part 24):2019	$\mu g/m^3$	24.7	60
3	Sulphur Dioxide (SO_2)	IS:5182: Part 02:2001	$\mu g/m^3$	6.7	80
4	Nitrogen Dioxide (NO_2)	IS:5182: Part 06:2006	$\mu g/m^3$	10.9	80
5	Carbon Monoxide (CO)	SARL/IOP/013 (Issue No:01, Issue Date – 01.03.2023)	mg/m^3	BDL (D.L – 1.1)	02

Remarks: Limits: *National Ambient air quality standards from CPCB. BDL- Below detectable limit. DL –Detectable limit.

For Shrient Analytical and Research Labs Pvt. Ltd

Verified 04/11/23

Authorized Signatory
J. GNANAPRAKASAM
Technical Manager

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TEST REPORT

Report No.	SARL/23-046	Report Date.	04.11.2023

Customer Name & Address	Project Name: Thiru R. Natarajan - TOR File No 9971 The proposed quarry of Thiru.R.Natarajan survey nos. 253/7, 259/5, 259/2 and 259/4 over an extent of 2.31.50 Ha, Karadikudi Village, Anaicut Taluk, Vellore District, Tamil Nadu.
Sample Description	AMBIENT AIR QUALITY
Sampling Procedure	IS – 5182 (Part – 14: 2000 & Part – V: Reaffirmed - 2003), CPCB Guide lines

Sample Location	A5-ODIYATHUR
Positioned height of Sampler	1.5 M above Ground Level

Customer Reference	As per work order	Sampling Procedure	24 hrs
Sample Reference No	SARL/A/CHE-046	Sample Received on	30.10.2023
Sample Collected by	LABORATORY	Test Commenced on	30.10.2023
Sample Collected Date	28.10.2023	Test Completed on	04.11.2023
Temperature	31°C	Relative Humidity	54%
Sample Condition	Fit for Analysis		

S. No.	Parameters	Protocol	Unit	Results	*Limits
1	Particulate Matter less than 10 micron size (PM_{10})	IS:5182: Part 23:2006	$\mu g/m^3$	49.4	100
2	Particulate Matter less than 2.5 micron size ($PM_{2.5}$)	IS 5182 (Part 24):2019	$\mu g/m^3$	22.7	60
3	Sulphur Dioxide (SO_2)	IS:5182: Part 02:2001	$\mu g/m^3$	7.6	80
4	Nitrogen Dioxide (NO_2)	IS:5182: Part 06:2006	$\mu g/m^3$	9.3	80
5	Carbon Monoxide (CO)	SARL/IOP/013 (Issue No:01, Issue Date – 01.03.2023)	mg/m^3	BDL (D.L – 1.1)	02

Remarks: Limits: *National Ambient air quality standards from CPCB. BDL- Below detectable limit. DL –Detectable limit.

For Shrient Analytical and Research Labs Pvt. Ltd

Verified 04/11/23

Authorized Signatory
J. GNANAPRAKASAM
Technical Manager

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TEST REPORT

Report No.	SARL/23-047	Report Date.	04.11.2023

Customer Name & Address	Project Name: Thiru R. Natarajan - TOR File No 9971 The proposed quarry of Thiru.R.Natarajan survey nos. 253/7, 259/5, 259/2 and 259/4 over an extent of 2.31.50 Ha, Karadikudi Village, Anaicut Taluk, Vellore District, Tamil Nadu.
Sample Description	AMBIENT AIR QUALITY
Sampling Procedure	IS – 5182 (Part – 14: 2000 & Part – V: Reaffirmed - 2003), CPCB Guide lines

Sample Location	A6-ANAICUT
Positioned height of Sampler	1.5 M above Ground Level

Customer Reference	As per work order	Sampling Procedure	24 hrs
Sample Reference No	SARL/A/CHE-047	Sample Received on	30.10.2023
Sample Collected by	LABORATORY	Test Commenced on	30.10.2023
Sample Collected Date	28.10.2023	Test Completed on	04.11.2023
Temperature	31°C	Relative Humidity	54%
Sample Condition	Fit for Analysis		

S. No.	Parameters	Protocol	Unit	Results	*Limits
1	Particulate Matter less than 10 micron size (PM_{10})	IS:5182: Part 23:2006	$\mu g/m^3$	51.2	100
2	Particulate Matter less than 2.5 micron size ($PM_{2.5}$)	IS 5182 (Part 24):2019	$\mu g/m^3$	23.1	60
3	Sulphur Dioxide (SO_2)	IS:5182: Part 02:2001	$\mu g/m^3$	4.7	80
4	Nitrogen Dioxide (NO_2)	IS:5182: Part 06:2006	$\mu g/m^3$	7.1	80
5	Carbon Monoxide (CO)	SARL/IOP/013 (Issue No:01, Issue Date – 01.03.2023)	mg/m^3	BDL (D.L – 1.1)	02

Remarks: Limits: *National Ambient air quality standards from CPCB. BDL- Below detectable limit. DL –Detectable limit.

For Shrient Analytical and Research Labs Pvt. Ltd

Verified 04/11/23

Authorized Signatory

J. GNANAPRAKASAM
Technical Manager

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TEST REPORT

Report No.	SARL/23-048

Report Date.	04.11.2023

Customer Name & Address	Project Name: Thiru R. Natarajan - TOR File No 9971 The proposed quarry of Thiru.R.Natarajan survey nos. 253/7, 259/5, 259/2 and 259/4 over an extent of 2.31.50 Ha, Karadikudi Village, Anaicut Taluk, Vellore District, Tamil Nadu.
Sample Description	AMBIENT AIR QUALITY
Sampling Procedure	IS – 5182 (Part – 14: 2000 & Part – V: Reaffirmed - 2003), CPCB Guide lines

Sample Location	A5-ODIYATHUR
Positioned height of Sampler	1.5 M above Ground Level

Customer Reference	As per work order	Sampling Procedure	24 hrs
Sample Reference No	SARL/A/CHE-048	Sample Received on	30.10.2023
Sample Collected by	LABORATORY	Test Commenced on	30.10.2023
Sample Collected Date	29.10.2023	Test Completed on	04.11.2023
Temperature	31°C	Relative Humidity	48%
Sample Condition	Fit for Analysis		

S. No.	Parameters	Protocol	Unit	Results	*Limits
1	Particulate Matter less than 10 micron size (PM_{10})	IS:5182: Part 23:2006	$\mu g/m^3$	52.6	100
2	Particulate Matter less than 2.5 micron size ($PM_{2.5}$)	IS 5182 (Part 24):2019	$\mu g/m^3$	24.2	60
3	Sulphur Dioxide (SO_2)	IS:5182: Part 02:2001	$\mu g/m^3$	4.9	80
4	Nitrogen Dioxide (NO_2)	IS:5182: Part 06:2006	$\mu g/m^3$	10.2	80
5	Carbon Monoxide (CO)	SARL/IOP/013 (Issue No:01, Issue Date – 01.03.2023)	mg/m^3	BDL (D.L – 1.1)	02

Remarks: Limits: *National Ambient air quality standards from CPCB. BDL- Below detectable limit. DL –Detectable limit.

For Shrient Analytical and Research Labs Pvt. Ltd

Verified 04/11/23

Authorized Signatory
J. GNANAPRAKASAM
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Website : www.shrientanalytical.com

TEST REPORT

Report No.	SARL/23-049	Report Date.	04.11.2023

Customer Name & Address	Project Name: Thiru R. Natarajan - TOR File No 9971 The proposed quarry of Thiru.R.Natarajan survey nos. 253/7, 259/5, 259/2 and 259/4 over an extent of 2.31.50 Ha, Karadikudi Village, Anaicut Taluk, Vellore District, Tamil Nadu.
Sample Description	AMBIENT AIR QUALITY
Sampling Procedure	IS – 5182 (Part – 14: 2000 & Part – V: Reaffirmed - 2003), CPCB Guide lines

Sample Location	A6-ANAICUT
Positioned height of Sampler	1.5 M above Ground Level

Customer Reference	As per work order	Sampling Procedure	24 hrs
Sample Reference No	SARL/A/CHE-049	Sample Received on	30.10.2023
Sample Collected by	LABORATORY	Test Commenced on	30.10.2023
Sample Collected Date	29.10.2023	Test Completed on	04.11.2023
Temperature	31°C	Relative Humidity	48%
Sample Condition	Fit for Analysis		

S. No.	Parameters	Protocol	Unit	Results	*Limits
1	Particulate Matter less than 10 micron size (PM_{10})	IS:5182: Part 23:2006	$\mu g/m^3$	44.8	100
2	Particulate Matter less than 2.5 micron size ($PM_{2.5}$)	IS 5182 (Part 24):2019	$\mu g/m^3$	20.2	60
3	Sulphur Dioxide (SO_2)	IS:5182: Part 02:2001	$\mu g/m^3$	5.7	80
4	Nitrogen Dioxide (NO_2)	IS:5182: Part 06:2006	$\mu g/m^3$	8.2	80
5	Carbon Monoxide (CO)	SARL/IOP/013 (Issue No:01, Issue Date – 01.03.2023)	mg/m^3	BDL (D.L – 1.1)	02

Remarks: Limits: *National Ambient air quality standards from CPCB. BDL- Below detectable limit. DL –Detectable limit.

For Shrient Analytical and Research Labs Pvt. Ltd

Verified 04/11/23

Authorized Signatory
J. GNANAPRAKASAM
Technical Manager

END OF THE REPORT

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TEST REPORT

Report No.	SARL/23-050	Report Date.	11.11.2023

Customer Name & Address	Project Name: Thiru R. Natarajan - TOR File No 9971 The proposed quarry of Thiru.R.Natarajan survey nos. 253/7, 259/5, 259/2 and 259/4 over an extent of 2.31.50 Ha, Karadikudi Village, Anaicut Taluk, Vellore District, Tamil Nadu.
Sample Description	AMBIENT AIR QUALITY
Sampling Procedure	IS – 5182 (Part – 14: 2000 & Part – V: Reaffirmed - 2003), CPCB Guide lines

Sample Location	A5-ODIYATHUR
Positioned height of Sampler	1.5 M above Ground Level

Customer Reference	As per work order	Sampling Procedure	24 hrs
Sample Reference No	SARL/A/CHE-050	Sample Received on	06.11.2023
Sample Collected by	LABORATORY	Test Commenced on	06.11.2023
Sample Collected Date	31.10.2023	Test Completed on	11.11.2023
Temperature	29°C	Relative Humidity	66%
Sample Condition	Fit for Analysis		

S. No.	Parameters	Protocol	Unit	Results	*Limits
1	Particulate Matter less than 10 micron size (PM_{10})	IS:5182: Part 23:2006	$\mu g/m^3$	45.4	100
2	Particulate Matter less than 2.5 micron size ($PM_{2.5}$)	IS 5182 (Part 24):2019	$\mu g/m^3$	20.9	60
3	Sulphur Dioxide (SO_2)	IS:5182: Part 02:2001	$\mu g/m^3$	5.2	80
4	Nitrogen Dioxide (NO_2)	IS:5182: Part 06:2006	$\mu g/m^3$	8.5	80
5	Carbon Monoxide (CO)	SARL/IOP/013 (Issue No:01, Issue Date – 01.03.2023)	mg/m^3	BDL (D.L – 1.1)	02

Remarks: Limits: *National Ambient air quality standards from CPCB. BDL- Below detectable limit. DL –Detectable limit.

For Shrient Analytical and Research Labs Pvt. Ltd

Verified 11/11/23

11/11/23

Authorized Signatory
J. GNANAPRAKASAM
Technical Manager

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TEST REPORT

Report No.	SARL/23-051	Report Date.	11.11.2023

Customer Name & Address	Project Name: Thiru R. Natarajan - TOR File No 9971 The proposed quarry of Thiru.R.Natarajan survey nos. 253/7, 259/5, 259/2 and 259/4 over an extent of 2.31.50 Ha, Karadikudi Village, Anaicut Taluk, Vellore District, Tamil Nadu.
Sample Description	AMBIENT AIR QUALITY
Sampling Procedure	IS – 5182 (Part – 14: 2000 & Part – V: Reaffirmed - 2003), CPCB Guide lines

Sample Location	A6-ANAICUT
Positioned height of Sampler	1.5 M above Ground Level

Customer Reference	As per work order	Sampling Procedure	24 hrs
Sample Reference No	SARL/A/CHE-051	Sample Received on	06.11.2023
Sample Collected by	LABORATORY	Test Commenced on	06.11.2023
Sample Collected Date	31.10.2023	Test Completed on	11.11.2023
Temperature	29°C	Relative Humidity	66%
Sample Condition	Fit for Analysis		

S. No.	Parameters	Protocol	Unit	Results	*Limits
1	Particulate Matter less than 10 micron size (PM_{10})	IS:5182: Part 23:2006	$\mu g/m^3$	49.1	100
2	Particulate Matter less than 2.5 micron size ($PM_{2.5}$)	IS 5182 (Part 24):2019	$\mu g/m^3$	22.1	60
3	Sulphur Dioxide (SO_2)	IS:5182: Part 02:2001	$\mu g/m^3$	4.4	80
4	Nitrogen Dioxide (NO_2)	IS:5182: Part 06:2006	$\mu g/m^3$	6.5	80
5	Carbon Monoxide (CO)	SARL/IOP/013 (Issue No:01, Issue Date – 01.03.2023)	mg/m^3	BDL (D.L – 1.1)	02

Remarks: Limits: *National Ambient air quality standards from CPCB. BDL- Below detectable limit. DL –Detectable limit.

