LETTER HEAD

To
District Environmental Engineer (Dindigul District)
Tamilnadu Pollution Control Board,
Collectorate Complex, Dindigul -624 004.

Sub: Submission of Draft EIA/EMP report and Summary for Rough Stone and Jelly Quarry of Tvl.T & P Aggregates Private Limited at Survey No.225/2A over an extent of 3.59.0Ha in Chinnakalayamputhur village, Palani Taluk, Dindigul District, Tamil Nadu - Public Hearing_ Reg

Ref: ToR granted by SEIAA, Tamil Nadu vide letter SEIAA-TN/F.No.8833/ToR-1108/2021 dated 21.03.2022

Sir,

With reference to the above mentioned subject, we are herewith submitting the copies of Draft EIA/EMP report and Summary of EIA/EMP report in English and Tamil for Rough Stone and Jelly Quarry of Tvl.T & P Aggregates Private Limited at Survey No.225/2A over an extent of 3.59.0Ha in Chinnakalayamputhur village, Palani Taluk, Dindigul District, Tamil Nadu.

As per the terms of reference issued by SEIAA, Tamil Nadu referred to as (1) above, point no. 39 stipulates conduction of public hearing. We request you to process our proposal towards conducting public hearing at the earliest towards the same.

Here with enclosed D.D No – dated for public hearing.

Thank you.

Yours Faithfully,
For **Tvl.T & P Aggregates Private Limited**

Encl: as above

DRAFT EIA / EMP REPORT

FOR

ROUGSHTONE AND JELLY QUARRY

Extent	3.59 Ha
Survey No	225/2A
Type of Land	Patta Land
Lease Period	10 Years

CHINNAKALAYAMPUTHUR VILLAGE, PALANI TALUK, DINDIGUL DISTRICT, TAMILNADU STATE.

Year	PRODUCTION CAPACITY IN M3			Depth in m
	Rough Stone	Weathered rock	Topsoil	
1 to 5	4,00,510	26,520	55,212	23m
6 to 10	2,36,180	-		25m
Total	6,36,690	26,520	55,212	48

- Terms of Reference issued by SEIAA, Tamil Nadu vide SEIAA-TN/F.No.8833/ToR-1108/2021 dated 21.03.2022.
- Baseline Monitoring Period – March 2022 – May 2022 (Summer Season)

PROJECT PROPONENT

T&P AGGREGATES PVT. LTD

Chinnakalayamputhur, Palani Taluk, Dindigul – 624601.

CONSULTANT

CREATIVE ENGINEERS & CONSULTANTS

NABET ACCREDITED CONSULTANCY, NABL ACCREDITED LAB

9B/4, Bharathwajar Street, East Tambaram, Chennai-600059.

Ph: 044-22395170, Cell: 09444133619

Email : cecgiri@yahoo.com,

Creating Possibilities

Sector 1(a), Category B1

AUGUST 2022

REVISIONS OF EIA/EMP REPORT

Revision number	Report Status	Date of submission
00/AUG/22	Draft EIA /EMP Report	20.08.2022

Environmental Impact Assessment & Environmental Management Plan Report for **Roughstone and Jelly Quarry of Tvl. T&P Aggregates Private Limited** over an area of 3.59.0Ha in Chinnakalayamputhur village, Palani Taluk, Dindigul District, Tamil Nadu was prepared by Creative Engineers & Consultants and authorized for submission by Mr. P.Giri, EIA Coordinator, CEO, of Creative Engineers & Consultants on 20.08.2022 after due review by the personnel and consultation with Tvl.T & P Aggregates Private Limited. Current Revision number of the EIA/EMP report is 00/AUG/22, signifying as per the revision mentioned in the above table that this is a draft EIA/EMP report.

PROJECT PROPONENT DECLARATION

We, M/s. T&P Aggregates Private Limited received ToR under EIA Notification 2006 from SEIAA, Tamil Nadu vide their SEIAA-TN/F.No.8833/ToR-1108/2021 dated 21.03.2022 for Rough Stone and Jelly Quarry over an area of 3.59 Ha in Chinnakalayamputhur Village, Palani Taluk, Dindigul District, Tamil Nadu.

We have entrusted the EIA study to M/s. Creative Engineers & Consultants (CEC), Chennai who have been accredited by the National Accreditation Board for Education & Training (NABET), Quality Council of India with their accreditation valid upto 23.03.2023.

The Environmental Impact Assessment (EIA) and Environmental Management Plan (EMP) have been prepared as per the generic structure proposed in the EIA notification 2006, ToR issued by SEIAA, Tamil Nadu. The prescribed ToR along with compliance is also incorporated in the EIA/EMP Report.

This report is prepared based on the information and data obtained from the Mining Plan and other records and the field study carried out by the consultant. The data given in the EIA/EMP report are factually correct to the best of our knowledge.

For Tvl.T & P Aggregates Private Limited

Rijo Jose Tharayil
(Managing Director)

Date : 20.08.2022

Place: Palani

EIA Consultant Undertaking

[In compliance with MoEF Office Memorandum No. J-11013/41/2006-IA.II (I) dated 04.08.2009]

Creative Engineers & Consultants (CEC) is an NABL accredited testing Laboratory, and also NABET accredited Category–A environment consultancy organization for preparing EIA/EMP reports for the sectors Mining of minerals, Thermal power plants, Mineral Beneficiation & Cement plants.

CEC has been accredited by the National Accreditation Board for Education & Training (NABET), Quality Council of India for empanelment of EIA Consultants. The Certificate of Reaccreditation is issued with validity up to 23.03.2023.

M/s. T&P Aggregates Private Limited received ToR under EIA Notification 2006 from SEIAA, Tamil Nadu vide their SEIAA-TN/F.No.8833/ToR-1108/2021 dated 21.03.2022 for Rough Stone and Jelly Quarry over an area of 3.59 Ha in Chinnakalayamputhur Village, Palani Taluk, Dindigul District, Tamil Nadu.

The prescribed TOR is complied with and incorporated in the EIA Report and submitted. This report is based on the information and data obtained from Approved Mining Plan, other records and data from the field study by CEC. The data generated and given in the EIA/EMP Report are factually correct. The sample analyses are carried out through CEC's laboratory.

(P. Giri)
Chief Executive & EIA Coordinator
Creative Engineers & Consultants

9/4b, Bharathwajar Street, East Tambaram, Chennai – 600 059.
Ph : 22395170, 9444133619, fax : 91-44-22396643.
e-mail : cecgiri@yahoo.com, web : www.creativeengineers.co.in

Annexure – VII

Declaration by Experts contributing to the EIA Report for

Rough Stone and Jelly Quarry of T&P Aggregates Private Limited over an extent of 3.59 Ha at S.F.No.225/2A in Chinnakalayamputhur Village, Palani Taluk, Dindigul District, Tamil Nadu.

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

EIA coordinator:
Name: **P.Giri**
Signature and Date:
Period of involvement: **September 2021 onwards**
Contact information: **09444133619, 044-22395170**

Functional area experts:

S. No.	Functional areas	Name of the expert/s	Involvement (period and task**)	Signature and date
1	AP*	**P.Giri**	• **Identification of baseline monitoring stations and study of the monitored data with respect to the applicable standards.** • **Identification of sources of air pollution comprising dust, gaseous emission due to mining & other activities** • **Identification of Impacts & suggestion of mitigation measures** **Period: September 2021 onwards**	
		B.Swamynathan	• **Data interpretation of Micro meteorological data for wind rose.** • **Identification of polluting source and suggestion of suitable mitigation measures.** **Period: March 2022 onwards**	
2	WP*	**V.Sivaranjani**	• **Study of the monitored data with respect to the applicable standards.** • **Identification of Water requirement & Source** • **Preparation of water balance diagram** • **Identification of Water polluting sources** • **Impact of the project on the water quality, both surface and groundwater**	

			• **Suggestion of Mitigation measures to control water pollution** **Period: June 2022 onwards**	
		G.Sandhya- FAA	• **Assisting FAE with identification of impact of the project on the water quality and suggestion of suitable mitigation measures.** • **Associated with FAE in preparation of sections relevant to WP functional area in the EIA/EMP report.** **Period: June 2022onwards**	
3	SHW*	**P.Giri**	• **Quantification of mineral & waste from mining operation** • **Waste disposal method evaluation** • **Providing dump management plan** • **Providing Surface Runoff Management Structure Requirements.** • **Identification of Hazardous waste and its details of disposal** **Period: September 2021 onwards**	
4	SE*	**R.Baburaj**	• **Identification of villages in the study area and finalization of demographic profile of the villages within the study area.** • **Preparation of sections relevant to SE functional area in the EIA/EMP report** **Period: March 2022 onwards**	
5	EB*	**B.Swamynathan**	• **Perusal of existing data relevant to this project.** • **Studying the details of flora and fauna, separately for core, buffer zone and forest area based on primary field survey.** • **Identification of species , Indicating the Schedule of the fauna present in the study area** • **Assessment of impact on Biological environment and suggestion of mitigative measures** • **Collecting & providing details of existing and proposed Green belt development /plantation in the core zone** **Period: March 2022 onwards**	
6	HG*	**K.Shankar**	• **Study of existing surface drainage arrangements in the core and buffer zone, impact due to mining on these drainage courses and suggestion of mitigative measures** • **Perusal of site specific ground water table details for**	