For Shrient Analytical and Research Labs Pvt. Ltd

Verified 11/11/23

Authorized Signatory

J. GNANAPRAKASAM
Technical Manager

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TEST REPORT

Report No.	SARL/23-052

Report Date.	11.11.2023

Customer Name & Address	Project Name: Thiru R. Natarajan - TOR File No 9971 The proposed quarry of Thiru.R.Natarajan survey nos. 253/7, 259/5, 259/2 and 259/4 over an extent of 2.31.50 Ha, Karadikudi Village, Anaicut Taluk, Vellore District, Tamil Nadu.
Sample Description	AMBIENT AIR QUALITY
Sampling Procedure	IS – 5182 (Part – 14: 2000 & Part – V: Reaffirmed - 2003), CPCB Guide lines

Sample Location	A5-ODIYATHUR
Positioned height of Sampler	1.5 M above Ground Level

Customer Reference	As per work order	Sampling Procedure	24 hrs
Sample Reference No	SARL/A/CHE-052	Sample Received on	06.11.2023
Sample Collected by	LABORATORY	Test Commenced on	06.11.2023
Sample Collected Date	01.11.2023	Test Completed on	11.11.2023
Temperature	32°C	Relative Humidity	54%
Sample Condition	Fit for Analysis		

S. No.	Parameters	Protocol	Unit	Results	*Limits
1	Particulate Matter less than 10 micron size (PM_{10})	IS:5182: Part 23:2006	$\mu g/m^3$	47.7	100
2	Particulate Matter less than 2.5 micron size ($PM_{2.5}$)	IS 5182 (Part 24):2019	$\mu g/m^3$	21.8	60
3	Sulphur Dioxide (SO_2)	IS:5182: Part 02:2001	$\mu g/m^3$	5.6	80
4	Nitrogen Dioxide (NO_2)	IS:5182: Part 06:2006	$\mu g/m^3$	7.7	80
5	Carbon Monoxide (CO)	SARL/IOP/013 (Issue No:01, Issue Date – 01.03.2023)	mg/m^3	BDL (D.L – 1.1)	02

Remarks: Limits: *National Ambient air quality standards from CPCB. BDL- Below detectable limit. DL –Detectable limit.

For Shrient Analytical and Research Labs Pvt. Ltd

Verified 11/11/23

Shrient Analytical & Research Labs Pvt. Ltd. Chennai - 45

END OF THE REPORT

Authorized Signatory
J. GNANAPRAKASAM
Technical Manager

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TEST REPORT

Report No.	SARL/23-053

Report Date.	11.11.2023

Customer Name & Address	Project Name: Thiru R. Natarajan - TOR File No 9971 The proposed quarry of Thiru.R.Natarajan survey nos. 253/7, 259/5, 259/2 and 259/4 over an extent of 2.31.50 Ha, Karadikudi Village, Anaicut Taluk, Vellore District, Tamil Nadu.
Sample Description	AMBIENT AIR QUALITY
Sampling Procedure	IS – 5182 (Part – 14: 2000 & Part – V: Reaffirmed - 2003), CPCB Guide lines

Sample Location	A6-ANAICUT
Positioned height of Sampler	1.5 M above Ground Level

Customer Reference	As per work order	Sampling Procedure	24 hrs
Sample Reference No	SARL/A/CHE-053	Sample Received on	06.11.2023
Sample Collected by	LABORATORY	Test Commenced on	06.11.2023
Sample Collected Date	01.11.2023	Test Completed on	11.11.2023
Temperature	32°C	Relative Humidity	54%
Sample Condition	Fit for Analysis		

S. No.	Parameters	Protocol	Unit	Results	*Limits
1	Particulate Matter less than 10 micron size (PM_{10})	IS:5182: Part 23:2006	$\mu g/m^3$	44.4	100
2	Particulate Matter less than 2.5 micron size ($PM_{2.5}$)	IS 5182 (Part 24):2019	$\mu g/m^3$	20.4	60
3	Sulphur Dioxide (SO_2)	IS:5182: Part 02:2001	$\mu g/m^3$	4.5	80
4	Nitrogen Dioxide (NO_2)	IS:5182: Part 06:2006	$\mu g/m^3$	6.7	80
5	Carbon Monoxide (CO)	SARL/IOP/013 (Issue No:01, Issue Date – 01.03.2023)	mg/m^3	BDL (D.L – 1.1)	02

Remarks: Limits: *National Ambient air quality standards from CPCB. BDL- Below detectable limit. DL –Detectable limit.

For Shrient Analytical and Research Labs Pvt. Ltd

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Chennai - 45

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Technical Manager

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TEST REPORT

Report No.	SARL/23-054	Report Date.	11.11.2023

Customer Name & Address	Project Name: Thiru R. Natarajan - TOR File No 9971 The proposed quarry of Thiru.R.Natarajan survey nos. 253/7, 259/5, 259/2 and 259/4 over an extent of 2.31.50 Ha, Karadikudi Village, Anaicut Taluk, Vellore District, Tamil Nadu.
Sample Description	AMBIENT AIR QUALITY
Sampling Procedure	IS – 5182 (Part – 14: 2000 & Part – V: Reaffirmed - 2003), CPCB Guide lines

Sample Location	A3-PICHANATHAM
Positioned height of Sampler	1.5 M above Ground Level

Customer Reference	As per work order	Sampling Procedure	24 hrs
Sample Reference No	SARL/A/CHE-054	Sample Received on	06.11.2023
Sample Collected by	LABORATORY	Test Commenced on	06.11.2023
Sample Collected Date	02.11.2023	Test Completed on	11.11.2023
Temperature	30°C	Relative Humidity	66%
Sample Condition	Fit for Analysis		

S. No.	Parameters	Protocol	Unit	Results	*Limits
1	Particulate Matter less than 10 micron size (PM_{10})	IS:5182: Part 23:2006	$\mu g/m^3$	43.2	100
2	Particulate Matter less than 2.5 micron size ($PM_{2.5}$)	IS 5182 (Part 24):2019	$\mu g/m^3$	22.1	60
3	Sulphur Dioxide (SO_2)	IS:5182: Part 02:2001	$\mu g/m^3$	4.0	80
4	Nitrogen Dioxide (NO_2)	IS:5182: Part 06:2006	$\mu g/m^3$	8.4	80
5	Carbon Monoxide (CO)	SARL/IOP/013 (Issue No:01, Issue Date – 01.03.2023)	mg/m^3	BDL (D.L – 1.1)	02

Remarks: Limits: *National Ambient air quality standards from CPCB. BDL- Below detectable limit. DL –Detectable limit.

For Shrient Analytical and Research Labs Pvt. Ltd

Verified 11/11/23

Authorized Signatory
J. GNANAPRAKASAM
Technical Manager

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TEST REPORT

Report No.	SARL/23-055	Report Date.	11.11.2023

Customer Name & Address	Project Name: Thiru R. Natarajan - TOR File No 9971 The proposed quarry of Thiru.R.Natarajan survey nos. 253/7, 259/5, 259/2 and 259/4 over an extent of 2.31.50 Ha, Karadikudi Village, Anaicut Taluk, Vellore District, Tamil Nadu.
Sample Description	AMBIENT AIR QUALITY
Sampling Procedure	IS – 5182 (Part – 14: 2000 & Part – V: Reaffirmed - 2003), CPCB Guide lines

Sample Location	A4-KARADIKUDI
Positioned height of Sampler	1.5 M above Ground Level

Customer Reference	As per work order	Sampling Procedure	24 hrs
Sample Reference No	SARL/A/CHE-055	Sample Received on	06.11.2023
Sample Collected by	LABORATORY	Test Commenced on	06.11.2023
Sample Collected Date	02.11.2023	Test Completed on	11.11.2023
Temperature	30°C	Relative Humidity	66%
Sample Condition	Fit for Analysis		

S. No.	Parameters	Protocol	Unit	Results	*Limits
1	Particulate Matter less than 10 micron size (PM_{10})	IS:5182: Part 23:2006	$\mu g/m^3$	46.4	100
2	Particulate Matter less than 2.5 micron size ($PM_{2.5}$)	IS 5182 (Part 24):2019	$\mu g/m^3$	22.1	60
3	Sulphur Dioxide (SO_2)	IS:5182: Part 02:2001	$\mu g/m^3$	6.1	80
4	Nitrogen Dioxide (NO_2)	IS:5182: Part 06:2006	$\mu g/m^3$	9.6	80
5	Carbon Monoxide (CO)	SARL/IOP/013 (Issue No:01, Issue Date – 01.03.2023)	mg/m^3	BDL (D.L – 1.1)	02

Remarks: Limits: *National Ambient air quality standards from CPCB. BDL- Below detectable limit. DL –Detectable limit.

For Shrient Analytical and Research Labs Pvt. Ltd

Verified 11/11/23

Authorized Signatory
J. GNANAPRAKASAM
Technical Manager

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TEST REPORT

Report No.	SARL/23-056	Report Date.	11.11.2023

Customer Name & Address	Project Name: Thiru R. Natarajan - TOR File No 9971 The proposed quarry of Thiru.R.Natarajan survey nos. 253/7, 259/5, 259/2 and 259/4 over an extent of 2.31.50 Ha, Karadikudi Village, Anaicut Taluk, Vellore District, Tamil Nadu.
Sample Description	AMBIENT AIR QUALITY
Sampling Procedure	IS – 5182 (Part – 14: 2000 & Part – V: Reaffirmed - 2003), CPCB Guide lines

Sample Location	A3-PICHANATHAM
Positioned height of Sampler	1.5 M above Ground Level

Customer Reference	As per work order	Sampling Procedure	24 hrs
Sample Reference No	SARL/A/CHE-056	Sample Received on	06.11.2023
Sample Collected by	LABORATORY	Test Commenced on	06.11.2023
Sample Collected Date	03.11.2023	Test Completed on	11.11.2023
Temperature	30°C	Relative Humidity	68%
Sample Condition	Fit for Analysis		

S. No.	Parameters	Protocol	Unit	Results	*Limits
1	Particulate Matter less than 10 micron size (PM_{10})	IS:5182: Part 23:2006	$\mu g/m^3$	47.2	100
2	Particulate Matter less than 2.5 micron size ($PM_{2.5}$)	IS 5182 (Part 24):2019	$\mu g/m^3$	24.3	60
3	Sulphur Dioxide (SO_2)	IS:5182: Part 02:2001	$\mu g/m^3$	5.4	80
4	Nitrogen Dioxide (NO_2)	IS:5182: Part 06:2006	$\mu g/m^3$	6.8	80
5	Carbon Monoxide (CO)	SARL/IOP/013 (Issue No:01, Issue Date – 01.03.2023)	mg/m^3	BDL (D.L – 1.1)	02

Remarks: Limits: *National Ambient air quality standards from CPCB. BDL- Below detectable limit. DL –Detectable limit.

For Shrient Analytical and Research Labs Pvt. Ltd

Verified 11/11/23

Shrient Analytical & Research Labs Pvt. Ltd. Chennai - 45

Authorized Signatory

J. GNANAPRAKASAM
Technical Mana

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TEST REPORT

Report No.	SARL/23-057	Report Date.	11.11.2023

Customer Name & Address	Project Name: Thiru R. Natarajan - TOR File No 9971 The proposed quarry of Thiru.R.Natarajan survey nos. 253/7, 259/5, 259/2 and 259/4 over an extent of 2.31.50 Ha, Karadikudi Village, Anaicut Taluk, Vellore District, Tamil Nadu.
Sample Description	AMBIENT AIR QUALITY
Sampling Procedure	IS – 5182 (Part – 14: 2000 & Part – V: Reaffirmed - 2003), CPCB Guide lines

Sample Location	A4-KARADIKUDI
Positioned height of Sampler	1.5 M above Ground Level

Customer Reference	As per work order	Sampling Procedure	24 hrs
Sample Reference No	SARL/A/CHE-057	Sample Received on	06.11.2023
Sample Collected by	LABORATORY	Test Commenced on	06.11.2023
Sample Collected Date	03.11.2023	Test Completed on	11.11.2023
Temperature	30°C	Relative Humidity	68%
Sample Condition	Fit for Analysis		

S. No.	Parameters	Protocol	Unit	Results	*Limits
1	Particulate Matter less than 10 micron size (PM_{10})	IS:5182: Part 23:2006	$\mu g/m^3$	47.1	100
2	Particulate Matter less than 2.5 micron size ($PM_{2.5}$)	IS 5182 (Part 24):2019	$\mu g/m^3$	21.1	60
3	Sulphur Dioxide (SO_2)	IS:5182: Part 02:2001	$\mu g/m^3$	6.6	80
4	Nitrogen Dioxide (NO_2)	IS:5182: Part 06:2006	$\mu g/m^3$	8.3	80
5	Carbon Monoxide (CO)	SARL/IOP/013 (Issue No:01, Issue Date – 01.03.2023)	mg/m^3	BDL (D.L – 1.1)	02

Remarks: Limits: *National Ambient air quality standards from CPCB. BDL- Below detectable limit. DL –Detectable limit.

For Shrient Analytical and Research Labs Pvt. Ltd

Verified 11/11/23

Shrient Analytical & Research Labs Pvt. Ltd. Chennai - 45

END OF THE REPORT

Authorized Signatory

J. GNANAPRAKASAM
Technical Manager

Please Contact:
For any Technical Issues & Complaints: vimalnath@shrientanalytical.com

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Website : www.shrientanalytical.com

TEST REPORT

Report No.	SARL/23-058

Report Date.	11.11.2023

Customer Name & Address	Project Name: Thiru R. Natarajan - TOR File No 9971 The proposed quarry of Thiru.R.Natarajan survey nos. 253/7, 259/5, 259/2 and 259/4 over an extent of 2.31.50 Ha, Karadikudi Village, Anaicut Taluk, Vellore District, Tamil Nadu.
Sample Description	AMBIENT AIR QUALITY
Sampling Procedure	IS – 5182 (Part – 14: 2000 & Part – V: Reaffirmed - 2003), CPCB Guide lines

Sample Location	A1-WITHIN MINE LEASE AREA
Positioned height of Sampler	1.5 M above Ground Level

Customer Reference	As per work order	Sampling Procedure	24 hrs
Sample Reference No	SARL/A/CHE-058	Sample Received on	06.11.2023
Sample Collected by	LABORATORY	Test Commenced on	06.11.2023
Sample Collected Date	04.11.2023	Test Completed on	11.11.2023
Temperature	28°C	Relative Humidity	75%
Sample Condition	Fit for Analysis		

S. No.	Parameters	Protocol	Unit	Results	*Limits
1	Particulate Matter less than 10 micron size (PM_{10})	IS:5182: Part 23:2006	$\mu g/m^3$	58.4	100
2	Particulate Matter less than 2.5 micron size ($PM_{2.5}$)	IS 5182 (Part 24):2019	$\mu g/m^3$	29.2	60
3	Sulphur Dioxide (SO_2)	IS:5182: Part 02:2001	$\mu g/m^3$	4.7	80
4	Nitrogen Dioxide (NO_2)	IS:5182: Part 06:2006	$\mu g/m^3$	8.7	80
5	Carbon Monoxide (CO)	SARL/IOP/013 (Issue No:01, Issue Date – 01.03.2023)	mg/m^3	BDL (D.L – 1.1)	02

Remarks: Limits: *National Ambient air quality standards from CPCB. BDL- Below detectable limit. DL –Detectable limit.