			the core zone and the study area. • **Studied the hydrological aspects of surface and groundwater in study area** • **Study about impact on the hydrology due to mining operation** • **Suggesting mitigative measures like RWH for enhancement of ground water level** **Period: March 2022 onwards**	
7	GEO*	**K.Shankar**	• **Study of geology of the ML area and the surrounding areas.** • **Provide details about Mineral composition** **Period: March 2022 onwards**	
8	SC*	**B.Swamynathan**	• **Study of soil profile** • **Assessment of Impact on soil and suggesting plantation scheme.** **Period: March 2022 onwards**	
9	AQ*	**V.Sivaranjani**	• **Quantification of emission particulars** • **Air quality modelling for post project impact on the air quality prediction of the study area.** **Analysis of the Isopleth generated** • **Arriving at the post project concentration at the AAQ monitoring locations** **Period: June 2022 onwards**	
		G.Sandhya-FAA	• **Assisting FAE calculation of the emission rates** • **Preparation of meteorological data in suitable form for input into the model** • **Simulation of model for generation of Isopleth and data interpretation.** • **Studying the impact on AAQ monitoring locations due to the generated emissions.** • **Associated with FAE in preparation of sections relevant to AQ functional area in the EIA/EMP report.** **Period: June 2022 onwards**	
10	NV*	**P.Giri**	• **Identification of baseline monitoring stations and study of the monitored data with respect to the applicable standards.** • **Predict the noise level and vibration level due to proposed mining operation based on scientific evaluation.** • **Suggesting the Mitigation measures to control noise**	

			pollution, Suggesting the Mitigation measures to control ground vibration **Period: September 2021 onwards**	
11	LU	**B.Swamynathan**	• **Collection of Remote sensing satellite data to study the land use pattern.** • **Primary field survey and limited field verification** • **Preparation of Land use map using Satellite data of the project area separately for the core zone and the buffer zone and providing the land use pattern.** **Period: March 2022 onwards**	
12	RH*	**K.Shankar**	• **Identified Major risks involved in the project Mitigation measures suggested to avoid risk.** • **Preparation of onsite and offsite emergency management plan** **Period: March 2022 onwards**	

*One TM against each FAE may be shown
**Please attach additional sheet if required

Declaration by the Head of the accredited consultant organization/ authorized person

I, **P.Giri** hereby, confirm that the above mentioned experts prepared the EIA report for **Rough Stone and Jelly Quarry of T&P Aggregates Private Limited over an extent of 3.59 Ha at S.F.No.225/2A in Chinnakalayamputhur Village, Palani Taluk, Dindigul District, Tamil Nadu.**

I also confirm that EIA Coordinator (EC) has gone through the report, and the consultant organization shall be fully accountable for any misleading information. It is certified that no unethical practices, plagiarism involved in carrying out the work and external data / text has not been used without proper acknowledgement while preparing this EIA report.

Signature:

Name: **P.Giri**

Designation: **Chief Executive**

Name of the EIA consultant organization: **Creative Engineers & Consultants, Chennai – 59**
NABET Certificate No. & Issue Date: **No- NABET/EIA/2023/RA 0187 & date Dec 18th, 2020**

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* * * * * * * *

TERMS OF REFERENCE & ITS COMPLIANCE

सत्यमेव जयते

TMT.P.RAJESWARI, I.F.S.,
MEMBER SECRETARY

STATE LEVEL ENVIRONMENT IMPACT ASSESSMENT AUTHORITY – TAMIL NADU
3rd Floor, Panagal Maaligai,
No.1, Jeenis Road, Saidapet,
Chennai-15.
Phone No. 044-24359973
Fax No. 044-24359975

TERMS OF REFERENCE (ToR)

Lr No.SEIAA-TN/F.No.8833/ToR-1108/2021 Dated: 21.03.2022.

To

Tvl.T &P Aggregates Private Limited
Chinnakalayamputhur
Palani Taluk
Dindigul District-624601

Sir / Madam,

Sub: SEIAA, Tamil Nadu – Terms of Reference with public Hearing (ToR) for the proposed Rough stone and Jelly quarry lease over an extent of 3.59.0Ha at S.F.No.225/2A of Chinnakalayamputhur Village, Palani Taluk, Dindigul District, Tamil Nadu by Tvl.T&P Aggregates Private Limited - 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/68195/2021 Dt.07.10.2021
2. Your application submitted for Terms of Reference dated: 07.10.2021.
3. Minutes of the 250th SEAC meeting held on 03.03.2022
4. Minutes of the 494th Authority meeting held on 21.03.2022.

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

The proponent, Tvl.T&P Aggregates Private Limited has submitted application for Terms of Reference (ToR) with public Hearing on 07.10.2021, in Form-I, Pre- Feasibility report for the

MEMBER SECRETARY
SEIAA-TN

proposed Rough stone and Jelly quarry lease over an extent of 3.59.0Ha at S.F.No.225/2A of Chinnakalayamputhur Village, Palani Taluk, Dindigul District, Tamil Nadu.

Discussion by SEAC and the Remarks:-

Proposed Rough stone and Jelly quarry lease over an extent of 3.59.0 Ha at S.F.No.225/2A of Chinnakalayamputhur Village, Palani Taluk, Dindigul District, Tamil Nadu by Tvl.T&P Aggregates Private Limited - For Terms of Reference.

(SIA/TN/MIN/ 68195/2021 Dt.07.10.2021)

The proposal was placed in 250th SEAC meeting held on 03.03.2022. The details of the project furnished by the proponent are given in the website (parivesh.nic.in).

The SEAC noted the following:

1. The Project Proponent, Tvl.T&P Aggregates Private Limited has applied for Terms for Reference for the proposed Rough stone and Jelly quarry lease over an extent of 3.59.0 Ha at S.F.No.225/2A of Chinnakalayamputhur Village, Palani Taluk, Dindigul District, Tamil Nadu.
2. The project/activity is covered under Category "B1" of Item 1(a) "Mining Projects" of the Schedule to the EIA Notification, 2006.
3. The Production for the five years states that total quantity should not exceed 4,00,510 m^3 of rough stone, 26,520 m^3 weathered rock & 55,212m^3 of topsoil with a ultimate depth of mining is 23m below ground level.

Based on the presentation made by the proponent and the documents furnished, SEAC decided to **recommend the proposal for the grant of Terms of Reference (TOR) with Public Hearing** for the Production for the five years states that total quantity should not exceed 4,00,510 m^3 of rough stone, 26,520 m^3 weathered rock & 55,212m3 of topsoil with a ultimate depth of mining is 23m below ground level, Subject to the following TORs is in annexure of this minutes, 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 shall carry out the Cumulative & comprehensive impact study due to mining operations carried out in the quarry specifically with reference to the environment in terms of air pollution, water pollution, impact on existing agricultural operations & health impacts, accordingly the Environment Management plan should be prepared keeping the concerned quarry and the surrounding habitations in the mind.

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2. 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,
    a) What was the period of the operation and stoppage of the earlier mines with last work permit issued by the AD/DD mines?
    b) Quantity of minerals mined out.
    c) Highest production achieved in any one year
    d) Detail of approved depth of mining.
    e) Actual depth of the mining achieved earlier.
    f) Name of the person already mined in that leases area.
    g) If EC and CTO already obtained, the copy of the same shall be submitted.
    h) Whether the mining was carried out as per the approved mine plan (or EC if issued) with stipulated benches.
3. 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).
4. 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.
5. 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.
6. 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.
7. 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 /

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TWAD so as to assess the impacts on the wells due to mining activity. Based on actual monitored data, it may clearly be shown whether working will intersect groundwater. Necessary data and documentation in this regard may be provided.

8. 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.
9. 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.
10. A detailed mine closure plan for the proposed project shall be included in EIA/EMP report which should be site-specific.
11. The Public hearing advertisement shall be published in one major National daily and one most circulated vernacular daily.
12. The recommendation for the issue of "Terms of Reference" is subjected to the outcome of the Hon'ble NGT, Principal Bench, New Delhi in O.A No.186 of 2016 (M.A.No.350/2016) and O.A. No.200/2016 and O.A.No.580/2016 (M.A.No.1182/2016) and O.A.No.102/2017 and O.A.No.404/2016 (M.A.No.758/2016, M.A.No.920/2016, M.A.No.1122/2016, M.A.No.12/2017 & M.A. No. 843/2017) and O.A.No.405/2016 and O.A.No.520 of 2016 (M.A.No.981/2016, M.A.No.982/2016 & M.A.No.384/2017).
13. 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** in consultation with the DFO, State Agriculture University and local school/college authorities. The plant species with dense/moderate canopy of native origin should be chosen. Species of small/medium/tall trees alternating with shrubs should be planted in a mixed manner.
14. Taller/one year old Saplings raised in appropriate size of bags, preferably eco-friendly bags should be planted in proper spacing as per the advice of local forest authorities/botanist/Horticulturist with regard to site specific choices. The proponent shall earmark the greenbelt area with GPS coordinates all along the boundary of the project site with at least 3 meters wide and in between blocks in an organized manner.
15. A Disaster management Plan shall be prepared and included in the EIA/EMP Report.

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16. A Risk Assessment and management Plan shall be prepared and included in the EIA/EMP Report.
17. 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.
18. 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.
19. The PP shall use drone video to cover the cluster area showing clearly the extent of operation and the surrounding environment and submit the video as part of EIA report.
20. 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 Reference besides attracting penal provisions in the Environment (Protection) Act, 1986.

Appendix

List of Native Trees for Planting

1. *Aegle marmelos* – Vilvam
2. *Adenaanthera pavonina* - Manjadi
3. *Albizia lebbeck* – Vaagai
4. *Albizia amara* - Usil
5. *Bauhinia purpurea* - Mantharai
6. *Bauhinia racemosa* - Aathi
7. *Bauhinia tomentosa* – Iruvathi
8. *Buchanania aillaris* - Kattuma
9. *Borassus flabellifer* - Panai
10. *Butea monosperma* - Murukka maram
11. *Bobax ceiba* – Ilavu, Sevvilavu
12. *Calophyllum inophyllum* - Punnai
13. *Cassia fistula* - Sarakondrai
14. *Cassia roxburghii*- Sengondrai
15. *Chloroxylon sweitenia* - Purasa maram
16. *Cochlospermum religiosum* – Kongu, Manjal Ilavu

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17. *Cordia dichotoma* – Mookuchali maram
18. *Creteva adansonii* – Mavalingum
19. *Dillenia indica* – Uva, Uzha
20. *Dillenia pentagyna* – Siru Uva, Sitruzha
21. *Diospyros ebenum* - Karungali
22. *Diospyros chloroxylon* – Vaganai
23. *Ficus amplissima* – Kal Itchi
24. *Hibiscus tiliaceous* – Aatru poovarasu
25. *Hardwickia binata* – Aacha
26. *Holoptelia integrifolia* - Aayili
27. *Lannea coromandelica* - Odhiam
28. *Lagerstroemia speciosa* - Poo Marudhu
29. *Lepisanthus tetraphylla* - Neikottai maram
30. *Limonia acidissima* - Vila maram
31. *Litsea glutinosa* –Pisin pattai
32. *Madhuca longifolia* - Illuppai
33. *Manilkara hexandra* – Ulakkai Paalai
34. *Mimusops elengi* - Magizha maram
35. *Mitragyna parvifolia* - Kadambu
36. *Morinda pubescens* – Nuna
37. *Morinda citrifolia* – Vellai Nuna
38. *Phoenix sylvestre* - Eachai
39. *Pongamia pinnata* – Pungam
40. *Premna mollissima* – Munnai
41. *Premna serratifolia* – Narumunnai
42. *Premna tomentosa* - Purangai Naari, Pudanga Naari
43. *Prosopis cinerea* - Vanni maram
44. *Pterocarpus marsupium* - Vengai
45. *Pterospermum canescens* – Vennangu, Tada
46. *Pterospermum xylocarpum* - Polavu
47. *Puthranjiva roxburghii* – Puthranjivi
48. *Salvadora persica* – Ugaa Maram
49. *Sapindus emarginatus* - Manipungan, Soapu kai
50. *Saraca asoca* - Asoca
51. *Streblus asper* - Piraya maram
52. *Strychnos nuxvomica* – Yetti
53. *Strychnos potatorum* - Therthang Kottai
54. *Syzygium cumini* - Naval

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55. *Terminalia bellerica* - Thandri
56. *Terminalia arjuna* - Ven marudhu
57. Toona ciliate - Sandhana vembu
58. Thespesia populnea - Puvarasu
59. Walsura trifoliata - valsura
60. Wrightia tinctoria - Vep

Discussion by SEIAA and the Remarks:-

The subject was placed in the 494th Authority meeting held on 21.03.2022. 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 condition in addition to the following conditions:

1. 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.
2. 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.
3. 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.
4. Action should specifically suggest for sustainable management of the area and restoration of ecosystem for flow of goods and services.
5. The project proponent shall study impact on fish habitats and the food WEB/ food chain in the water body and Reservoir.
6. The Terms of Reference should specifically study impact on soil health, soil erosion, the soil physical, chemical components and microbial components.
7. The Environmental Impact Assessment should study impact on forest, vegetation, endemic, vulnerable and endangered indigenous flora and fauna.

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8. The Environmental Impact Assessment should study impact on standing trees and the existing trees should be numbered and action suggested for protection.
9. The Environmental Impact Assessment should study on wetlands, water bodies, rivers streams, lakes and farmer sites.
10. The Environmental Impact Assessment should hold detailed study on EMP with budget for Green belt development and mine closure plan including disaster management plan.
11. The Environmental Impact Assessment should study impact on climate change, temperature rise, pollution and above soil & below soil carbon stock.
12. The Environmental Impact Assessment should study impact on protected areas, Reserve Forests, National Parks, Corridors and Wildlife pathways, near project site.
13. The project proponent shall study and furnish the impact of project on plantations in adjoing patta lands, Horticulture, Agriculture and livestock.
14. The project proponent shall study and furnish the details on potential fragmentation impact of natural environment, by the activities.
15. 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.
16. 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.
17. The project proponent shall detailed study on impact of mining on Reserve forests free ranging wildlife.

A. STANDARD TERMS OF REFERENCE

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

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with one another in terms of the mine lease area, production levels, waste generation and its management, mining technology etc. and should be in the name of the lessee.

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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implementing the same should be made as part of the project cost.

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

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

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

22) One season (non-monsoon) [i.e. March-May (Summer Season); October-December (post monsoon season) ; December-February (winter season)]primary baseline data on ambient air quality as per CPCB Notification of 2009, water quality, noise level, soil and flora and fauna shall be collected and the AAQ and other data so compiled presented date-wise in the EIA and EMP Report. Site-specific meteorological data should also be collected. The location of the monitoring stations should be such as to represent whole of the study area and justified keeping in view the pre-dominant downwind direction and location of sensitive receptors. There should be at least one monitoring station within 500 m of the mine lease in the pre-dominant downwind direction. The mineralogical composition of PM10, particularly for free silica, should be given.

23) Air quality modeling should be carried out for prediction of impact of the project on the air quality of the area. It should also take into account the impact of movement of Vehicles for

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transportation of mineral. The details of the model used and input parameters used for modeling should be provided. The air quality contours may be shown on a location map clearly indicating the location of the site, location of sensitive receptors, if any, and the habitation. The wind roses showing pre-dominant wind direction may also be indicated on the map.

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

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

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

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

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

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

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

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

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emphasis on local and native species and the species which are tolerant to pollution.

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

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

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

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

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

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

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

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

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

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

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

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

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

a) Executive Summary of the EIA/EMP Report

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

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

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

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

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

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

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

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

j) The EIA report should also include (i) surface plan of the area indicating contours of main topographic features, drainage and mining area, (ii) geological maps and sections

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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.
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

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other industries, forest , eco-sensitive zones, accessibility, (note - in case of industrial estate this information may not be necessary)

18. Baseline environmental data - air quality, surface and ground water quality, soil characteristic, flora and fauna, socio-economic condition of the nearby population
19. Identification of hazards in handling, processing and storage of hazardous material and safety system provided to mitigate the risk.
20. Likely impact of the project on air, water, land, flora-fauna and nearby population
21. Emergency preparedness plan in case of natural or in plant emergencies
22. Issues raised during public hearing (if applicable) and response given
23. CER plan with proposed expenditure.
24. Occupational Health Measures
25. Post project monitoring plan
26. The project proponent shall carry out detailed hydro geological study through intuitions/NABET Accredited agencies.
27. A detailed report on the green belt development already undertaken is to be furnished and also submit the proposal for green belt activities.
28. The proponent shall propose the suitable control measure to control the fugitive emissions during the operations of the mines.
29. A specific study should include impact on flora & fauna, disturbance to migratory pattern of animals.
30. Reserve funds should be earmarked for proper closure plan.
31. A detailed plan on plastic waste management shall be furnished. Further, the proponent should strictly comply with, Tamil Nadu Government Order (Ms) No.84 Environment and forests (EC.2) Department dated 25.06.2018 regarding ban on one time use and throw away plastics irrespective of thickness with effect from 01.01.2019 under Environment (Protection) Act, 1986. In this connection, the project proponent has to furnish the action plan.

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

a. A note confirming compliance of the TOR, with cross referencing of the relevant sections / pages of the EIA report should be provided.
b. All documents may be properly referenced with index, page numbers and continuous page numbering.

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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 will take further necessary action for obtaining environmental clearance in accordance with the procedure prescribed under the EIA Notification, 2006.
- The final EIA report shall be submitted to the SEIAA, Tamil Nadu for obtaining Environmental Clearance.
- The TORs with public hearing prescribed shall be **valid for a period of three years** from the date of issue, for submission of the EIA/EMP report as per OMNo.J-11013/41/2006-IA-II(I)(part) dated 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, Dindigul District.
7. The EO/BDO, Chinnakalayamputhur Village, Palani Taluk, Dindigul District
8. Stock File.