For Shrient Analytical and Research Labs Pvt. Ltd

Verified 11/11/23

Authorized Signatory
J. GNANAPRAKASAM
Technical Manager

Shrient Analytical & Research Labs Pvt. Ltd. Chennai - 45

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TEST REPORT

Report No.	SARL/23-059	Report Date.	11.11.2023

Customer Name & Address	Project Name: Thiru R. Natarajan - TOR File No 9971 The proposed quarry of Thiru.R.Natarajan survey nos. 253/7, 259/5, 259/2 and 259/4 over an extent of 2.31.50 Ha, Karadikudi Village, Anaicut Taluk, Vellore District, Tamil Nadu.
Sample Description	AMBIENT AIR QUALITY
Sampling Procedure	IS – 5182 (Part – 14: 2000 & Part – V: Reaffirmed - 2003), CPCB Guide lines

Sample Location	A2-THANGAL
Positioned height of Sampler	1.5 M above Ground Level

Customer Reference	As per work order	Sampling Procedure	24 hrs
Sample Reference No	SARL/A/CHE-059	Sample Received on	06.11.2023
Sample Collected by	LABORATORY	Test Commenced on	06.11.2023
Sample Collected Date	04.11.2023	Test Completed on	11.11.2023
Temperature	28°C	Relative Humidity	75%
Sample Condition	Fit for Analysis		

S. No.	Parameters	Protocol	Unit	Results	*Limits
1	Particulate Matter less than 10 micron size (PM_{10})	IS:5182: Part 23:2006	$\mu g/m^3$	46.3	100
2	Particulate Matter less than 2.5 micron size ($PM_{2.5}$)	IS 5182 (Part 24):2019	$\mu g/m^3$	23.9	60
3	Sulphur Dioxide (SO_2)	IS:5182: Part 02:2001	$\mu g/m^3$	5.1	80
4	Nitrogen Dioxide (NO_2)	IS:5182: Part 06:2006	$\mu g/m^3$	7.9	80
5	Carbon Monoxide (CO)	SARL/IOP/013 (Issue No:01, Issue Date – 01.03.2023)	mg/m^3	BDL (D.L – 1.1)	02

Remarks: Limits: *National Ambient air quality standards from CPCB. BDL- Below detectable limit. DL –Detectable limit.

For Shrient Analytical and Research Labs Pvt. Ltd

Verified 11/11/23

Authorized Signatory

J. GNANAPRAKASAM
Technical Manager

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TEST REPORT

Report No.	SARL/23-060	Report Date.	11.11.2023

Customer Name & Address	Project Name: Thiru R. Natarajan - TOR File No 9971 The proposed quarry of Thiru.R.Natarajan survey nos. 253/7, 259/5, 259/2 and 259/4 over an extent of 2.31.50 Ha, Karadikudi Village, Anaicut Taluk, Vellore District, Tamil Nadu.
Sample Description	AMBIENT AIR QUALITY
Sampling Procedure	IS – 5182 (Part – 14: 2000 & Part – V: Reaffirmed - 2003), CPCB Guide lines

Sample Location	A1-WITHIN MINE LEASE AREA
Positioned height of Sampler	1.5 M above Ground Level

Customer Reference	As per work order	Sampling Procedure	24 hrs
Sample Reference No	SARL/A/CHE-060	Sample Received on	06.11.2023
Sample Collected by	LABORATORY	Test Commenced on	06.11.2023
Sample Collected Date	05.11.2023	Test Completed on	11.11.2023
Temperature	26°C	Relative Humidity	81%
Sample Condition	Fit for Analysis		

S. No.	Parameters	Protocol	Unit	Results	*Limits
1	Particulate Matter less than 10 micron size (PM_{10})	IS:5182: Part 23:2006	$\mu g/m^3$	53.3	100
2	Particulate Matter less than 2.5 micron size ($PM_{2.5}$)	IS 5182 (Part 24):2019	$\mu g/m^3$	25.9	60
3	Sulphur Dioxide (SO_2)	IS:5182: Part 02:2001	$\mu g/m^3$	4.8	80
4	Nitrogen Dioxide (NO_2)	IS:5182: Part 06:2006	$\mu g/m^3$	9.1	80
5	Carbon Monoxide (CO)	SARL/IOP/013 (Issue No:01, Issue Date – 01.03.2023)	mg/m^3	BDL (D.L – 1.1)	02

Remarks: Limits: *National Ambient air quality standards from CPCB. BDL- Below detectable limit. DL –Detectable limit.

For Shrient Analytical and Research Labs Pvt. Ltd

Verified 11/11/23

Authorized Signatory
J. GNANAPRAKASAM
Technical Manager

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TEST REPORT

Report No.	SARL/23-061	Report Date.	11.11.2023

Customer Name & Address	Project Name: Thiru R. Natarajan - TOR File No 9971 The proposed quarry of Thiru.R.Natarajan survey nos. 253/7, 259/5, 259/2 and 259/4 over an extent of 2.31.50 Ha, Karadikudi Village, Anaicut Taluk, Vellore District, Tamil Nadu.
Sample Description	AMBIENT AIR QUALITY
Sampling Procedure	IS – 5182 (Part – 14: 2000 & Part – V: Reaffirmed - 2003), CPCB Guide lines

Sample Location	A2-THANGAL
Positioned height of Sampler	1.5 M above Ground Level

Customer Reference	As per work order	Sampling Procedure	24 hrs
Sample Reference No	SARL/A/CHE-061	Sample Received on	06.11.2023
Sample Collected by	LABORATORY	Test Commenced on	06.11.2023
Sample Collected Date	05.11.2023	Test Completed on	11.11.2023
Temperature	26°C	Relative Humidity	81%
Sample Condition	Fit for Analysis		

S. No.	Parameters	Protocol	Unit	Results	*Limits
1	Particulate Matter less than 10 micron size (PM_{10})	IS:5182: Part 23:2006	$\mu g/m^3$	47.9	100
2	Particulate Matter less than 2.5 micron size ($PM_{2.5}$)	IS 5182 (Part 24):2019	$\mu g/m^3$	22.9	60
3	Sulphur Dioxide (SO_2)	IS:5182: Part 02:2001	$\mu g/m^3$	4.7	80
4	Nitrogen Dioxide (NO_2)	IS:5182: Part 06:2006	$\mu g/m^3$	9.1	80
5	Carbon Monoxide (CO)	SARL/IOP/013 (Issue No:01, Issue Date – 01.03.2023)	mg/m^3	BDL (D.L – 1.1)	02

Remarks: Limits: *National Ambient air quality standards from CPCB. BDL- Below detectable limit. DL –Detectable limit.

For Shrient Analytical and Research Labs Pvt. Ltd

Verified 11/11/23

Authorized Signatory

J. GNANAPRAKASAM
Technical Manager

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TEST REPORT

Report No.	SARL/23-062	Report Date.	18.11.2023

Customer Name & Address	Project Name: Thiru R. Natarajan - TOR File No 9971 The proposed quarry of Thiru.R.Natarajan survey nos. 253/7, 259/5, 259/2 and 259/4 over an extent of 2.31.50 Ha, Karadikudi Village, Anaicut Taluk, Vellore District, Tamil Nadu.
Sample Description	AMBIENT AIR QUALITY
Sampling Procedure	IS – 5182 (Part – 14: 2000 & Part – V: Reaffirmed - 2003), CPCB Guide lines

Sample Location	A1-WITHIN MINE LEASE AREA
Positioned height of Sampler	1.5 M above Ground Level

Customer Reference	As per work order	Sampling Procedure	24 hrs
Sample Reference No	SARL/A/CHE-062	Sample Received on	13.11.2023
Sample Collected by	LABORATORY	Test Commenced on	13.11.2023
Sample Collected Date	07.11.2023	Test Completed on	18.11.2023
Temperature	28°C	Relative Humidity	77%
Sample Condition	Fit for Analysis		

S. No.	Parameters	Protocol	Unit	Results	*Limits
1	Particulate Matter less than 10 micron size (PM_{10})	IS:5182: Part 23:2006	$\mu g/m^3$	61.5	100
2	Particulate Matter less than 2.5 micron size ($PM_{2.5}$)	IS 5182 (Part 24):2019	$\mu g/m^3$	28.2	60
3	Sulphur Dioxide (SO_2)	IS:5182: Part 02:2001	$\mu g/m^3$	4.6	80
4	Nitrogen Dioxide (NO_2)	IS:5182: Part 06:2006	$\mu g/m^3$	9.5	80
5	Carbon Monoxide (CO)	SARL/IOP/013 (Issue No:01, Issue Date – 01.03.2023)	mg/m^3	BDL (D.L – 1.1)	02

Remarks: Limits: *National Ambient air quality standards from CPCB. BDL- Below detectable limit. DL –Detectable limit.

For Shrient Analytical and Research Labs Pvt. Ltd

Verified 18/11/23

Authorized Signatory
J. GNANAPRAKASAM
Technical Manager

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Please Contact:
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TEST REPORT

Report No.	SARL/23-063

Report Date.	18.11.2023

Customer Name & Address	Project Name: Thiru R. Natarajan - TOR File No 9971 The proposed quarry of Thiru.R.Natarajan survey nos. 253/7, 259/5, 259/2 and 259/4 over an extent of 2.31.50 Ha, Karadikudi Village, Anaicut Taluk, Vellore District, Tamil Nadu.
Sample Description	AMBIENT AIR QUALITY
Sampling Procedure	IS – 5182 (Part – 14: 2000 & Part – V: Reaffirmed - 2003), CPCB Guide lines

Sample Location	A2-THANGAL
Positioned height of Sampler	1.5 M above Ground Level

Customer Reference	As per work order	Sampling Procedure	24 hrs
Sample Reference No	SARL/A/CHE-063	Sample Received on	13.11.2023
Sample Collected by	LABORATORY	Test Commenced on	13.11.2023
Sample Collected Date	07.11.2023	Test Completed on	18.11.2023
Temperature	28°C	Relative Humidity	77%
Sample Condition	Fit for Analysis		

S. No.	Parameters	Protocol	Unit	Results	*Limits
1	Particulate Matter less than 10 micron size (PM_{10})	IS:5182: Part 23:2006	$\mu g/m^3$	49.3	100
2	Particulate Matter less than 2.5 micron size ($PM_{2.5}$)	IS 5182 (Part 24):2019	$\mu g/m^3$	24.7	60
3	Sulphur Dioxide (SO_2)	IS:5182: Part 02:2001	$\mu g/m^3$	4.2	80
4	Nitrogen Dioxide (NO_2)	IS:5182: Part 06:2006	$\mu g/m^3$	8.9	80
5	Carbon Monoxide (CO)	SARL/IOP/013 (Issue No:01, Issue Date – 01.03.2023)	mg/m^3	BDL (D.L – 1.1)	02

Remarks: Limits: *National Ambient air quality standards from CPCB. BDL- Below detectable limit. DL –Detectable limit.

For Shrient Analytical and Research Labs Pvt. Ltd

Verified 18/11/23

Authorized Signatory
J. GNANAPRAKASAM
Technical Manager

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TEST REPORT

Report No.	SARL/23-064	Report Date.	18.11.2023

Customer Name & Address	Project Name: Thiru R. Natarajan - TOR File No 9971 The proposed quarry of Thiru.R.Natarajan survey nos. 253/7, 259/5, 259/2 and 259/4 over an extent of 2.31.50 Ha, Karadikudi Village, Anaicut Taluk, Vellore District, Tamil Nadu.
Sample Description	AMBIENT AIR QUALITY
Sampling Procedure	IS – 5182 (Part – 14: 2000 & Part – V: Reaffirmed - 2003), CPCB Guide lines

Sample Location	A1-WITHIN MINE LEASE AREA
Positioned height of Sampler	1.5 M above Ground Level

Customer Reference	As per work order	Sampling Procedure	24 hrs
Sample Reference No	SARL/A/CHE-064	Sample Received on	13.11.2023
Sample Collected by	LABORATORY	Test Commenced on	13.11.2023
Sample Collected Date	08.11.2023	Test Completed on	18.11.2023
Temperature	26°C	Relative Humidity	86%
Sample Condition	Fit for Analysis		

S. No.	Parameters	Protocol	Unit	Results	*Limits
1	Particulate Matter less than 10 micron size (PM_{10})	IS:5182: Part 23:2006	$\mu g/m^3$	55.9	100
2	Particulate Matter less than 2.5 micron size ($PM_{2.5}$)	IS 5182 (Part 24):2019	$\mu g/m^3$	24.8	60
3	Sulphur Dioxide (SO_2)	IS:5182: Part 02:2001	$\mu g/m^3$	4.8	80
4	Nitrogen Dioxide (NO_2)	IS:5182: Part 06:2006	$\mu g/m^3$	8.8	80
5	Carbon Monoxide (CO)	SARL/IOP/013 (Issue No:01, Issue Date – 01.03.2023)	mg/m^3	BDL (D.L – 1.1)	02

Remarks: Limits: *National Ambient air quality standards from CPCB. BDL- Below detectable limit. DL –Detectable limit.

For Shrient Analytical and Research Labs Pvt. Ltd

Verified 18/11/23

Authorized Signatory

J. GNANAPRAKASAM
Technical Manager

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TEST REPORT

Report No.	SARL/23-065	Report Date.	18.11.2023

Customer Name & Address	Project Name: Thiru R. Natarajan - TOR File No 9971 The proposed quarry of Thiru.R.Natarajan survey nos. 253/7, 259/5, 259/2 and 259/4 over an extent of 2.31.50 Ha, Karadikudi Village, Anaicut Taluk, Vellore District, Tamil Nadu.
Sample Description	AMBIENT AIR QUALITY
Sampling Procedure	IS – 5182 (Part – 14: 2000 & Part – V: Reaffirmed - 2003), CPCB Guide lines

Sample Location	A2-THANGAL
Positioned height of Sampler	1.5 M above Ground Level

Customer Reference	As per work order	Sampling Procedure	24 hrs
Sample Reference No	SARL/A/CHE-065	Sample Received on	13.11.2023
Sample Collected by	LABORATORY	Test Commenced on	13.11.2023
Sample Collected Date	08.11.2023	Test Completed on	18.11.2023
Temperature	26°C	Relative Humidity	86%
Sample Condition	Fit for Analysis		

S. No.	Parameters	Protocol	Unit	Results	*Limits
1	Particulate Matter less than 10 micron size (PM_{10})	IS:5182: Part 23:2006	$\mu g/m^3$	46.5	100
2	Particulate Matter less than 2.5 micron size ($PM_{2.5}$)	IS 5182 (Part 24):2019	$\mu g/m^3$	23.1	60
3	Sulphur Dioxide (SO_2)	IS:5182: Part 02:2001	$\mu g/m^3$	4.8	80
4	Nitrogen Dioxide (NO_2)	IS:5182: Part 06:2006	$\mu g/m^3$	8.2	80
5	Carbon Monoxide (CO)	SARL/IOP/013 (Issue No:01, Issue Date – 01.03.2023)	mg/m^3	BDL (D.L – 1.1)	02

Remarks: Limits: *National Ambient air quality standards from CPCB. BDL- Below detectable limit. DL –Detectable limit.