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TOR COMPLIANCE

S.No	ToR Points	Reply	Pg. No
A. ToR in Addition to Standard ToR			
1.	The Proponent shall carry out the cumulative & comprehensive environmental impact assessment study due to mining operations carried out in the quarry cluster specifically with reference to the environment in terms of air pollution, water pollution, & health impacts, and accordingly the Environment Management plan should be prepared keeping the concerned quarry and the surrounding habitations in the mind.	• **The details of other quarries located in 500m radius of the project is provided in Annexure-12. The baseline monitoring carried out for this project reflects the cumulative impact of this existing quarry.** **The identification of impact due to air, water, health impacts etc. has been carried out in Chapter-IV. The environmental management plan has been provided elaborately in Chapter-X.**	**A-20** **4-1** **10-1**
2	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 a) What was the period of the operation and stoppage of the earlier mines with last work permit issued by the AD/DD mines? b) Quantity of minerals mined out. c) Highest production achieved in any one year d) Detail of approved depth of mining. e) Actual depth of the mining achieved earlier. f) Name of the person already mined in that leases area. g) If EC and CTO already obtained, the copy of the same shall be submitted. h) Whether the mining was carried out as per the approved mine plan (or EC if issued) with stipulated benches.	**This is a proposed project. No mining has been carried out in this lease area so far by the proponent.**	**2-12**
3	All corner coordinates of the mine lease area, superimposed on a High Resolution Imagery/Topo sheet, topographic sheet,	• **Project coordinates superimposed in satellite imagery and given as Figure No - 2.4 in Chapter – II.**	**2-6**

	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).	**The 10km Radius Index plan showing buffer zone is given in Figure No.3.1 in Chapter – III.**	**3-2**
4	The proponent shall furnish photographs of adequate fencing, green belt along the periphery including replantation of existing trees & safety distance between the adjacent quarries & water bodies nearby provided as per the approved mining plan.	• **Photographs of the site are provided in Chapter-II.** • **Green netting will be carried out around the lease periphery on the other sides.**	**2-7**
5	The Project Proponent shall provide the details of mineral reserves and mineable reserves, planned production capacity, proposed working methodology with justifications, the anticipated impacts of the mining operations on the surrounding environment and the remedial measures for the same.	• **The details of the geological and mineable reserves are provided in Table No.2.3, Chapter-II.** • **The mining method will be Opencast semi mechanized mining using jackhammer drilling, blasting, excavation through excavator & mineral transport through tippers.** • **The production schedule during plan period is given in Table No.2.6, Chapter-II.** • **Anticipated Impacts of the mining operations and mitigation measures are discussed elaborately in Chapter-IV.**	**2-10** **2-12** **4-1**
6	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.	• **The organization chart has been provided in Figure No.10.1, Chapter-X.**	**10-3**
7	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	**Details of hydrogeological scenario of this project is provided under section 3.6, Chapter-III.**	**3-44**

	monsoon and non-monsoon seasons from the PWD / TWAD so as to assess the impacts on the wells due to mining activity. Based on aetual monitored data, it may clearly be shown whether working will intersect groundwater. Necessary data and documentation in this regard may be provided.		
8	The proponent shall furnish the baseline data for the environmental and ecological parameters with regard to surface water/ground water quality, air quality, soil quality & flora/fauna including traffic/vehicular movement study.	**The baseline data on micro- meteorology, ambient air quality, Water quality, noise level, soil and flora & fauna are collected during Summer Season (March 2022 to May 2022) and detailed in Section 3.3 to 3.5 of Chapter-III. The details of Traffic Study is provided under Section 4.9, Chapter-IV.**	**3-12 & 3-35** **4-24**
9	A tree survey study shall be carried out (nos., name of the species, age, diameter etc.,) both within the mining lease applied area & 300m buffer zone and its management during mining activity.	**The details of flora in the core zone, project impact zone (PIZ) and the buffer zone are provided from Table No.3.23–3.24, Chapter-III.**	**3-38 3-39**
10	A detailed mine closure plan for the proposed project shall be included in EIA/EMP report which should be site-specific.	**Details of Mine Closure Plan is provided under section 7.5, Chapter-VII.**	**7-4**
11	The Public hearing advertisement shall be published in one major National daily and one most circulated vernacular daily.	**Agreed.**	**--**
12	The recommendation for the issue of "Terms of Reference" is subjected to the outcome of the Hon'ble NGT, Principal Bench, New Delhi in O.A No.186 of 2016 (M.A.No.350/2016) and O.A. No.200/2016 and 0.A.No.580/2016 (M.A.No.1182/2016) and 0.A.No.102/2017 and 0.A.No.404/2016 (M.A.No.758/2016, M.A.No.920/2016, M.A.No.1122/2016, M.A.No.12/2017 & M.A. No. 843/2017) and O.A.No.405/2016 and O.A.No.520 of 2016 (M.A.NO.981/2016, M.A.No.982/2016 & M.A.No .384/2017).	**Agreed.**	**--**
13	The purpose of Green belt around the project is to capture the fugitive emissions, carbon sequestration and to attenuate the noise	**In the lease area, safety barrier 7.5m around the periphery, 50m safety distance**	**4-20**

	generated, in addition to improving the aesthetics. A wide range of indigenous plant species should be planted as given in the appendix in consultation with the DFO, State Agriculture University and local school/college authorities. The plant species with dense/moderate canopy of native origin should be chosen. Species of small/medium/tall trees alternating with shrubs should be planted in a mixed manner.	**for the c power line in the eastern ide of the lease area. Greenbelt / Plantation will be carried out to enhance the vegetative growth and aesthetic in the safety zone area. About 500 trees will be planted in and around the lease area. Details are given in Table No.4.16, Chapter-IV.**	
14	Taller/one year old Saplings raised in appropriate size of bags, preferably eco-friendly bags should be planted in proper spacing as per the advice of local forest authorities/botanist/Horticulturist with regard to site specific choices. The proponent shall earmark the greenbelt area with GPS coordinates all along the boundary of the project site with at least 3 meters wide and in between blocks in an organized manner.	**Agreed.**	**--**
15	A Disaster management Plan shall be prepared and included in ;he,EIA/EMP Report.	**The disaster management plan has been provided under section 7.3.1, Chapter-VII.**	**7-2**
16	A Risk Assessment and management Plan shall be prepared and included in the EIA/EMP Report.	**Details about Risk Assessment has been provided under section 7.3, Chapter-VII.**	**7-1**
17	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.	• **Nearby villages were visited for conducting study to know about socio-economic conditions, including aspirations and requirements of the people for a better living and collected relevant data. The details are provided under section 3.2.4, Chapter-III.** • **Towards the socio economic development of the surrounding area, the proponent has earmarked an amount of Rs.5 Lakhs under Corporate Environmental Responsibility. The activities identified under CER will be implemented in a phased manner in the nearby Government schools. In consultation with the locals based on the need & priority it will be implemented.**	**3-9** **4-22**

18	If any quarrying operations were carried out in the proposed quarrying site for which now the EC is sought, the Project Proponent shall furnish the detailed compliance to EC conditions given in the previous EC with the site photographs which shall duly be certified by MoEF&CC, Regional office, Chennai (or) the concerned DEE/TNPCB.	**Not Applicable**	**--**
19	The PP shall use drone video to cover the cluster area showing clearly the extent of operation and the surrounding environment and submit the video as part of EIA report.	**Under process**	**--**
20	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 Reference besides attracting penal provisions in the Environment (Protection) Act, 1986"	**Agreed.**	**--**

B. Additional ToR			
1	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.	• **This draft EIA/EMP report will be exposed to public consultation as per mandatory procedures through the District Collector and State Pollution Control Board officials after giving 30 days advance notice in two local newspapers about the scheduled date and time for conduct of the public hearing procedures.** • **The opinions, concerns and objections of stakeholders will be recorded during the public hearing. All the public queries and the replies to the query by the project proponent and officials concerned will be recorded and incorporated in the EIA/EMP report for approval by SEIAA, Tamil Nadu.**	**7-1**
2	The Environmental Impact Assessment shall study in detail the carbon emission and also suggest the measures to mitigate carbon	**Considering that the quantum of production is less, only 1 excavator, 4 tippers will be**	**4-3**

	emission including development of carbon sinks and temperature reduction including control of other emission and climate mitigation activities.	**engaged. These equipments will be properly and regularly maintained. Besides, as mentioned earlier, 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 500 number of plants will be planted in and around the lease area.**	
3	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.	**An ecological survey of the study area was conducted with reference to listing of species and assessment of the existing baseline ecological conditions. Details are provided under section 3.5.1, Chapter-III.**	**3-35**
4	Action should specifically suggest for sustainable management of the area and restoration of ecosystem for flow of goods and services.	**. In the post mining stage, entire 2.76 Ha of mined out area will be left as water body, 0.02 Ha will be the mine roads, 0.01Ha will be infrastructure, 0.30 Ha Ha will be covered with vegetation and 0.50Ha will be left undisturbed. The land use during the post operational period is given under Table No.4.16, Chapter-IV.**	**4-20**
5	The project proponent shall study impact on fish habitats and the food WEB/ food chain in the water body and Reservoir.	**There is no major perennial waterbody in close proximity of the lease area.**	**--**
6	The Terms of Reference should specifically study impact on soil health, soil erosion, the soil physical, chemical components and microbial components.	• **Soil samples were collected in 3 locations in the core and buffer zone to analyse the physiochemical characteristics of the soil in the area. The soil quality data is provided in Table No.3.18, Chapter-III.** • **The soil of the study area is characterized by Entisols, Inceptisol, Alfisols.The lease are falls under the category of Inceptisol. The soil map is provided in Figure No.3.22, Chapter-III.** • **Topsoil will be used for bund formation and for plantation purposes.**	**3-30** **3-48**

7	The Environmental Impact Assessment should study impact on forest, vegetation, endemic, vulnerable and endangered indigenous flora and fauna.	**An ecological survey of the study area was conducted with reference to listing of species and assessment of the existing baseline ecological conditions. Details are provided under section 3.5.1, Chapter-III.**	**3-35**
8	The Environmental Impact Assessment should study impact on standing trees and the existing trees should be numbered and action suggested for protection.	**Replied in Additional ToR Point No.7.**	**--**
9	The Environmental Impact Assessment should study on wetlands, water bodies, rivers streams, lakes and farmer sites.	• **The nearest major water bodies include Pachaiyar R - 5.1km - (S), Varattar R - 5.4km – (SE), Porandalar R- 6.0Km(SE), Palar-6.6Km(SE), Kudiraiyar R -6.8Km(W).** • **There is a drainage channel passing on the south eastern side of the lease area at a distance of 55m from the lease area. There is also an odai at a distance of 350m on the south eastern side. There is no proposal to discharge any effluent into this water body. No major impact is envisaged on the nearby water bodies due to project operations.**	**3-3** **4-11**
10	The Environmental Impact Assessment should hold detailed study on EMP with budget for green belt development and mine closure plan including disaster management plan.	• **Detailed environmental management plan is provided in Chapter-X.** • **The environmental management cost is provided under Table No.10.1, Chapter-X.** • **Disaster management plan is provided under section 7.3.1 Chapter-VII.**	**10-1** **7-2**
11	The Environmental Impact Assessment should study impact on climate change, temperature rise, pollution and above soil & below soil carbon stock.	• **Considering that the quantum of production is less, only 1 excavator, 7 tippers will be engaged. These equipment's will be properly and regularly maintained. Besides, as mentioned earlier, 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 500 number of plants will be planted in and**	**4-3**

		around the lease area. • **Besides, there is no waste generation, disposal or stacking involved in this project. Hence, no adverse impact on this front is envisaged.**	
12	The Environmental Impact Assessment should study impact on protected areas, Reserve Forests, National Parks, Corridors and Wildlife pathways, near project site.	**Kodaikanal Wildlife Sanctuary is located at a distance of 8.2Km from the lease area. As per MoEF&CC Notification S.O412(E)dated 23.01.2020, the Eco sensitive Area is 7.2Km from the lease area. As such the project does not attract NBWL clearance. A map showing the same is provided as Figure No.4.5., Chapter-IV.**	**4-18**
13	The project proponent shall study and furnish the impact of project on plantations in adjoing patta lands, Horticulture, Agriculture and livestock.	**Due to poor soil condition and non-availability of perrineal water source, no major agricultural activity is carried out in and around the lease area. Only patches of plantation are observed in few places in the monsoon season based on water availability**	**4-19**
14	The project proponent shall study and furnish the details on potential fragmentation impact of natural environment, by the activities.	**In the post mining stage, entire 2.76 Ha of mined out area will be left as water body, 0.02 Ha will be the mine roads, 0.01Ha will be infrastructure, 0.30 Ha Ha will be covered with vegetation and 0.50Ha will be left undisturbed.**	**4-20**
15	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 survey of the study area was conducted with reference to listing of species and assessment of the existing baseline ecological conditions. Details are provided under section 3.5.1, Chapter-III.** • **The land use pattern details are provided under section 4.5.1, Chapter-IV.** • **Greenbelt / Plantation will be carried out to enhance the vegetative growth and aesthetic in the safety zone area. About 500 trees will be planted in and around the lease area.**	**3-35** **4-20**

16	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.	**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.**	**4-25**
17	The project proponent shall detailed study on impact of mining on Reserve forests free ranging wildlife.	**Replied in Additional ToR pt. 7.**	**--**

C. Standard ToR			
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.	**This is a proposed project. No mining has been carried out in this lease area so far by the proponent.**	**2-12**
2	A copy of the document in support of the fact that the Proponent is the rightful lessee of the mine should be given	**Precise Area Communication letter received from the Assistant Director, Dep. of Geology & Mining, Dindigul Vide Rc.No:897/2019 (Mines), dated 19.02.2021. (Annexure-1)**	**A-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.	**The production capacity, quantity of waste, its management and mining technology in mine plan and EIA, etc., are compatible with one another.**	**--**
4	All corner coordinates of the mine lease area, superimposed on a High Resolution Imagery/ toposheet, topographic sheet, geomorphology and geology of the area should be provided. Such an Imagery of the proposed area should clearly show the land use and other ecological features of the study area (core	• **Project coordinates superimposed in satellite imagery and given as Figure No - 2.4 in Chapter – II.** • **The geology and geomorphology map is provided in Figure No.3.19, 3.20, Chapter-III. The Lithology map and Soil map are**	**2-6** **3-45 TO**

	and buffer zone).	**provided under Figure No. 3.21, 3.22, Chapter-III.** **The 10km Radius Index plan showing buffer zone is given in Figure No.3.1 in Chapter – III.**	**3-48** **3-2**
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.	**Replied in Standard ToR point no.4**	**--**
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.	**Not Applicable**	**--**
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 proponent will frame a well-planned environmental policy. Its details are provided under Section 10.2.1, Chapter-X.** • **The Mines Manager will undertake effective monitoring and implementation of various environmental control measures promptly and effectively and to oversee various environmental management schemes for air quality control, water quality status, noise level control, plantation programme, social development schemes, etc in the mine. The organizational chart for the same has been provided in Figure No.10.1, Chapter-X.**	**10-1** **10-3**
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	**Various risks likely to arise due to mining activities are detailed under section 7.4, Chapter-VII. This being an opencast mine, subsidence is not applicable. The impact**	**7-4**

	case should also be provided.	**due to ground vibrations due to blasting is given in para 4.3.2, Chapter-IV.**	**4-9**
9	The study area will comprise of 10 km zone around the mine lease from lease periphery and the data contained in the EIA such as waste generation etc. should be for the life of the mine / lease period.	**The study area chosen for collecting existing environmental status covers 10 km radial distance from the project periphery (Figure No - 3.1). Data given in the report is for the life of the mine.**	**3-2**
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 3.4, Chapter-III.** • **The land use pattern at present and at the end of the quarrying period has been provided under section 4.5, Chapter-IV.** • **In the post mining stage, entire 2.76 Ha of mined out area will be left as water body, 0.02 Ha will be the mine roads, 0.01Ha will be infrastructure, 0.30 Ha Ha will be covered with vegetation and 0.50Ha will be left undisturbed.**	**3-30** **4-17**
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 generation anticipated in this quarry operation since the entire excavated material will be utilized. Hence, there is no external overburden dump involved. Besides, there is no proposal for overburden dump outside the lease area.**	**2-12**
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.	**There is no forest land in the lease 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.	**There is no forest land in the lease 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**	**--**
15	The vegetation in the RF / PF areas in the study area, with necessary details, should be given.	**There is no forest land in the lease area.**	**--**
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.	**Kodaikanal Wildlife Sanctuary is located at a distance of 8.2Km from the lease area. As per MoEF&CC Notification S.O412(E)dated 23.01.2020, the Eco sensitive Area is 7.2Km from the lease area. As such the project does not attract NBWL clearance. A map showing the same is provided as Figure No.4.5, Chapter-IV.**	**4-18**
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.	**Replied in Standard ToR point No.16**	**--**
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	**A detailed study of flora and fauna composition in the core and buffer zone of the project has been made through primary field surveys. The details are furnished in para 3.5, Chapter III.**	**3-35**

	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.	**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 sectoml programmes of line	**The mining activities will be carried out within the mine lease area only. The entire mine lease area is a patta land in proponent's possession. There is no population within the ML area. Hence, the question of R& R does not arise.**	**7-4**

	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.		
22	One season (non-monsoon) (i.e. March-May (Summer Season); October-December (post monsoon season) ; December-February (winter season) primary baseline data on ambient air quality as per CPCB Notification of 2009, water quality,: noise level, soil and flora and fauna shall be collected and the AAQ and other data so compiled presented date-wise in the EIA and EMP Report. Site-specific meteorological data should also be collected. The location of the monitoring stations should be such as to represent whole of the study area and justified keeping in view the pre-dominant downwind direction and location of sensitive receptors. There should be at least one monitoring station within 500 m of the mine lease in the pre-dominant downwind direction. The mineralogical composition of PM10, particularly for free silica, should be given.	• **The baseline data on micro- meteorology, ambient air quality, Water quality, noise level, soil and flora & fauna are collected during Summer Season (March 2022 to May 2022) and detailed in para 3.3 to 3.5 of Chapter-III.** • **Monitoring stations were selected taking into account, wind direction and location of sensitive receptors.** **Free silica composition in PM10 sample has been done and the values are found to be Below Detectable Limit (DL 0.05mg/m3) which is well within the prescribed limit of 5mg/m3.**	**3-12 & 3-35**
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 modeling details are furnished in para 4.2.2 and its continuous sub paras in Chapter-IV of EIA report.** • **The impact on air quality due to the proposed project is estimated using AERMOD View Gaussian Plume Air Dispersion Model developed by Lakes Environmental Software which is based on steady state Gaussian plume dispersion.** • **The model simulations are done for the air pollutant arising from the mining operations, namely, PM10, PM2.5. Ground**	**4-3**