For Shrient Analytical and Research Labs Pvt. Ltd

Verified 18/11/23

END OF THE REPORT

Authorized Signatory
J. GNANAPRAKASAM
Technical Manager

Please Contact:
For any Technical Issues & Complaints: vimalnath@shrientanalytical.com

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TEST REPORT

Report No.	SARL/23-066	Report Date.	18.11.2023

Customer Name & Address	Project Name: Thiru R. Natarajan - TOR File No 9971 The proposed quarry of Thiru.R.Natarajan survey nos. 253/7, 259/5, 259/2 and 259/4 over an extent of 2.31.50 Ha, Karadikudi Village, Anaicut Taluk, Vellore District, Tamil Nadu.
Sample Description	AMBIENT AIR QUALITY
Sampling Procedure	IS – 5182 (Part – 14: 2000 & Part – V: Reaffirmed - 2003), CPCB Guide lines

Sample Location	A3-PICHANATHAM
Positioned height of Sampler	1.5 M above Ground Level

Customer Reference	As per work order	Sampling Procedure	24 hrs
Sample Reference No	SARL/A/CHE-066	Sample Received on	13.11.2023
Sample Collected by	LABORATORY	Test Commenced on	13.11.2023
Sample Collected Date	09.11.2023	Test Completed on	18.11.2023
Temperature	30°C	Relative Humidity	64%
Sample Condition	Fit for Analysis		

S. No.	Parameters	Protocol	Unit	Results	*Limits
1	Particulate Matter less than 10 micron size (PM_{10})	IS:5182: Part 23:2006	$\mu g/m^3$	42.1	100
2	Particulate Matter less than 2.5 micron size ($PM_{2.5}$)	IS 5182 (Part 24):2019	$\mu g/m^3$	22.2	60
3	Sulphur Dioxide (SO_2)	IS:5182: Part 02:2001	$\mu g/m^3$	4.3	80
4	Nitrogen Dioxide (NO_2)	IS:5182: Part 06:2006	$\mu g/m^3$	6.9	80
5	Carbon Monoxide (CO)	SARL/IOP/013 (Issue No:01, Issue Date – 01.03.2023)	mg/m^3	BDL (D.L – 1.1)	02

Remarks: Limits: *National Ambient air quality standards from CPCB. BDL- Below detectable limit. DL –Detectable limit.

For Shrient Analytical and Research Labs Pvt. Ltd

Verified 18/11/23

Authorized Signatory
J. GNANAPRAKASAM
Technical Manager
18/11/23

END OF THE REPORT

Please Contact:
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TEST REPORT

Report No.	SARL/23-067	Report Date.	18.11.2023

Customer Name & Address	Project Name: Thiru R. Natarajan - TOR File No 9971 The proposed quarry of Thiru.R.Natarajan survey nos. 253/7, 259/5, 259/2 and 259/4 over an extent of 2.31.50 Ha, Karadikudi Village, Anaicut Taluk, Vellore District, Tamil Nadu.
Sample Description	AMBIENT AIR QUALITY
Sampling Procedure	IS – 5182 (Part – 14: 2000 & Part – V: Reaffirmed - 2003), CPCB Guide lines

Sample Location	A4-KARADIKUDI
Positioned height of Sampler	1.5 M above Ground Level

Customer Reference	As per work order	Sampling Procedure	24 hrs
Sample Reference No	SARL/A/CHE-067	Sample Received on	13.11.2023
Sample Collected by	LABORATORY	Test Commenced on	13.11.2023
Sample Collected Date	09.11.2023	Test Completed on	18.11.2023
Temperature	30°C	Relative Humidity	64%
Sample Condition	Fit for Analysis		

S. No.	Parameters	Protocol	Unit	Results	*Limits
1	Particulate Matter less than 10 micron size (PM_{10})	IS:5182: Part 23:2006	$\mu g/m^3$	49.4	100
2	Particulate Matter less than 2.5 micron size ($PM_{2.5}$)	IS 5182 (Part 24):2019	$\mu g/m^3$	22.3	60
3	Sulphur Dioxide (SO_2)	IS:5182: Part 02:2001	$\mu g/m^3$	7.2	80
4	Nitrogen Dioxide (NO_2)	IS:5182: Part 06:2006	$\mu g/m^3$	9.7	80
5	Carbon Monoxide (CO)	SARL/IOP/013 (Issue No:01, Issue Date – 01.03.2023)	mg/m^3	BDL (D.L – 1.1)	02

Remarks: Limits: *National Ambient air quality standards from CPCB. BDL- Below detectable limit. DL –Detectable limit.

For Shrient Analytical and Research Labs Pvt. Ltd

Verified 18/11/23

Authorized Signatory
J. GNANAPRAKASAM
Technical Manager

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TEST REPORT

Report No.	SARL/23-068

Report Date.	18.11.2023

Customer Name & Address	Project Name: Thiru R. Natarajan - TOR File No 9971 The proposed quarry of Thiru.R.Natarajan survey nos. 253/7, 259/5, 259/2 and 259/4 over an extent of 2.31.50 Ha, Karadikudi Village, Anaicut Taluk, Vellore District, Tamil Nadu.
Sample Description	AMBIENT AIR QUALITY
Sampling Procedure	IS – 5182 (Part – 14: 2000 & Part – V: Reaffirmed - 2003), CPCB Guide lines

Sample Location	A3-PICHANATHAM
Positioned height of Sampler	1.5 M above Ground Level

Customer Reference	As per work order	Sampling Procedure	24 hrs
Sample Reference No	SARL/A/CHE-068	Sample Received on	13.11.2023
Sample Collected by	LABORATORY	Test Commenced on	13.11.2023
Sample Collected Date	10.11.2023	Test Completed on	18.11.2023
Temperature	28°C	Relative Humidity	75%
Sample Condition	Fit for Analysis		

S. No.	Parameters	Protocol	Unit	Results	*Limits
1	Particulate Matter less than 10 micron size (PM_{10})	IS:5182: Part 23:2006	$\mu g/m^3$	48.2	100
2	Particulate Matter less than 2.5 micron size ($PM_{2.5}$)	IS 5182 (Part 24):2019	$\mu g/m^3$	26.3	60
3	Sulphur Dioxide (SO_2)	IS:5182: Part 02:2001	$\mu g/m^3$	4.1	80
4	Nitrogen Dioxide (NO_2)	IS:5182: Part 06:2006	$\mu g/m^3$	8.4	80
5	Carbon Monoxide (CO)	SARL/IOP/013 (Issue No:01, Issue Date – 01.03.2023)	mg/m^3	BDL (D.L – 1.1)	02

Remarks: Limits: *National Ambient air quality standards from CPCB. BDL- Below detectable limit. DL –Detectable limit.

For Shrient Analytical and Research Labs Pvt. Ltd

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Authorized Signatory
J. GNANAPRAKASAM
Technical Manager

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TEST REPORT

Report No.	SARL/23-069	Report Date.	18.11.2023

Customer Name & Address	Project Name: Thiru R. Natarajan - TOR File No 9971 The proposed quarry of Thiru.R.Natarajan survey nos. 253/7, 259/5, 259/2 and 259/4 over an extent of 2.31.50 Ha, Karadikudi Village, Anaicut Taluk, Vellore District, Tamil Nadu.
Sample Description	AMBIENT AIR QUALITY
Sampling Procedure	IS – 5182 (Part – 14: 2000 & Part – V: Reaffirmed - 2003), CPCB Guide lines

Sample Location	A4-KARADIKUDI
Positioned height of Sampler	1.5 M above Ground Level

Customer Reference	As per work order	Sampling Procedure	24 hrs
Sample Reference No	SARL/A/CHE-069	Sample Received on	13.11.2023
Sample Collected by	LABORATORY	Test Commenced on	13.11.2023
Sample Collected Date	10.11.2023	Test Completed on	18.11.2023
Temperature	28°C	Relative Humidity	75%
Sample Condition	Fit for Analysis		

S. No.	Parameters	Protocol	Unit	Results	*Limits
1	Particulate Matter less than 10 micron size (PM_{10})	IS:5182: Part 23:2006	$\mu g/m^3$	45.9	100
2	Particulate Matter less than 2.5 micron size ($PM_{2.5}$)	IS 5182 (Part 24):2019	$\mu g/m^3$	21.9	60
3	Sulphur Dioxide (SO_2)	IS:5182: Part 02:2001	$\mu g/m^3$	4.7	80
4	Nitrogen Dioxide (NO_2)	IS:5182: Part 06:2006	$\mu g/m^3$	9.1	80
5	Carbon Monoxide (CO)	SARL/IOP/013 (Issue No:01, Issue Date – 01.03.2023)	mg/m^3	BDL (D.L – 1.1)	02

Remarks: Limits: *National Ambient air quality standards from CPCB. BDL- Below detectable limit. DL –Detectable limit.

For Shrient Analytical and Research Labs Pvt. Ltd

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Authorized Signatory

J. GNANASEKARASAM
Technical Manager

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TEST REPORT

Report No.	SARL/23-070	Report Date.	18.11.2023

Customer Name & Address	Project Name: Thiru R. Natarajan - TOR File No 9971 The proposed quarry of Thiru.R.Natarajan survey nos. 253/7, 259/5, 259/2 and 259/4 over an extent of 2.31.50 Ha, Karadikudi Village, Anaicut Taluk, Vellore District, Tamil Nadu.
Sample Description	AMBIENT AIR QUALITY
Sampling Procedure	IS – 5182 (Part – 14: 2000 & Part – V: Reaffirmed - 2003), CPCB Guide lines

Sample Location	A5-ODIYATHUR
Positioned height of Sampler	1.5 M above Ground Level

Customer Reference	As per work order	Sampling Procedure	24 hrs
Sample Reference No	SARL/A/CHE-070	Sample Received on	13.11.2023
Sample Collected by	LABORATORY	Test Commenced on	13.11.2023
Sample Collected Date	11.11.2023	Test Completed on	18.11.2023
Temperature	29°C	Relative Humidity	64%
Sample Condition	Fit for Analysis		

S. No.	Parameters	Protocol	Unit	Results	*Limits
1	Particulate Matter less than 10 micron size (PM_{10})	IS:5182: Part 23:2006	$\mu g/m^3$	53.7	100
2	Particulate Matter less than 2.5 micron size ($PM_{2.5}$)	IS 5182 (Part 24):2019	$\mu g/m^3$	24.7	60
3	Sulphur Dioxide (SO_2)	IS:5182: Part 02:2001	$\mu g/m^3$	4.7	80
4	Nitrogen Dioxide (NO_2)	IS:5182: Part 06:2006	$\mu g/m^3$	8.3	80
5	Carbon Monoxide (CO)	SARL/IOP/013 (Issue No:01, Issue Date – 01.03.2023)	mg/m^3	BDL (D.L – 1.1)	02

Remarks: Limits: *National Ambient air quality standards from CPCB. BDL- Below detectable limit. DL –Detectable limit.

For Shrient Analytical and Research Labs Pvt. Ltd

Verified 18/11/23

Authorized Signatory

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J. GNANAPRAKASAM
Technical Manager

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TEST REPORT

Report No.	SARL/23-071	Report Date.	18.11.2023

Customer Name & Address	Project Name: Thiru R. Natarajan - TOR File No 9971 The proposed quarry of Thiru.R.Natarajan survey nos. 253/7, 259/5, 259/2 and 259/4 over an extent of 2.31.50 Ha, Karadikudi Village, Anaicut Taluk, Vellore District, Tamil Nadu.
Sample Description	AMBIENT AIR QUALITY
Sampling Procedure	IS – 5182 (Part – 14: 2000 & Part – V: Reaffirmed - 2003), CPCB Guide lines

Sample Location	A6-ANAICUT
Positioned height of Sampler	1.5 M above Ground Level

Customer Reference	As per work order	Sampling Procedure	24 hrs
Sample Reference No	SARL/A/CHE-071	Sample Received on	13.11.2023
Sample Collected by	LABORATORY	Test Commenced on	13.11.2023
Sample Collected Date	11.11.2023	Test Completed on	18.11.2023
Temperature	29°C	Relative Humidity	64%
Sample Condition	Fit for Analysis		

S. No.	Parameters	Protocol	Unit	Results	*Limits
1	Particulate Matter less than 10 micron size (PM_{10})	IS:5182: Part 23:2006	$\mu g/m^3$	52.3	100
2	Particulate Matter less than 2.5 micron size ($PM_{2.5}$)	IS 5182 (Part 24):2019	$\mu g/m^3$	23.5	60
3	Sulphur Dioxide (SO_2)	IS:5182: Part 02:2001	$\mu g/m^3$	4.3	80
4	Nitrogen Dioxide (NO_2)	IS:5182: Part 06:2006	$\mu g/m^3$	7.1	80
5	Carbon Monoxide (CO)	SARL/IOP/013 (Issue No:01, Issue Date – 01.03.2023)	mg/m^3	BDL (D.L – 1.1)	02

Remarks: Limits: *National Ambient air quality standards from CPCB. BDL- Below detectable limit. DL –Detectable limit.

For Shrient Analytical and Research Labs Pvt. Ltd

Verified 18/11/23

Authorized Signatory

J. GNANAPRAKASAM
Technical Manager

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TEST REPORT

Report No.	SARL/23-072	Report Date.	18.11.2023

Customer Name & Address	Project Name: Thiru R. Natarajan - TOR File No 9971 The proposed quarry of Thiru.R.Natarajan survey nos. 253/7, 259/5, 259/2 and 259/4 over an extent of 2.31.50 Ha, Karadikudi Village, Anaicut Taluk, Vellore District, Tamil Nadu.
Sample Description	AMBIENT AIR QUALITY
Sampling Procedure	IS – 5182 (Part – 14: 2000 & Part – V: Reaffirmed - 2003), CPCB Guide lines

Sample Location	A5-ODIYATHUR
Positioned height of Sampler	1.5 M above Ground Level

Customer Reference	As per work order	Sampling Procedure	24 hrs
Sample Reference No	SARL/A/CHE-072	Sample Received on	13.11.2023
Sample Collected by	LABORATORY	Test Commenced on	13.11.2023
Sample Collected Date	12.11.2023	Test Completed on	18.11.2023
Temperature	29°C	Relative Humidity	55%
Sample Condition	Fit for Analysis		

S. No.	Parameters	Protocol	Unit	Results	*Limits
1	Particulate Matter less than 10 micron size (PM_{10})	IS:5182: Part 23:2006	$\mu g/m^3$	49.4	100
2	Particulate Matter less than 2.5 micron size ($PM_{2.5}$)	IS 5182 (Part 24):2019	$\mu g/m^3$	22.8	60
3	Sulphur Dioxide (SO_2)	IS:5182: Part 02:2001	$\mu g/m^3$	5.8	80
4	Nitrogen Dioxide (NO_2)	IS:5182: Part 06:2006	$\mu g/m^3$	9.2	80
5	Carbon Monoxide (CO)	SARL/IOP/013 (Issue No:01, Issue Date – 01.03.2023)	mg/m^3	BDL (D.L – 1.1)	02

Remarks: Limits: *National Ambient air quality standards from CPCB. BDL- Below detectable limit. DL –Detectable limit.

For Shrient Analytical and Research Labs Pvt. Ltd

Verified 18/11/23

Authorized Signatory
J. GNANAPRAKASAM
Technical Manager

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TEST REPORT

Report No.	SARL/23-073

Report Date.	18.11.2023

Customer Name & Address	Project Name: Thiru R. Natarajan - TOR File No 9971 The proposed quarry of Thiru.R.Natarajan survey nos. 253/7, 259/5, 259/2 and 259/4 over an extent of 2.31.50 Ha, Karadikudi Village, Anaicut Taluk, Vellore District, Tamil Nadu.
Sample Description	AMBIENT AIR QUALITY
Sampling Procedure	IS – 5182 (Part – 14: 2000 & Part – V: Reaffirmed - 2003), CPCB Guide lines

Sample Location	A6-ANAICUT
Positioned height of Sampler	1.5 M above Ground Level

Customer Reference	As per work order	Sampling Procedure	24 hrs
Sample Reference No	SARL/A/CHE-073	Sample Received on	13.11.2023
Sample Collected by	LABORATORY	Test Commenced on	13.11.2023
Sample Collected Date	12.11.2023	Test Completed on	18.11.2023
Temperature	29°C	Relative Humidity	55%
Sample Condition	Fit for Analysis		

S. No.	Parameters	Protocol	Unit	Results	*Limits
1	Particulate Matter less than 10 micron size (PM_{10})	IS:5182: Part 23:2006	$\mu g/m^3$	46.6	100
2	Particulate Matter less than 2.5 micron size ($PM_{2.5}$)	IS 5182 (Part 24):2019	$\mu g/m^3$	20.9	60
3	Sulphur Dioxide (SO_2)	IS:5182: Part 02:2001	$\mu g/m^3$	4.5	80
4	Nitrogen Dioxide (NO_2)	IS:5182: Part 06:2006	$\mu g/m^3$	6.4	80
5	Carbon Monoxide (CO)	SARL/IOP/013 (Issue No:01, Issue Date – 01.03.2023)	mg/m^3	BDL (D.L – 1.1)	02

Remarks: Limits: *National Ambient air quality standards from CPCB. BDL- Below detectable limit. DL –Detectable limit.

For Shrient Analytical and Research Labs Pvt. Ltd

Verified 18/11/23

Authorized Signatory
J. GNANAPRAKASAM
Technical Manager

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TEST REPORT

Report No.	SARL/23-074	Report Date.	26.11.2023

Customer Name & Address	Project Name: Thiru R. Natarajan - TOR File No 9971 The proposed quarry of Thiru.R.Natarajan survey nos. 253/7, 259/5, 259/2 and 259/4 over an extent of 2.31.50 Ha, Karadikudi Village, Anaicut Taluk, Vellore District, Tamil Nadu.
Sample Description	AMBIENT AIR QUALITY
Sampling Procedure	IS – 5182 (Part – 14: 2000 & Part – V: Reaffirmed - 2003), CPCB Guide lines

Sample Location	A5-ODIYATHUR
Positioned height of Sampler	1.5 M above Ground Level

Customer Reference	As per work order	Sampling Procedure	24 hrs
Sample Reference No	SARL/A/CHE-074	Sample Received on	20.11.2023
Sample Collected by	LABORATORY	Test Commenced on	20.11.2023
Sample Collected Date	14.11.2023	Test Completed on	26.11.2023
Temperature	25°C	Relative Humidity	79%
Sample Condition	Fit for Analysis		

S. No.	Parameters	Protocol	Unit	Results	*Limits
1	Particulate Matter less than 10 micron size (PM_{10})	IS:5182: Part 23:2006	$\mu g/m^3$	51.2	100
2	Particulate Matter less than 2.5 micron size ($PM_{2.5}$)	IS 5182 (Part 24):2019	$\mu g/m^3$	23.6	60
3	Sulphur Dioxide (SO_2)	IS:5182: Part 02:2001	$\mu g/m^3$	4.9	80
4	Nitrogen Dioxide (NO_2)	IS:5182: Part 06:2006	$\mu g/m^3$	8.9	80
5	Carbon Monoxide (CO)	SARL/IOP/013 (Issue No:01, Issue Date – 01.03.2023)	mg/m^3	BDL (D.L – 1.1)	02

Remarks: Limits: *National Ambient air quality standards from CPCB. BDL- Below detectable limit. DL –Detectable limit.

For Shrient Analytical and Research Labs Pvt. Ltd

Verified 26/11/23

Authorized Signatory
J. GNANAPRAKASAM
Technical Manager

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Website : www.shrientanalytical.com

TEST REPORT

Report No.	SARL/23-075	Report Date.	26.11.2023

Customer Name & Address	Project Name: Thiru R. Natarajan - TOR File No 9971 The proposed quarry of Thiru.R.Natarajan survey nos. 253/7, 259/5, 259/2 and 259/4 over an extent of 2.31.50 Ha, Karadikudi Village, Anaicut Taluk, Vellore District, Tamil Nadu.
Sample Description	AMBIENT AIR QUALITY
Sampling Procedure	IS – 5182 (Part – 14: 2000 & Part – V: Reaffirmed - 2003), CPCB Guide lines

Sample Location	A6-ANAICUT
Positioned height of Sampler	1.5 M above Ground Level

Customer Reference	As per work order	Sampling Procedure	24 hrs
Sample Reference No	SARL/A/CHE-075	Sample Received on	20.11.2023
Sample Collected by	LABORATORY	Test Commenced on	20.11.2023
Sample Collected Date	14.11.2023	Test Completed on	26.11.2023
Temperature	25°C	Relative Humidity	79%
Sample Condition	Fit for Analysis		

S. No.	Parameters	Protocol	Unit	Results	*Limits
1	Particulate Matter less than 10 micron size (PM_{10})	IS:5182: Part 23:2006	$\mu g/m^3$	51.5	100
2	Particulate Matter less than 2.5 micron size ($PM_{2.5}$)	IS 5182 (Part 24):2019	$\mu g/m^3$	23.2	60
3	Sulphur Dioxide (SO_2)	IS:5182: Part 02:2001	$\mu g/m^3$	5.5	80
4	Nitrogen Dioxide (NO_2)	IS:5182: Part 06:2006	$\mu g/m^3$	6.7	80
5	Carbon Monoxide (CO)	SARL/IOP/013 (Issue No:01, Issue Date – 01.03.2023)	mg/m^3	BDL (D.L – 1.1)	02

Remarks: Limits: *National Ambient air quality standards from CPCB. BDL- Below detectable limit. DL –Detectable limit.

For Shrient Analytical and Research Labs Pvt. Ltd

Verified 26/11/23

Authorized Signatory 26/11/23

J. GNANAPRAKASAM
Technical Manager

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TEST REPORT

Report No.	SARL/23-076	Report Date.	26.11.2023

Customer Name & Address	Project Name: Thiru R. Natarajan - TOR File No 9971 The proposed quarry of Thiru.R.Natarajan survey nos. 253/7, 259/5, 259/2 and 259/4 over an extent of 2.31.50 Ha, Karadikudi Village, Anaicut Taluk, Vellore District, Tamil Nadu.
Sample Description	AMBIENT AIR QUALITY
Sampling Procedure	IS – 5182 (Part – 14: 2000 & Part – V: Reaffirmed - 2003), CPCB Guide lines

Sample Location	A5-ODIYATHUR
Positioned height of Sampler	1.5 M above Ground Level

Customer Reference	As per work order	Sampling Procedure	24 hrs
Sample Reference No	SARL/A/CHE-076	Sample Received on	20.11.2023
Sample Collected by	LABORATORY	Test Commenced on	20.11.2023
Sample Collected Date	15.11.2023	Test Completed on	26.11.2023
Temperature	29°C	Relative Humidity	60%
Sample Condition	Fit for Analysis		

S. No.	Parameters	Protocol	Unit	Results	*Limits
1	Particulate Matter less than 10 micron size (PM_{10})	IS:5182: Part 23:2006	$\mu g/m^3$	49.4	100
2	Particulate Matter less than 2.5 micron size ($PM_{2.5}$)	IS 5182 (Part 24):2019	$\mu g/m^3$	22.7	60
3	Sulphur Dioxide (SO_2)	IS:5182: Part 02:2001	$\mu g/m^3$	5.6	80
4	Nitrogen Dioxide (NO_2)	IS:5182: Part 06:2006	$\mu g/m^3$	8.2	80
5	Carbon Monoxide (CO)	SARL/IOP/013 (Issue No:01, Issue Date – 01.03.2023)	mg/m^3	BDL (D.L – 1.1)	02

Remarks: Limits: *National Ambient air quality standards from CPCB. BDL- Below detectable limit. DL –Detectable limit.

For Shrient Analytical and Research Labs Pvt. Ltd

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J. GNANAPRAKASAM
Technical Manager

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TEST REPORT

Report No.	SARL/23-077	Report Date.	26.11.2023

Customer Name & Address	Project Name: Thiru R. Natarajan - TOR File No 9971 The proposed quarry of Thiru.R.Natarajan survey nos. 253/7, 259/5, 259/2 and 259/4 over an extent of 2.31.50 Ha, Karadikudi Village, Anaicut Taluk, Vellore District, Tamil Nadu.
Sample Description	AMBIENT AIR QUALITY
Sampling Procedure	IS – 5182 (Part – 14: 2000 & Part – V: Reaffirmed - 2003), CPCB Guide lines

Sample Location	A6-ANAICUT
Positioned height of Sampler	1.5 M above Ground Level

Customer Reference	As per work order	Sampling Procedure	24 hrs
Sample Reference No	SARL/A/CHE-077	Sample Received on	20.11.2023
Sample Collected by	LABORATORY	Test Commenced on	20.11.2023
Sample Collected Date	15.11.2023	Test Completed on	26.11.2023
Temperature	29°C	Relative Humidity	60%
Sample Condition	Fit for Analysis		

S. No.	Parameters	Protocol	Unit	Results	*Limits
1	Particulate Matter less than 10 micron size (PM_{10})	IS:5182: Part 23:2006	$\mu g/m^3$	55.1	100
2	Particulate Matter less than 2.5 micron size ($PM_{2.5}$)	IS 5182 (Part 24):2019	$\mu g/m^3$	24.8	60
3	Sulphur Dioxide (SO_2)	IS:5182: Part 02:2001	$\mu g/m^3$	4.5	80
4	Nitrogen Dioxide (NO_2)	IS:5182: Part 06:2006	$\mu g/m^3$	7.1	80
5	Carbon Monoxide (CO)	SARL/IOP/013 (Issue No:01, Issue Date – 01.03.2023)	mg/m^3	BDL (D.L – 1.1)	02

Remarks: Limits: *National Ambient air quality standards from CPCB. BDL- Below detectable limit. DL –Detectable limit.

For Shrient Analytical and Research Labs Pvt. Ltd

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J. GNANAPRAKASAM
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TEST REPORT

Report No.	SARL/23-078

Report Date.	26.11.2023

Customer Name & Address	Project Name: Thiru R. Natarajan - TOR File No 9971 The proposed quarry of Thiru.R.Natarajan survey nos. 253/7, 259/5, 259/2 and 259/4 over an extent of 2.31.50 Ha, Karadikudi Village, Anaicut Taluk, Vellore District, Tamil Nadu.
Sample Description	AMBIENT AIR QUALITY
Sampling Procedure	IS – 5182 (Part – 14: 2000 & Part – V: Reaffirmed - 2003), CPCB Guide lines

Sample Location	A3-PICHANATHAM
Positioned height of Sampler	1.5 M above Ground Level

Customer Reference	As per work order	Sampling Procedure	24 hrs
Sample Reference No	SARL/A/CHE-078	Sample Received on	20.11.2023
Sample Collected by	LABORATORY	Test Commenced on	20.11.2023
Sample Collected Date	16.11.2023	Test Completed on	26.11.2023
Temperature	32°C	Relative Humidity	51%
Sample Condition	Fit for Analysis		

S. No.	Parameters	Protocol	Unit	Results	*Limits
1	Particulate Matter less than 10 micron size (PM_{10})	IS:5182: Part 23:2006	$\mu g/m^3$	50.1	100
2	Particulate Matter less than 2.5 micron size ($PM_{2.5}$)	IS 5182 (Part 24):2019	$\mu g/m^3$	25.7	60
3	Sulphur Dioxide (SO_2)	IS:5182: Part 02:2001	$\mu g/m^3$	4.6	80
4	Nitrogen Dioxide (NO_2)	IS:5182: Part 06:2006	$\mu g/m^3$	6.2	80
5	Carbon Monoxide (CO)	SARL/IOP/013 (Issue No:01, Issue Date – 01.03.2023)	mg/m^3	BDL (D.L – 1.1)	02

Remarks: Limits: *National Ambient air quality standards from CPCB. BDL- Below detectable limit. DL –Detectable limit.