		Level Concentration (GLC) have been computed using hourly meteorological data. • **The Isopleths of PM10, PM2.5 concentrations for with control measures scenario have also been drawn and these are given in Figure No.4.1 and 4.2.** • **It can be seen that the resultant added concentrations with baseline figures even at worst scenario, show that the values of ambient air quality with respect to PM10 are in the range of 51.9 μg/m3 to 67.3 μg/m3 and with respect to PM2.5 are in the range of 25.4 μg/m3 to 40.6 μg/m3 which are within the statutory limits in each case.**	**4-6 & 4-7**
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 total water requirement for this project will be 10.0 KLD comprising 1.0 KLD for drinking water and domestic use, 8.0 KLD for dust suppression and 1.0 KLD for greenbelt. The water will be sourced initially 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 No 4.3.**	**4-9**
25	Necessary clearance from the Competent Authority for drawl of requisite quantity of water for the Project should be provided.	**Not Applicable.**	**--**
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.	• **The rain water falling in the quarry will be harvested in the sump at the lowest level of the quarry. This sump will act as a settling pond to prevent solids escaping along with discharge, before outlet. etc.**	**4-10**

		• **Towards surface runoff management, a garland drain of length 800m will be constructed around the quarry and will be connected to a settling pond with silt traps. The supernatant clear water from the settling pond will be flow to the downstream users. The surface runoff management structures diagram is given in Figure No 4.4, Chapter-IV.** • **The methods for reducing water consumption and rainwater harvesting is provided in section 4.3.4, Chapter-IV.**	
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.	• **There is a drainage channel passing on the south eastern side of the lease area at a distance of 55m from the lease area. There is also an odai at a distance of 350m on the south eastern side. There is no proposal to discharge any effluent into this water body. No major impact is envisaged on the nearby water bodies due to project operations.** • **The ultimate pit depth of mining is 48m. The ground water table in this area is below this level. Hence, ground water intersection in not envisaged and ground water will not be affected appreciably due to the quarrying operation.**	**4-11**
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	• **The occurrence of groundwater mainly in the porous soil are weathered layers, very negligible amount of groundwater percolated through the poorly fractured layer, after that there is no existence of groundwater. Since the mining area**	**3-44**

	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.	**consists of hard compact rock, no major water seepage within the mine is expected from the periphery.** • **The ultimate pit depth of mining is 48m. The ground water table in this area is below this level. Hence, ground water intersection in not envisaged and ground water will not be affected appreciably due to the quarrying operation.** • **Details of hydro geological study are given in Para 3.6, Chapter – III.**	
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.	**Replied above in Standard ToR point No.27.**	**--**
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 quarry lease exhibits almost plain topography covered by Topsoil formation. The massive Charnockite formation is noticed below 2m (Avg) Topsoil and 1m Weathered rock formation and sloping towards South eastern side of the area, the altitude of the area is above 338m (maximum) from MSL** • **The ultimate pit depth of mining is 48m. The ground water table in this area is below this level.**	**2-2** **2-14**
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. Phasc-wise plan of plantation and compensatory afforestation should be charted clearly	**In the lease area, safety barrier 7.5m around the periphery, 50m safety distance for the c power line in the eastern ide of the lease area. Greenbelt / Plantation will be carried out to enhance the vegetative growth and aesthetic in the safety zone area. About 500 trees will be planted in and around the lease**	**4-20**

	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.	**area. About 500 trees will be planted in and around the lease area. Details of the same is provided under Table No.4.16, Chapter-IV.**	
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.	**From this proposed quarry the entire output will be transported to the crusher units for producing stone aggregates of different sizes or construction of roads, bridges, buildings and other buyers etc. Details of the traffic study is provided under section 4.9, Chapter-IV.**	**4-24**
33	Details of the onsite shelter and facilities to be provided to the mine workers should be included in the EIA Report.	**This is a proposed project. Site services like mine office, first aid room, rest shelters, toilets etc. will be provided as semi-permanent structures.**	**2-17**
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.	**In the post mining stage, entire 2.760 Ha of mined out area will be left as water body, 0.01 Ha will be the infrastructure, 0.02Ha will be road, 0.30 Ha will be covered with vegetation and 0.50Ha will be left as undisturbed area. The post mining land use plan showing afforestation and water body is shown in Figure No- 4.4.**	**4-20**
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	**Details of occupational health and safety aspects are given under the subsections of Para 4.8, Chapter-IV.**	**4-22**

	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	• **Details of the socio economic survey conducted in the buffer zone has been provided in Para 3.2.4, Chapter-III.** • **Public health facilities will be further aimed to be developed through CER activities wherein periodic health checkups, medical camps for the locals will be conducted.**	**3-9**
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.	• **Towards the socio-economic development of the surrounding area, the proponent has earmarked an amount of Rs.5 Lakhs under Corporate Environmental Responsibility. The activities identified under CER will be implemented in a phased manner in the nearby Government schools. In consultation with the locals based on the need & priority it will be implemented. Its details are provided in Para 4.7, Chapter-IV**	**4-22**
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.	• **Detailed Environmental Management plan and its implementation, etc., are furnished in Chapter X.**	**10-1**
39	Public Hearing points raised and commitment of the Project Proponent on the same along with time bound Action Plan with budgetary provisions to implement the same should be provided and also incorporated in the final EIA/EMP Report of the Project.	• **This draft EIA/EMP report will be exposed to public consultation as per mandatory procedures through the District Collector and State Pollution Control Board officials after giving 30 days advance notice in two**	**7-1**

		local newspapers about the scheduled date and time for conduct of the public hearing procedures. • **The opinions, concerns and objections of stakeholders will be recorded during the public hearing. All the public queries and the replies to the query by the project proponent and officials concerned will be recorded and incorporated in the EIA/EMP report for approval by SEIAA, Tamil Nadu.**	
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.	• **The cost of the project is Rs.94,11,000/-** • **Towards EMP measures, Rs.13.9 Lakhs is allocated under capital cost. Besides, Rs.13.55 lakhs per annum will be spent under recurring cost. All the recurring cost of maintenance of pollution control measures, environmental monitoring etc., will be met from revenue.**	**4-22** **10-9**
42	A Disaster management Plan shall be prepared and included in the EIA/EMP Report.	**The disaster management plan has been provided under section 7.3.1, Chapter-VII.**	**7-2**
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.	• **The proposed Rough Stone Quarry will benefit this region in the fields of employment opportunities, improved per capita income for local people, improved social welfare facilities in respect of education, health, infrastructural etc.** • **Direct employment to 18 people and indirect employment to scores of people.**	**8-1**

		• By means of carrying out the socio economic development activities, local community development is expected. Towards the same, the proponent has planned to allocate Rs. 5 Lakhs for various activities under CER. From the CER activities allocated for various social welfare activities, the villages near the lease area will be benefited.	

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CHAPTER - I

INTRODUCTION

CHAPTER 1
INTRODUCTION

1.1 PURPOSE OF THE REPORT:

Tvl.T & P Aggregates Private Limited proposes to operate a **Rough Stone and Jelly Quarry** Survey No.225/2A over an extent of 3.59.0Ha in Chinnakalayamputhur village, Palani Taluk, Dindigul District, Tamil Nadu, and has initiated action towards obtaining environmental clearance for the same. Entire lease area is own patta land.

Although the individual lease area of this project is less than 5 Ha, the other existing quarries within the 500m radius cluster along with this subject project works out to >5 Ha. Hence, this proposal is considered under Category – B1 and as per MoEF & CC notification necessitates preparation of EIA/EMP report and public hearing.

This EIA/EMP report is prepared based on standard and additional Terms of Reference issued by SEIAA, Tamil Nadu vide letter no. SEIAA-TN/F.No.8833/ToR-1108/2021 dated 21.03.2022 and is in conformance of the generic structure prescribed by MOEF&CC in their notification of September 2006 and the approved mining plan.

This draft EIA/EMP report will be submitted for public hearing as per rules and procedures in this respect, as per the EIA notification 2006. The opinions, concerns and objections, if any, of the surrounding public and other stake holders connected, will be taken into consideration and compliance report thereon will be submitted to SEIAA, Tamil Nadu in the final EIA/EMP report.

1.2 IDENTIFICATION OF PROJECT & PROJECT PROPONENT:

1.2.1 IDENTIFICATION OF PROJECT:

The proposed production for 10 years period is 6,36,690m^3 of Rough stone, 26,520m^3 of Weathered Rock and 55,212m^3 of Topsoil for the depth of 48m. During the first five years, it is proposed to mine 4,00,510m^3 of Rough stone, 26,520m^3 of Weathered Rock and 55,212 of Topsoil up to a depth of 23m. **The impact assessment and management plan is studied for the peak production of the mine lease period and the entire area of quarry operation and can be construed as applicable for the entire lease period**. The overburden in the form top soil of utilized for formation of boundary barrier,afforestation purpose and shall be disposed to needy buyers after paying necessary fees to the government. The rough stone, weathered rock

will be excavated and loaded into tipper to the needy crusher/other buyers for producing crusher aggregates, M Sand.

Statutory Approvals:

- Precise Area Communication letter received from the Assistant Director, Dep. of Geology & Mining, Dindigul Vide Rc.No:897/2019 (Mines), dated 19.02.2021. **(Annexure-1)**
- Mine plan for this project was approved by Assistant Director, Dep. of Geology & Mining, Dindigul vide Rc.No:897/2019 (Mines), dated 10.05.2021. (**Annexure-2).**

As mentioned in the precise area letter, 50m safety distance is maintained for the EB line passing on the eastern side of the lease area and no disturbance will be caused to the structures nearby during mining operation.

1.2.2 IDENTIFICATION OF PROJECT PROPONENT:

Proponent Name	:	Tvl.T & P Aggregates Private Limited
Address	:	Chinnakalayamputhur Village, Palani Taluk, Dindigul District-624601.
Contact Number	:	9400240133
Email-ID	:	tandpaggregate@gmail.com

The proponent is financially sound to meet the monetary requirements of this project and will ensure that the mining operations are carried out as per statutory requirements.

1.3 BRIEF DESCRIPTION OF NATURE, SIZE, LOCATION & PROJECT IMPORTANCE

1.3.1 NATURE, SIZE AND LOCATION OF THE PROJECT:

The details of the nature and size of the Rough stone and Jelly Quarry of Tvl.T&P Aggregates Private Limited has been detailed below in Table No.1.1.

Table 1.1: Brief Description of Nature of project

1.	**Sector**	1(a), Non-Coal Mining
2.	**Type**	Fresh Project
3.	**Category**	B1 (Cluster Situation)
4.	**Mineral Mined**	Rough stone and Jelly
5.	**Major/Minor Mineral**	Minor

Location of the Project:

This is a Roughstone and Jelly Quarry located in Chinnakalayamputhur village, Palani Taluk, Dindigul District, Tamil Nadu. There is an existing road from the area leads to North Thathanaickenpatty – Chinnakalayamputhur village road on Northern side of the area. The Nearest Railway line is Dindigul – Pollachi line which is about 3.0Km on Northern side of the area. The National Highway (NH-83) Dindigul – Coimbatore is about 1.5Km on Northeastern side of the area. The State Highway (SH-192) Madathukulam – Thalaiyuthu is about 6.0Km on Northern side of the area. Its details are elaborated in Para **2.3, Chapter-II.**

Table 1.2: Location of the project

S.No	Particulars	Details
1.	Corner Coordinates	**Latitude:** 10°28'03.98"N to 10°28'08.83"N **Longitude:** 77°26'41.59"E to 77°26'52.83"E
2.	Toposheet Number	58 F /6,7,10 &11
3.	Extent	3.59.0Ha
4.	Survey Nos.	225/2A

1.3.2 IMPORTANCE TO THE COUNTRY AND REGION:

Rough stone and Jelly from this quarry will meet the domestic demand. The production and method of mining is planned considering the geological factors, availability of proven technology, demand for the material etc. Safety barriers as per State Government order is left in the planning stage itself. Systematic and scientific mining will be carried out. This project will give employment opportunities to 24 people. The proponent will carry out CER activities in which will help the surrounding villages to derive socio economic benefits. The activities will be customized based on local needs and prioritized. Hence, livelihood development and employment will arise due to this project.

1.4 SCOPE OF THE STUDY:

ToR for this project has been received from SEIAA, Tamil Nadu vide their letter No. SEIAA-TN/F.No.8833/ToR-1108/2021 dated 21.03.2022. The point wise compliance for the ToR has been incorporated in this EIA/EMP report. Baseline environmental data for the project has been

undertaken by Creative Engineers & Consultants for March – May 2022 (Summer Season) Based on the terms of reference, the Environmental Impact Assessment was carried out for the project area (core zone and the buffer zone (10km radius from the periphery core zone) and the following studies were covered:

- Collection of primary and secondary data relevant to the project.
- One-Season baseline monitoring for environmental parameters such as air, water, noise, soil, flora & fauna, etc. Analysis of parameters in in-house laboratory.
- Documentation of EIA/EMP report with inclusion of relevant studies conducted by other bodies into the EIA/EMP report.
- Identification of significant environmental parameters that are prone to get affected due to pollution. Namely, Air, Water, Noise, Soil, Biological and Land Environment.
- Evaluation and determination of suitable mitigation measures to reduce and control the said pollution.
- Prediction of post project concentration (baseline + incremental) with respect to air environment for core zone and buffer zone.
- Formulation of an Environmental Management plan including administrative aspects for proposed implementation of mitigative measures in time.

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CHAPTER - II

PROJECT DESCRIPTION

CHAPTER 2

PROJECT DESCRIPTION

2.1 TYPE OF PROJECT:

Rough Stone and Jelly Quarry of Tvl.T & P Aggregates Private Limited over an extent of 3.59.0Ha in Chinnakalayamputhur village, Palani Taluk, Dindigul District, Tamil Nadu involves the production of 6,36,690m^3 of Rough stone, 26,520m^3 of Weathered Rock and 55,212m^3 of top soil for the depth of 48m for 10 years lease period. During the first five years, it is proposed to mine 4,00,510m^3 of Rough stone, 26,520m^3 of Weathered Rock and 55,212m^3 of top soil up to a depth of 23m.

2.2 NEED & JUSTIFICATION FOR THE PROJECT:

A) Availability of good quality proved reserves:

Presence of exposed rocks in the nearby mined out area has proved the availability the material in the lease area. Geological reserves are estimated to be 16,12,620m^3 of Roughstone, 35,836m^3 of weathered rock and 71,672m^3 of top soil.

B) Techno economic viability of the scheme:

Mechanized opencast method of mining which is to be used in this project is a proven technology in our country. With good market demand it is economically viable. Under the above circumstances it can be concluded that techno economically this scheme is feasible.

C) Better approachability to the project and availability of logistic facility in proximity to the site.

There is an existing road from the area leads to North Thathanaickenpatty – Chinnakalayamputhur village road on Northern side of the area. The Nearest Railway line is Dindigul – Pollachi line which is about 3.0Km on Northern side of the area. The National Highway (NH-209) Dindigul – Coimbatore is about 1.5Km on Northeastern side of the area. The State Highway (SH-192) Madathukulam – Thalaiyuthu is about 6.0Km on Northern side of the area.

D) Economic and Socio Economic Benefits:

- Meeting the construction material demand of the area.

- Enhanced revenue to Government by way of Royalty, etc.,
- Socio economic benefit to the locals due to CER activities

Considering all the above said favorable factors it is practically possible to achieve the proposal within the planned period and this proposal is fully justified.

2.3 LOCATION:

A brief description of the mining area, along with the location, coordinates, accessibility, etc. has been details below in **Table No.2.1 & Figure No.2.1.** The details of connectivity is elaborated under section 2.2C, Chapter-II. The existing road from the quarry area will be used and maintained for transportation. The approachability map is provided in **Figure No.2.2.** Corner co-ordinates of the project area boundary in map and satellite imagery are shown in **Figure No. 2.3 & 2.4** respectively.

Table 2.1: Mine site description

Location	Chinnakalayamputhur village, Palani Taluk, Dindigul District.
Survey No.	225/2A
Coordinates	**Latitude:** 10°28'03.98"N to 10°28'08.83"N **Longitude:** 77°26'41.59"E to 77°26'52.83"E
Nearest Village	Kasanayampatty – 1.0km (NW)
Nearest Town	Palani – 7.0km (SE)
Nearest Railway Station	Palani – 7.0km (SE)
Nearest Airport	Coimbatore – 76.0km – (NW)
Topography	The area applied for quarry lease exhibits almost plain topography covered by Topsoil formation. The massive Charnockite formation is noticed below 2m (Avg) Topsoil and 1m Weathered rock formation and sloping towards South eastern side of the area, the altitude of the area is above 338m (maximum) from MSL
Drainage	The drainage map of the lease area is provided in Figure No.3.16. It shows that the drainage pattern is dendritic in nature. Drainage channel originates 55m (SE), Odai 350m(SE) side.