For Shrient Analytical and Research Labs Pvt. Ltd

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TEST REPORT

Report No.	SARL/23-079	Report Date.	26.11.2023

Customer Name & Address	Project Name: Thiru R. Natarajan - TOR File No 9971 The proposed quarry of Thiru.R.Natarajan survey nos. 253/7, 259/5, 259/2 and 259/4 over an extent of 2.31.50 Ha, Karadikudi Village, Anaicut Taluk, Vellore District, Tamil Nadu.
Sample Description	AMBIENT AIR QUALITY
Sampling Procedure	IS – 5182 (Part – 14: 2000 & Part – V: Reaffirmed - 2003), CPCB Guide lines

Sample Location	A4-KARADIKUDI
Positioned height of Sampler	1.5 M above Ground Level

Customer Reference	As per work order	Sampling Procedure	24 hrs
Sample Reference No	SARL/A/CHE-079	Sample Received on	20.11.2023
Sample Collected by	LABORATORY	Test Commenced on	20.11.2023
Sample Collected Date	16.11.2023	Test Completed on	26.11.2023
Temperature	32°C	Relative Humidity	51%
Sample Condition	Fit for Analysis		

S. No.	Parameters	Protocol	Unit	Results	*Limits
1	Particulate Matter less than 10 micron size (PM_{10})	IS:5182: Part 23:2006	$\mu g/m^3$	47.3	100
2	Particulate Matter less than 2.5 micron size ($PM_{2.5}$)	IS 5182 (Part 24):2019	$\mu g/m^3$	23.7	60
3	Sulphur Dioxide (SO_2)	IS:5182: Part 02:2001	$\mu g/m^3$	4.2	80
4	Nitrogen Dioxide (NO_2)	IS:5182: Part 06:2006	$\mu g/m^3$	8.9	80
5	Carbon Monoxide (CO)	SARL/IOP/013 (Issue No:01, Issue Date – 01.03.2023)	mg/m^3	BDL (D.L – 1.1)	02

Remarks: Limits: *National Ambient air quality standards from CPCB. BDL- Below detectable limit. DL –Detectable limit.

For Shrient Analytical and Research Labs Pvt. Ltd

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TEST REPORT

Report No.	SARL/23-080	Report Date.	26.11.2023

Customer Name & Address	Project Name: Thiru R. Natarajan - TOR File No 9971 The proposed quarry of Thiru.R.Natarajan survey nos. 253/7, 259/5, 259/2 and 259/4 over an extent of 2.31.50 Ha, Karadikudi Village, Anaicut Taluk, Vellore District, Tamil Nadu.
Sample Description	AMBIENT AIR QUALITY
Sampling Procedure	IS – 5182 (Part – 14: 2000 & Part – V: Reaffirmed - 2003), CPCB Guide lines

Sample Location	A3-PICHANATHAM
Positioned height of Sampler	1.5 M above Ground Level

Customer Reference	As per work order	Sampling Procedure	24 hrs
Sample Reference No	SARL/A/CHE-080	Sample Received on	20.11.2023
Sample Collected by	LABORATORY	Test Commenced on	20.11.2023
Sample Collected Date	17.11.2023	Test Completed on	26.11.2023
Temperature	31°C	Relative Humidity	57%
Sample Condition	Fit for Analysis		

S. No.	Parameters	Protocol	Unit	Results	*Limits
1	Particulate Matter less than 10 micron size (PM_{10})	IS:5182: Part 23:2006	$\mu g/m^3$	47.6	100
2	Particulate Matter less than 2.5 micron size ($PM_{2.5}$)	IS 5182 (Part 24):2019	$\mu g/m^3$	24.1	60
3	Sulphur Dioxide (SO_2)	IS:5182: Part 02:2001	$\mu g/m^3$	4.3	80
4	Nitrogen Dioxide (NO_2)	IS:5182: Part 06:2006	$\mu g/m^3$	8.4	80
5	Carbon Monoxide (CO)	SARL/IOP/013 (Issue No:01, Issue Date – 01.03.2023)	mg/m^3	BDL (D.L – 1.1)	02

Remarks: Limits: *National Ambient air quality standards from CPCB. BDL- Below detectable limit. DL –Detectable limit.

For Shrient Analytical and Research Labs Pvt. Ltd

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TEST REPORT

Report No.	SARL/23-081	Report Date.	26.11.2023

Customer Name & Address	Project Name: Thiru R. Natarajan - TOR File No 9971 The proposed quarry of Thiru.R.Natarajan survey nos. 253/7, 259/5, 259/2 and 259/4 over an extent of 2.31.50 Ha, Karadikudi Village, Anaicut Taluk, Vellore District, Tamil Nadu.
Sample Description	AMBIENT AIR QUALITY
Sampling Procedure	IS – 5182 (Part – 14: 2000 & Part – V: Reaffirmed - 2003), CPCB Guide lines

Sample Location	A4-KARADIKUDI
Positioned height of Sampler	1.5 M above Ground Level

Customer Reference	As per work order	Sampling Procedure	24 hrs
Sample Reference No	SARL/A/CHE-081	Sample Received on	20.11.2023
Sample Collected by	LABORATORY	Test Commenced on	20.11.2023
Sample Collected Date	17.11.2023	Test Completed on	26.11.2023
Temperature	31°C	Relative Humidity	57%
Sample Condition	Fit for Analysis		

S. No.	Parameters	Protocol	Unit	Results	*Limits
1	Particulate Matter less than 10 micron size (PM_{10})	IS:5182: Part 23:2006	$\mu g/m^3$	46.5	100
2	Particulate Matter less than 2.5 micron size ($PM_{2.5}$)	IS 5182 (Part 24):2019	$\mu g/m^3$	22.1	60
3	Sulphur Dioxide (SO_2)	IS:5182: Part 02:2001	$\mu g/m^3$	4.8	80
4	Nitrogen Dioxide (NO_2)	IS:5182: Part 06:2006	$\mu g/m^3$	8.2	80
5	Carbon Monoxide (CO)	SARL/IOP/013 (Issue No:01, Issue Date – 01.03.2023)	mg/m^3	BDL (D.L – 1.1)	02

Remarks: Limits: *National Ambient air quality standards from CPCB. BDL- Below detectable limit. DL –Detectable limit.

For Shrient Analytical and Research Labs Pvt. Ltd

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TEST REPORT

Report No.	SARL/23-082	Report Date.	26.11.2023

Customer Name & Address	Project Name: Thiru R. Natarajan - TOR File No 9971 The proposed quarry of Thiru.R.Natarajan survey nos. 253/7, 259/5, 259/2 and 259/4 over an extent of 2.31.50 Ha, Karadikudi Village, Anaicut Taluk, Vellore District, Tamil Nadu.
Sample Description	AMBIENT AIR QUALITY
Sampling Procedure	IS – 5182 (Part – 14: 2000 & Part – V: Reaffirmed - 2003), CPCB Guide lines

Sample Location	A1-WITHIN MINE LEASE AREA
Positioned height of Sampler	1.5 M above Ground Level

Customer Reference	As per work order	Sampling Procedure	24 hrs
Sample Reference No	SARL/A/CHE-082	Sample Received on	20.11.2023
Sample Collected by	LABORATORY	Test Commenced on	20.11.2023
Sample Collected Date	18.11.2023	Test Completed on	26.11.2023
Temperature	30°C	Relative Humidity	61%
Sample Condition	Fit for Analysis		

S. No.	Parameters	Protocol	Unit	Results	*Limits
1	Particulate Matter less than 10 micron size (PM_{10})	IS:5182: Part 23:2006	$\mu g/m^3$	60.8	100
2	Particulate Matter less than 2.5 micron size ($PM_{2.5}$)	IS 5182 (Part 24):2019	$\mu g/m^3$	29.1	60
3	Sulphur Dioxide (SO_2)	IS:5182: Part 02:2001	$\mu g/m^3$	5.8	80
4	Nitrogen Dioxide (NO_2)	IS:5182: Part 06:2006	$\mu g/m^3$	9.1	80
5	Carbon Monoxide (CO)	SARL/IOP/013 (Issue No:01, Issue Date – 01.03.2023)	mg/m^3	BDL (D.L – 1.1)	02

Remarks: Limits: *National Ambient air quality standards from CPCB. BDL- Below detectable limit. DL –Detectable limit.

For Shrient Analytical and Research Labs Pvt. Ltd

26/11/23

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26/11/23

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TEST REPORT

Report No.	SARL/23-083

Report Date.	26.11.2023

Customer Name & Address	Project Name: Thiru R. Natarajan - TOR File No 9971 The proposed quarry of Thiru.R.Natarajan survey nos. 253/7, 259/5, 259/2 and 259/4 over an extent of 2.31.50 Ha, Karadikudi Village, Anaicut Taluk, Vellore District, Tamil Nadu.
Sample Description	AMBIENT AIR QUALITY
Sampling Procedure	IS – 5182 (Part – 14: 2000 & Part – V: Reaffirmed - 2003), CPCB Guide lines

Sample Location	A2-THANGAL
Positioned height of Sampler	1.5 M above Ground Level

Customer Reference	As per work order	Sampling Procedure	24 hrs
Sample Reference No	SARL/A/CHE-083	Sample Received on	20.11.2023
Sample Collected by	LABORATORY	Test Commenced on	20.11.2023
Sample Collected Date	18.11.2023	Test Completed on	26.11.2023
Temperature	30°C	Relative Humidity	61%
Sample Condition	Fit for Analysis		

S. No.	Parameters	Protocol	Unit	Results	*Limits
1	Particulate Matter less than 10 micron size (PM_{10})	IS:5182: Part 23:2006	$\mu g/m^3$	48.6	100
2	Particulate Matter less than 2.5 micron size ($PM_{2.5}$)	IS 5182 (Part 24):2019	$\mu g/m^3$	22.1	60
3	Sulphur Dioxide (SO_2)	IS:5182: Part 02:2001	$\mu g/m^3$	5.2	80
4	Nitrogen Dioxide (NO_2)	IS:5182: Part 06:2006	$\mu g/m^3$	7.7	80
5	Carbon Monoxide (CO)	SARL/IOP/013 (Issue No:01, Issue Date – 01.03.2023)	mg/m^3	BDL (D.L – 1.1)	02

Remarks: Limits: *National Ambient air quality standards from CPCB. BDL- Below detectable limit. DL –Detectable limit.

For Shrient Analytical and Research Labs Pvt. Ltd

Verified 26/11/23

Authorized Signatory

J. GNANAPRAKASAM
Technical Manager

END OF THE REPORT

Please Contact:
For any Technical Issues & Complaints: vimalnath@shrientanalytical.com

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Phone No: 9841074398 / 9698141777 E-mail : Info@shrientanalytical.com
Website : www.shrientanalytical.com

TEST REPORT

Report No.	SARL/23-084	Report Date.	26.11.2023

Customer Name & Address	Project Name: Thiru R. Natarajan - TOR File No 9971 The proposed quarry of Thiru.R.Natarajan survey nos. 253/7, 259/5, 259/2 and 259/4 over an extent of 2.31.50 Ha, Karadikudi Village, Anaicut Taluk, Vellore District, Tamil Nadu.
Sample Description	AMBIENT AIR QUALITY
Sampling Procedure	IS – 5182 (Part – 14: 2000 & Part – V: Reaffirmed - 2003), CPCB Guide lines

Sample Location	A1-WITHIN MINE LEASE AREA
Positioned height of Sampler	1.5 M above Ground Level

Customer Reference	As per work order	Sampling Procedure	24 hrs
Sample Reference No	SARL/A/CHE-084	Sample Received on	20.11.2023
Sample Collected by	LABORATORY	Test Commenced on	20.11.2023
Sample Collected Date	19.11.2023	Test Completed on	26.11.2023
Temperature	27°C	Relative Humidity	80%
Sample Condition	Fit for Analysis		

S. No.	Parameters	Protocol	Unit	Results	*Limits
1	Particulate Matter less than 10 micron size (PM_{10})	IS:5182: Part 23:2006	$\mu g/m^3$	64.3	100
2	Particulate Matter less than 2.5 micron size ($PM_{2.5}$)	IS 5182 (Part 24):2019	$\mu g/m^3$	27.7	60
3	Sulphur Dioxide (SO_2)	IS:5182: Part 02:2001	$\mu g/m^3$	4.8	80
4	Nitrogen Dioxide (NO_2)	IS:5182: Part 06:2006	$\mu g/m^3$	9.5	80
5	Carbon Monoxide (CO)	SARL/IOP/013 (Issue No:01, Issue Date – 01.03.2023)	mg/m^3	BDL (D.L – 1.1)	02

Remarks: Limits: *National Ambient air quality standards from CPCB. BDL- Below detectable limit. DL –Detectable limit.

For Shrient Analytical and Research Labs Pvt. Ltd

Verified 26/11/23

Authorized Signatory
J. GNANAPRAKASAM
Technical Manager

END OF THE REPORT

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Website : www.shrientanalytical.com

TEST REPORT

Report No.	SARL/23-085	Report Date.	26.11.2023

Customer Name & Address	Project Name: Thiru R. Natarajan - TOR File No 9971 The proposed quarry of Thiru.R.Natarajan survey nos. 253/7, 259/5, 259/2 and 259/4 over an extent of 2.31.50 Ha, Karadikudi Village, Anaicut Taluk, Vellore District, Tamil Nadu.
Sample Description	AMBIENT AIR QUALITY
Sampling Procedure	IS – 5182 (Part – 14: 2000 & Part – V: Reaffirmed - 2003), CPCB Guide lines

Sample Location	A2-THANGAL
Positioned height of Sampler	1.5 M above Ground Level

Customer Reference	As per work order	Sampling Procedure	24 hrs
Sample Reference No	SARL/A/CHE-085	Sample Received on	20.11.2023
Sample Collected by	LABORATORY	Test Commenced on	20.11.2023
Sample Collected Date	19.11.2023	Test Completed on	26.11.2023
Temperature	27°C	Relative Humidity	80%
Sample Condition	Fit for Analysis		

S. No.	Parameters	Protocol	Unit	Results	*Limits
1	Particulate Matter less than 10 micron size (PM_{10})	IS:5182: Part 23:2006	$\mu g/m^3$	51.6	100
2	Particulate Matter less than 2.5 micron size ($PM_{2.5}$)	IS 5182 (Part 24):2019	$\mu g/m^3$	23.6	60
3	Sulphur Dioxide (SO_2)	IS:5182: Part 02:2001	$\mu g/m^3$	5.6	80
4	Nitrogen Dioxide (NO_2)	IS:5182: Part 06:2006	$\mu g/m^3$	7.3	80
5	Carbon Monoxide (CO)	SARL/IOP/013 (Issue No:01, Issue Date – 01.03.2023)	mg/m^3	BDL (D.L – 1.1)	02

Remarks: Limits: *National Ambient air quality standards from CPCB. BDL- Below detectable limit. DL –Detectable limit.

For Shrient Analytical and Research Labs Pvt. Ltd

Verified 26/11/23

Authorized Signatory

J. GNANAPRAKASAM
Technical Manager

END OF THE REPORT

Please Contact:
For any Technical Issues & Complaints: vimalnath@shrientanalytical.com

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Website : www.shrientanalytical.com

TEST REPORT

Report No.	SARL/23-086	Report Date.	02.12.2023

Customer Name & Address	Project Name: Thiru R. Natarajan - TOR File No 9971 The proposed quarry of Thiru.R.Natarajan survey nos. 253/7, 259/5, 259/2 and 259/4 over an extent of 2.31.50 Ha, Karadikudi Village, Anaicut Taluk, Vellore District, Tamil Nadu.
Sample Description	AMBIENT AIR QUALITY
Sampling Procedure	IS – 5182 (Part – 14: 2000 & Part – V: Reaffirmed - 2003), CPCB Guide lines

Sample Location	A1-WITHIN MINE LEASE AREA
Positioned height of Sampler	1.5 M above Ground Level

Customer Reference	As per work order	Sampling Procedure	24 hrs
Sample Reference No	SARL/A/CHE-086	Sample Received on	27.11.2023
Sample Collected by	LABORATORY	Test Commenced on	27.11.2023
Sample Collected Date	21.11.2023	Test Completed on	02.12.2023
Temperature	32°C	Relative Humidity	54%
Sample Condition	Fit for Analysis		

S. No.	Parameters	Protocol	Unit	Results	*Limits
1	Particulate Matter less than 10 micron size (PM_{10})	IS:5182: Part 23:2006	$\mu g/m^3$	55.5	100
2	Particulate Matter less than 2.5 micron size ($PM_{2.5}$)	IS 5182 (Part 24):2019	$\mu g/m^3$	26.1	60
3	Sulphur Dioxide (SO_2)	IS:5182: Part 02:2001	$\mu g/m^3$	4.4	80
4	Nitrogen Dioxide (NO_2)	IS:5182: Part 06:2006	$\mu g/m^3$	9.6	80
5	Carbon Monoxide (CO)	SARL/IOP/013 (Issue No:01, Issue Date – 01.03.2023)	mg/m^3	BDL (D.L – 1.1)	02

Remarks: Limits: *National Ambient air quality standards from CPCB. BDL- Below detectable limit. DL –Detectable limit.

For Shrient Analytical and Research Labs Pvt. Ltd

Verified 02/12/23

02/12/23

Authorized Signatory
J. GNANAPRAKASAM
Technical Manager

END OF THE REPORT

Please Contact:
For any Technical Issues & Complaints: vimalnath@shrientanalytical.com

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TEST REPORT

Report No.	SARL/23-087	Report Date.	02.12.2023

Customer Name & Address	Project Name: Thiru R. Natarajan - TOR File No 9971 The proposed quarry of Thiru.R.Natarajan survey nos. 253/7, 259/5, 259/2 and 259/4 over an extent of 2.31.50 Ha, Karadikudi Village, Anaicut Taluk, Vellore District, Tamil Nadu.
Sample Description	AMBIENT AIR QUALITY
Sampling Procedure	IS – 5182 (Part – 14: 2000 & Part – V: Reaffirmed - 2003), CPCB Guide lines

Sample Location	A2-THANGAL
Positioned height of Sampler	1.5 M above Ground Level

Customer Reference	As per work order	Sampling Procedure	24 hrs
Sample Reference No	SARL/A/CHE-087	Sample Received on	27.11.2023
Sample Collected by	LABORATORY	Test Commenced on	27.11.2023
Sample Collected Date	21.11.2023	Test Completed on	02.12.2023
Temperature	32°C	Relative Humidity	54%
Sample Condition	Fit for Analysis		

S. No.	Parameters	Protocol	Unit	Results	*Limits
1	Particulate Matter less than 10 micron size (PM_{10})	IS:5182: Part 23:2006	$\mu g/m^3$	54.1	100
2	Particulate Matter less than 2.5 micron size ($PM_{2.5}$)	IS 5182 (Part 24):2019	$\mu g/m^3$	25.6	60
3	Sulphur Dioxide (SO_2)	IS:5182: Part 02:2001	$\mu g/m^3$	6.4	80
4	Nitrogen Dioxide (NO_2)	IS:5182: Part 06:2006	$\mu g/m^3$	8.7	80
5	Carbon Monoxide (CO)	SARL/IOP/013 (Issue No:01, Issue Date – 01.03.2023)	mg/m^3	BDL (D.L – 1.1)	02

Remarks: Limits: *National Ambient air quality standards from CPCB. BDL- Below detectable limit. DL –Detectable limit.

For Shrient Analytical and Research Labs Pvt. Ltd

Verified 02/12/23

Authorized Signatory

J. GNANAPRAKASAM
Technical Manager

END OF THE REPORT

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TEST REPORT

Report No.	SARL/23-088	Report Date.	02.12.2023

Customer Name & Address	Project Name: Thiru R. Natarajan - TOR File No 9971 The proposed quarry of Thiru.R.Natarajan survey nos. 253/7, 259/5, 259/2 and 259/4 over an extent of 2.31.50 Ha, Karadikudi Village, Anaicut Taluk, Vellore District, Tamil Nadu.
Sample Description	AMBIENT AIR QUALITY
Sampling Procedure	IS – 5182 (Part – 14: 2000 & Part – V: Reaffirmed - 2003), CPCB Guide lines

Sample Location	A1-WITHIN MINE LEASE AREA
Positioned height of Sampler	1.5 M above Ground Level

Customer Reference	As per work order	Sampling Procedure	24 hrs
Sample Reference No	SARL/A/CHE-088	Sample Received on	27.11.2023
Sample Collected by	LABORATORY	Test Commenced on	27.11.2023
Sample Collected Date	22.11.2023	Test Completed on	02.12.2023
Temperature	30°C	Relative Humidity	69%
Sample Condition	Fit for Analysis		

S. No.	Parameters	Protocol	Unit	Results	*Limits
1	Particulate Matter less than 10 micron size (PM_{10})	IS:5182: Part 23:2006	$\mu g/m^3$	62.6	100
2	Particulate Matter less than 2.5 micron size ($PM_{2.5}$)	IS 5182 (Part 24):2019	$\mu g/m^3$	27.6	60
3	Sulphur Dioxide (SO_2)	IS:5182: Part 02:2001	$\mu g/m^3$	5.1	80
4	Nitrogen Dioxide (NO_2)	IS:5182: Part 06:2006	$\mu g/m^3$	9.7	80
5	Carbon Monoxide (CO)	SARL/IOP/013 (Issue No:01, Issue Date – 01.03.2023)	mg/m^3	BDL (D.L – 1.1)	02

Remarks: Limits: *National Ambient air quality standards from CPCB. BDL- Below detectable limit. DL –Detectable limit.

For Shrient Analytical and Research Labs Pvt. Ltd

Verified 02/12/23

Authorized Signatory 02/12/23

J. GNANAPRAKASAM
Technical Manager

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TEST REPORT

Report No.	SARL/23-089	Report Date.	02.12.2023

Customer Name & Address	Project Name: Thiru R. Natarajan - TOR File No 9971 The proposed quarry of Thiru.R.Natarajan survey nos. 253/7, 259/5, 259/2 and 259/4 over an extent of 2.31.50 Ha, Karadikudi Village, Anaicut Taluk, Vellore District, Tamil Nadu.
Sample Description	AMBIENT AIR QUALITY
Sampling Procedure	IS – 5182 (Part – 14: 2000 & Part – V: Reaffirmed - 2003), CPCB Guide lines

Sample Location	A2-THANGAL
Positioned height of Sampler	1.5 M above Ground Level

Customer Reference	As per work order	Sampling Procedure	24 hrs
Sample Reference No	SARL/A/CHE-089	Sample Received on	27.11.2023
Sample Collected by	LABORATORY	Test Commenced on	27.11.2023
Sample Collected Date	22.11.2023	Test Completed on	02.12.2023
Temperature	30°C	Relative Humidity	69%
Sample Condition	Fit for Analysis		

S. No.	Parameters	Protocol	Unit	Results	*Limits
1	Particulate Matter less than 10 micron size (PM_{10})	IS:5182: Part 23:2006	$\mu g/m^3$	51.3	100
2	Particulate Matter less than 2.5 micron size ($PM_{2.5}$)	IS 5182 (Part 24):2019	$\mu g/m^3$	27.1	60
3	Sulphur Dioxide (SO_2)	IS:5182: Part 02:2001	$\mu g/m^3$	5.9	80
4	Nitrogen Dioxide (NO_2)	IS:5182: Part 06:2006	$\mu g/m^3$	8.3	80
5	Carbon Monoxide (CO)	SARL/IOP/013 (Issue No:01, Issue Date – 01.03.2023)	mg/m^3	BDL (D.L – 1.1)	02

Remarks: Limits: *National Ambient air quality standards from CPCB. BDL- Below detectable limit. DL –Detectable limit.

For Shrient Analytical and Research Labs Pvt. Ltd

Verified 02/12/23

Authorized Signatory 02/12/23

J. GNANAPRAKASAM
Technical Manager

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Website : www.shrientanalytical.com

TEST REPORT

Report No.	SARL/23-090	Report Date.	02.12.2023

Customer Name & Address	Project Name: Thiru R. Natarajan - TOR File No 9971 The proposed quarry of Thiru.R.Natarajan survey nos. 253/7, 259/5, 259/2 and 259/4 over an extent of 2.31.50 Ha, Karadikudi Village, Anaicut Taluk, Vellore District, Tamil Nadu.
Sample Description	AMBIENT AIR QUALITY
Sampling Procedure	IS – 5182 (Part – 14: 2000 & Part – V: Reaffirmed - 2003), CPCB Guide lines

Sample Location	A3-PICHANATHAM
Positioned height of Sampler	1.5 M above Ground Level

Customer Reference	As per work order	Sampling Procedure	24 hrs
Sample Reference No	SARL/A/CHE-090	Sample Received on	27.11.2023
Sample Collected by	LABORATORY	Test Commenced on	27.11.2023
Sample Collected Date	23.11.2023	Test Completed on	02.12.2023
Temperature	29°C	Relative Humidity	69%
Sample Condition	Fit for Analysis		

S. No.	Parameters	Protocol	Unit	Results	*Limits
1	Particulate Matter less than 10 micron size (PM_{10})	IS:5182: Part 23:2006	$\mu g/m^3$	46.3	100
2	Particulate Matter less than 2.5 micron size ($PM_{2.5}$)	IS 5182 (Part 24):2019	$\mu g/m^3$	23.1	60
3	Sulphur Dioxide (SO_2)	IS:5182: Part 02:2001	$\mu g/m^3$	5.2	80
4	Nitrogen Dioxide (NO_2)	IS:5182: Part 06:2006	$\mu g/m^3$	7.2	80
5	Carbon Monoxide (CO)	SARL/IOP/013 (Issue No:01, Issue Date – 01.03.2023)	mg/m^3	BDL (D.L – 1.1)	02

Remarks: Limits: *National Ambient air quality standards from CPCB. BDL- Below detectable limit. DL –Detectable limit.

For Shrient Analytical and Research Labs Pvt. Ltd

Verified 02/12/23

Authorized Signatory

J. GNANAPRAKASAM
Technical Manager

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ANNEXURE-9

National Accreditation Board for Testing and Calibration Laboratories

CERTIFICATE OF ACCREDITATION

SHRIENT ANALYTICAL & RESEARCH LABS PRIVATE LIMITED

has been assessed and accredited in accordance with the standard

ISO/IEC 17025:2017

"General Requirements for the Competence of Testing & Calibration Laboratories"

for its facilities at

416/15, DHARGAS ROAD, PERUNGALATHUR, WEST TAMBARAM, CHENNAI, KANCHIPURAM, TAMIL NADU, INDIA

in the field of

TESTING

Certificate Number: TC-12339

Issue Date: 30/09/2023 **Valid Until:** 29/09/2025

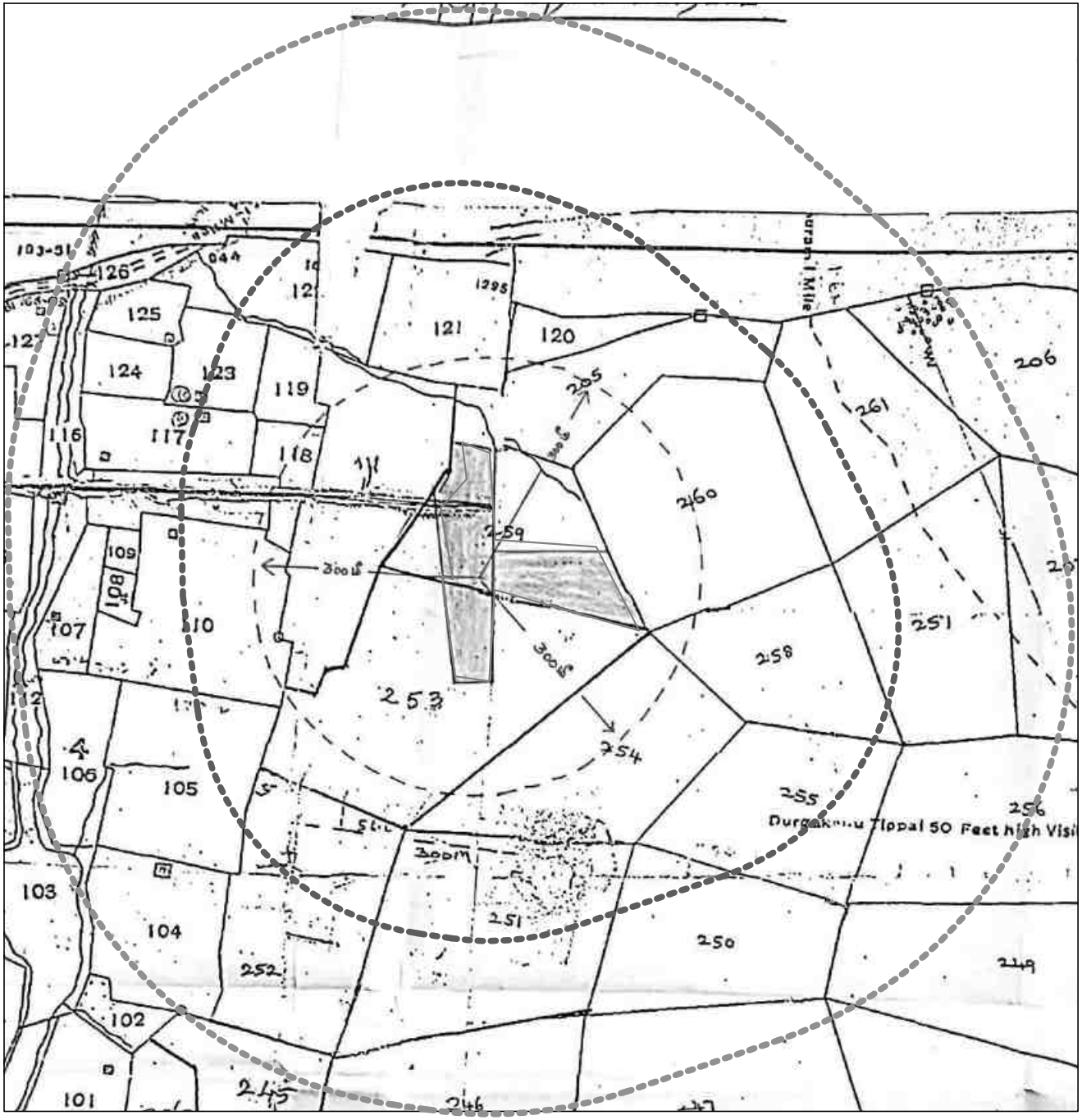
This certificate remains valid for the Scope of Accreditation as specified in the annexure subject to continued satisfactory compliance to the above standard & the relevant requirements of NABL.
(To see the scope of accreditation of this laboratory, you may also visit NABL website www.nabl-india.org)

Name of Legal Entity: SHRIENT ANALYTICAL AND RESEARCH LABS PRIVATE LIMITED

Signed for and on behalf of NABL

N. Venkateswaran
Chief Executive Officer

ANNEXURE-10



APPLICANT:

THIRU.R.NATARAJAN,
S/O.RANGASAMY,
NO.14, AYYAGOUNDARPATTI,
KOLLAMANGALAM VILLAGE,
GUDIYATHAM TALUK,
VELLORE DISTRICT.

QUARRY LEASE APPLIED AREA:

S.F.NO's : 253/7, 259/5, 259/2 & 259/4,
EXTENT : 2.31.50 Ha,
VILLAGE : KARADIKUDI,
TALUK : ANAICUT,
DISTRICT : VELLORE.

INDEX

TOPO SHEET NO : 57L/ 13

LATITUDE:12°50'40.55"Nto12°50'49.50"N

LONGITUDE:78°56'07.22"Eto78°56'14.85"E

Q.L.APPLIED AREA

300M RADIUS

500M RADIUS

VILLAGE MAP

SCALE 1 : 5,000

ANNEXURE-11

PLATE NO-I C

DATE OF SURVEY : 29.12.2023

APPLICANT:

THIRU.R.NATARAJAN,
S/O.RANGASAMY,
NO.14, AYYAGOUNDARPATTI,
KOLLAMANGALAM VILLAGE,
GUDIYATHAM TALUK,
VELLORE DISTRICT.

ASSISTANT DIRECTOR * MINES & GEOLOGY VELLORE

QUARRY LEASE APPLIED AREA:

S.F.NO's : 253/7, 259/5, 259/2 & 259/4,
EXTENT : 2.31.50 Ha,
VILLAGE : KARADIKUDI,
TALUK : ANAICUT,
DISTRICT : VELLORE.

INDEX

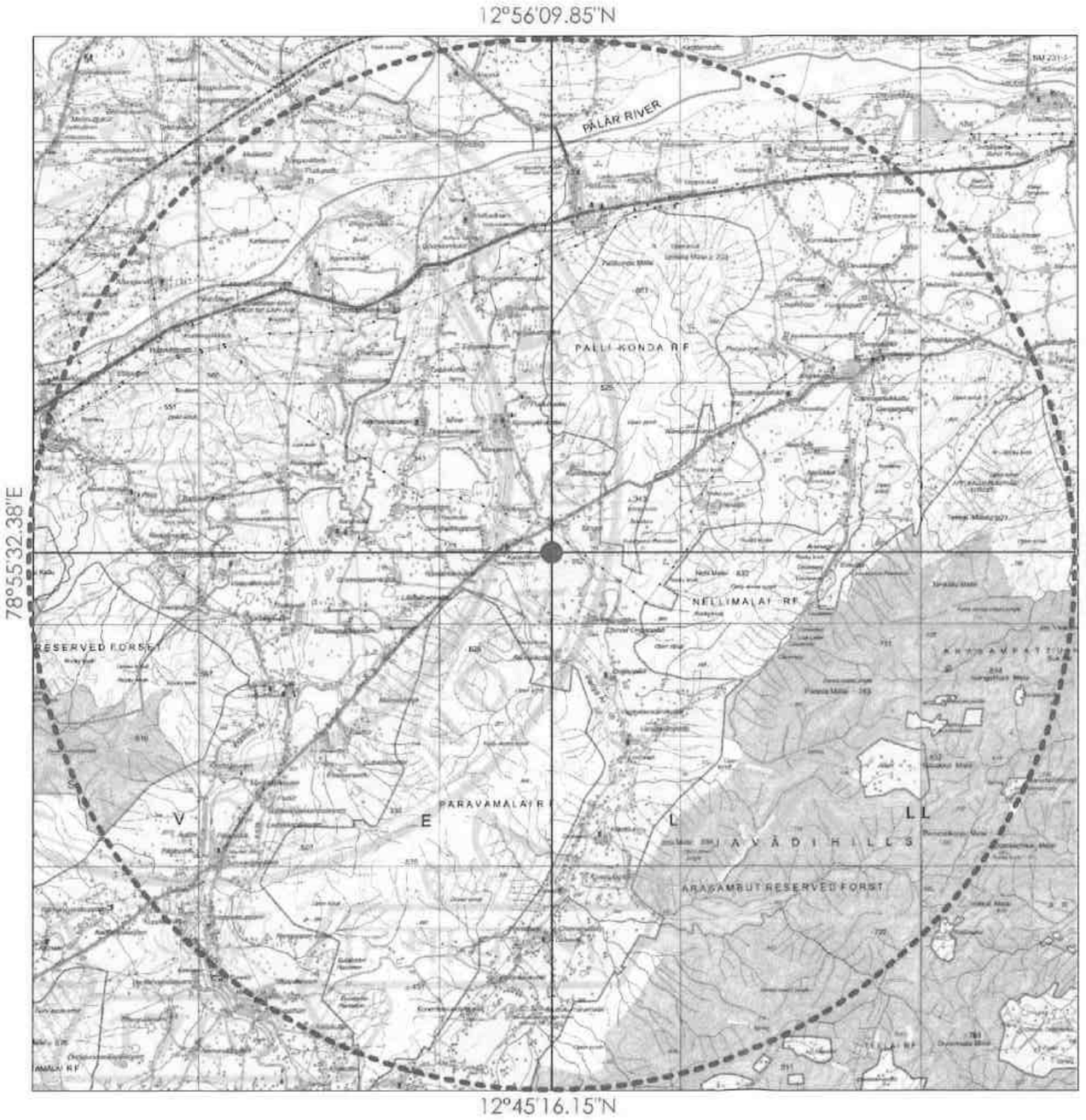
TOPO SHEET NO : 57L/ 13

LATITUDE:12°50'40.55"Nto12°50'49.50"N

LONGITUDE:78°56'07.22"Eto78°56'14.85"E

Q.L.APPLIED AREA

10KM RADIOUS



CONVENTIONAL SYMBOLS

TOPO SKETCH OF QUARRY LEASE APPLIED AREA FOR 10Km RADIUS

SCALE– 1:100000

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

C.NATARAJAN,M.Sc,M.Phil.
RECOGNIZED QUALIFIED

ANNEXURE-12



தமிழ்நாடு तमिलनाडु TAMILNADU

- 6 MAR 2023

CW 580854

R.Natarajan
147, Ayyagoundarpatti
Kollamangalam, Gudiyatham Tk
Vellore - 635 809

M. KAILASH CHAND
STAMP VENDOR-L.No.11727/C/9
SAIDAPET, CHENNAI-15. ✆:9840173098

AFFIDAVIT TO SEIAA, TAMIL NADU

Thiru.R.Natarajan, S/o.Rangasamy, residing no.147, Ayyagoundarpatti, Kollamangalam Village, Gudiyatham Taluk, Vellore District, do hereby solemnly declare and sincerely affirm that, I have applied for getting environment clearance to SEIAA, Tamil Nadu for quarry lease for Rough Stone and Gravel quarry over an extent is 2.31.50hectares of Patta land in S.F. Nos. 253/7, 259/5, 259/2 and 259/4 of Karadikudi Village, Anaicut Taluk, Vellore District, Tamil Nadu State,

1. I swear to state and confirm that within 10km area of the quarry site, we have applied for environmental clearance, none of the following is situated
   a. Protected areas notified under the wild life (Protection) Act, 1972.

   Wildlife Sanctuary: Nil within 10km Radius

   b. Critically polluted areas as notified by the central pollution control board constituted under water (Prevention and control of Pollution) Act 1974.

NOTARY
K.KAMARAJ, B.A., B.L.
Chennai City
G.O. Ms.No.59 Law Dept
DT: 28-02-2019
GOVT. OF TAMIL NADU

c. Interstate boundaries and international boundaries within 10km radius from the boundary of the proposed site.

2. I will complete the following Corporate Environment Responsibility (CER) activities before commencement of the quarrying activities.

CER Activity	Project cost (Rs)	CER cost 2.0% of Project cost (Rs)
Carrying out various developmental works in the nearby Government school based on the need.	Rs. 73,09,000/-	Rs. 1,46,180/-
Total cost Allocation	Rs. 73,09,000/-	Rs. 1,46,180/-

3. Details of quarry within 500m radius from the applied area

S. No	Name and address of the lessee	Village & Taluk	S.F.No.	Extent in Hectare	Lease Period
1)Existing Quarries					
1	S.Sumathi	Karadikudi, Anaicut Taluk	252/5	1.29.5	15.03.2018 To 14.03.2023
2	C.Venkatesan	Karadikudi, Anaicut Taluk	147/11	1.10.0	18.04.2018 To 17.04.2023
3	D.Sivakumar	Karadikudi, Anaicut Taluk	258/8	0.33.5	11.02.2019 To 10.02.2024
4	T. Balachandar	Karadikudi, Anaicut Taluk	253/6	0.44.0	05.07.2021 To 04.07.2026

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2) Expired Quarries					
1	D.Sivakumar	Karadikudi, Anaicut Taluk	425/11	1.24.5	20.10.2014 To 19.10.2019
2	R. Natarajan	Karadikudi, Anaicut Taluk	254/4	0.34.0	10.05.2017 To 09.05.2022
3) Abandoned Quarries					
1	K.Giridharan	Karadikudi, Anaicut Taluk	242/2,4, 8 & 64	1.36.0	07.06.2010 To 06.06.2015
2	R. Natarajan	Karadikudi, Anaicut Taluk	246/1, 251/3A, 253/4	2.69.0	18.07.2011 To 17.07.2016
4) Present Proposed Quarries					
1	K.Munisamy	Karadikudi, Anaicut Taluk	255/2,7 &, 358/2	2.15.5	-
2	R.Natarajan	Karadikudi, Anaicut Taluk	251/3A	1.05.5	-
3	R.Natarajan	Karadikudi, Anaicut Taluk	253/7, 259/2,4 &5	2.31.5	-
4	Trnt.Kasthuri	Karadikudi, Anaicut Taluk	253/4	1.64.0	-

The total lease within the 500m radius (Proposed + Existing + Future Proposed) (1no + 0no + 0no) works out to 10.33.5ha including this lease area.

4. There will not be hindrance or disturbance to the people living no enrooted/ nearby our quarry site while transporting the mineral and due to quarrying activities.
5. There is no approved habitation within 300m radius from the periphery of our quarry.
6. I swear that afforestation will be carried out during the course of quarrying operation and maintained.

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7. The required insurance will be taken in the name of the laborers working in our quarry site.
8. The existing road from the main road to quarry is in good condition and the same will be maintained and utilized for Transportation of Rough Stone and Gravel quarry.
9. I will not engage any child labor in our 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 our quarry.
11. No permanent structures, temple etc., are located within 500m radius from the periphery of our quarry.

    I ensure to do the social and Environment commitment as mentioned in the Mining plan to the best of our knowledge.

Notary Sign & Seal

NOTARY
K.KAMARAJ M.A., B.L.
Chennai City
G.O. Ms.No.59 Law Dept
DT: 28-02-2019
GOVT. OF TAMIL NADU

Quarry owner sign & Seal

R. Natarajan

K.KAMARAJ M.A.,B.L.,
ADVOCATE & NOTARY
Res & Office
West Mambalam
Cell: 9[illegible]0411

ANNEXURE-13

\0 /02/2023
கரடிகுடி (D.C.குப்பம்)

வேலூர் மாவட்டம், குடியாத்தம் வட்டம், கொல்லமங்களம் கிராமம் NO.26, அய்யாவு கவுண்டர் பட்டியை சேர்ந்த R.நடராஜன் த/பெ ரங்கசாமி கவுண்டர் என்பவர் பள்ளி மாணவர்களின் கல்வி வளர்ச்சிக்காக ஆண்டுதோறும் இலவசமாக நோட்டு புத்தகங்கள் மற்றும் எழுது பொருட்கள் கொடுத்து கல்வி வளர்ச்சிக்கு உறுதுணையாக இருந்து வருகிறார் என சான்று அளிக்கிறேன்.

10/2/2023

தலைமை ஆசிரியர்,
அரசு உயர் நிலைப்பள்ளி,
நேதிசெட்டிக்குப்பம் - 632 107.