Figure 2.1: Location Map

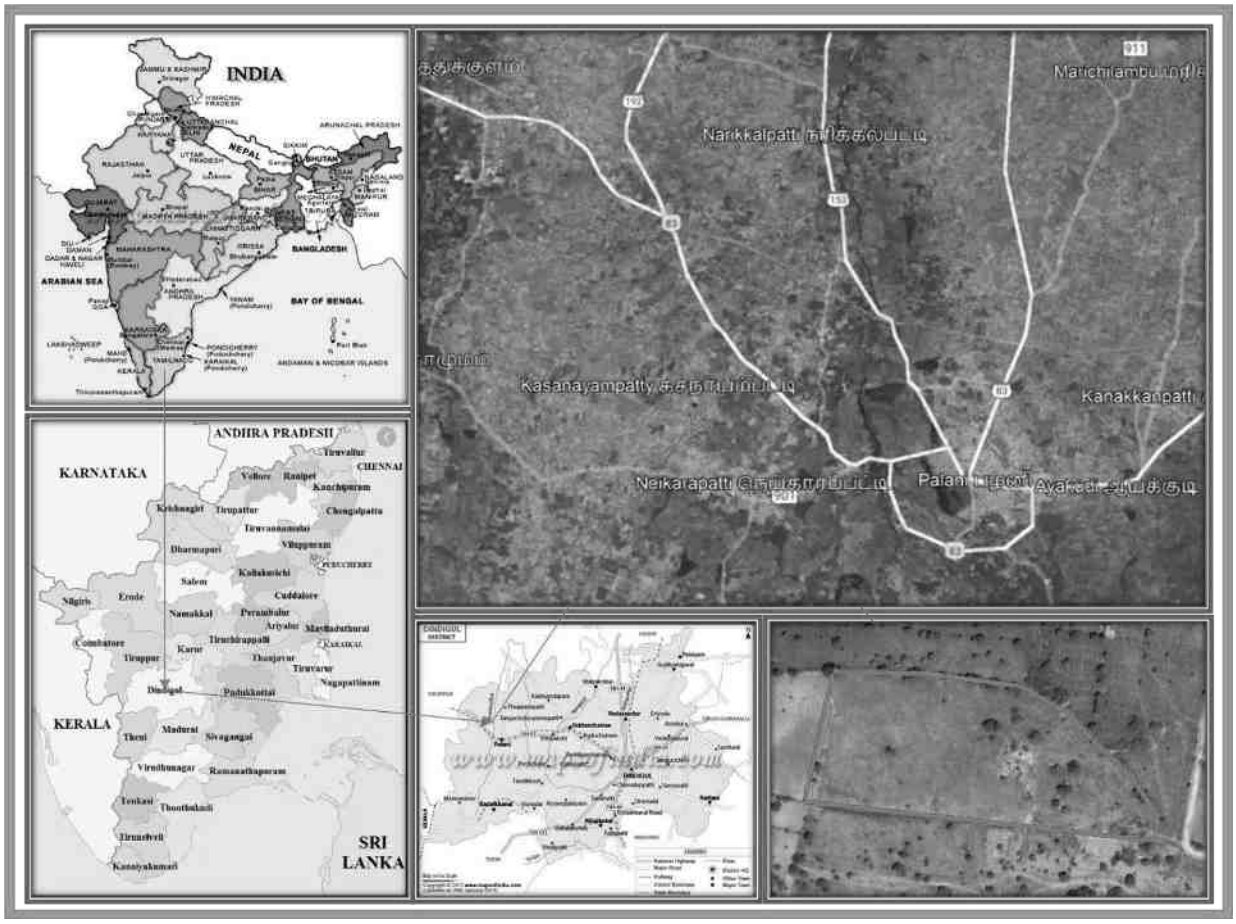


Figure 2.2: Approachability Map

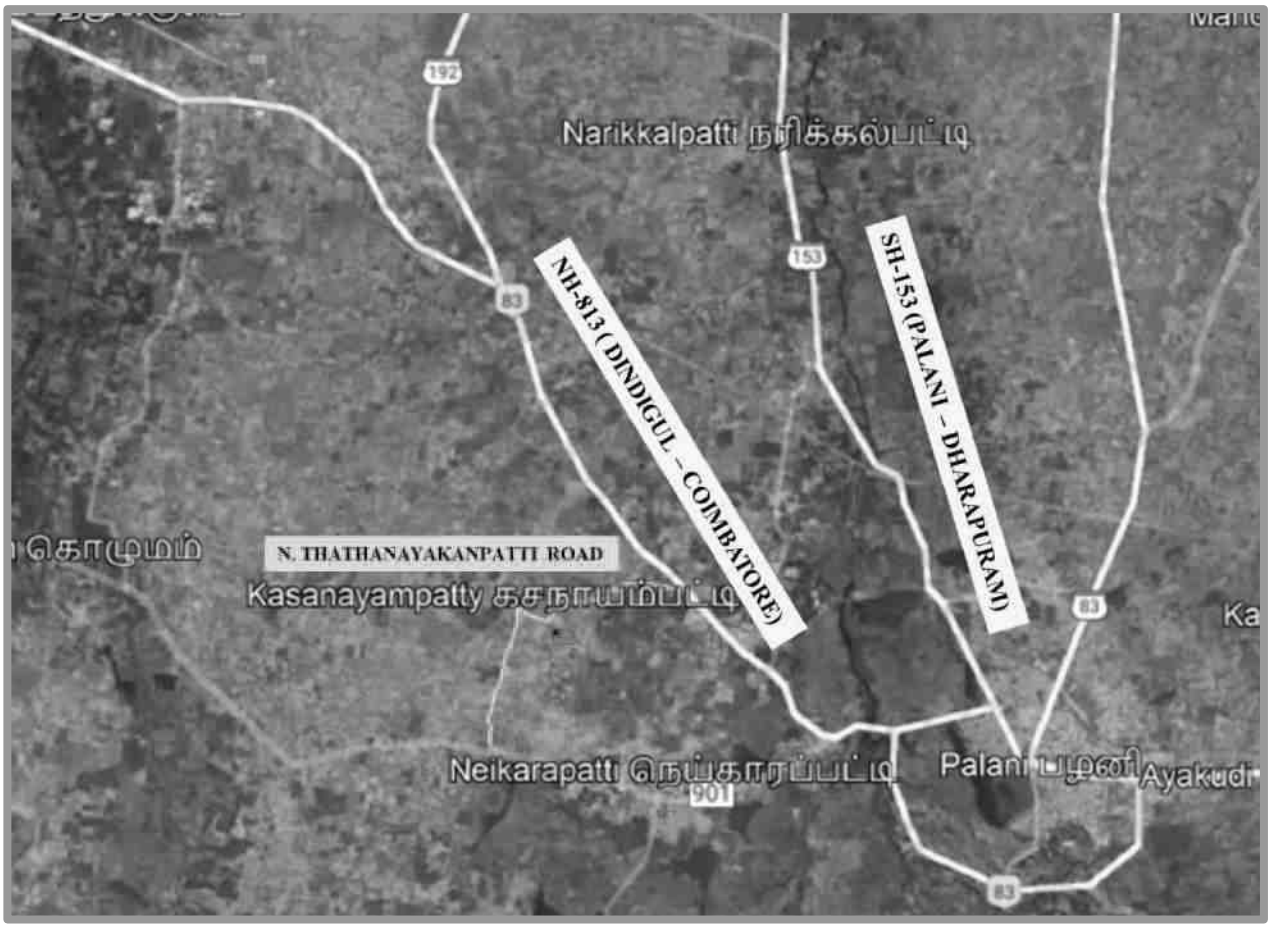


Figure 2.3: Lease Plan

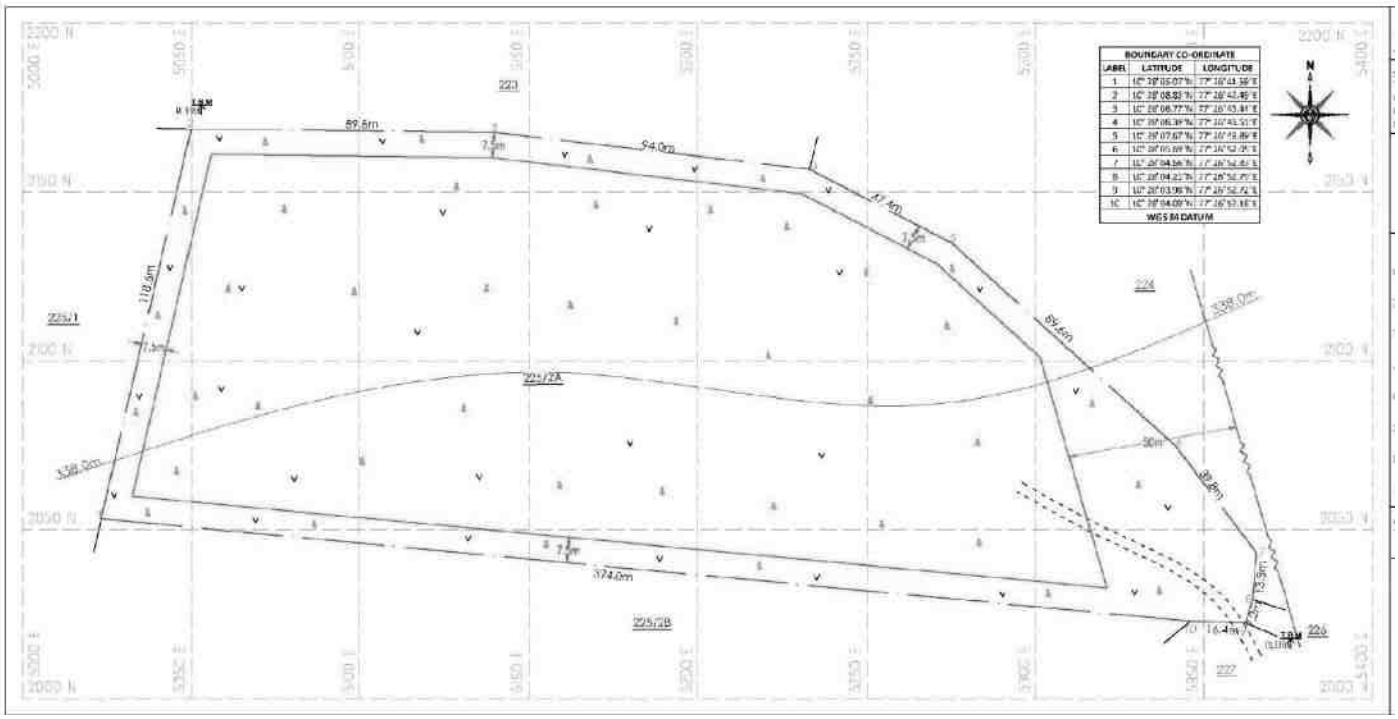
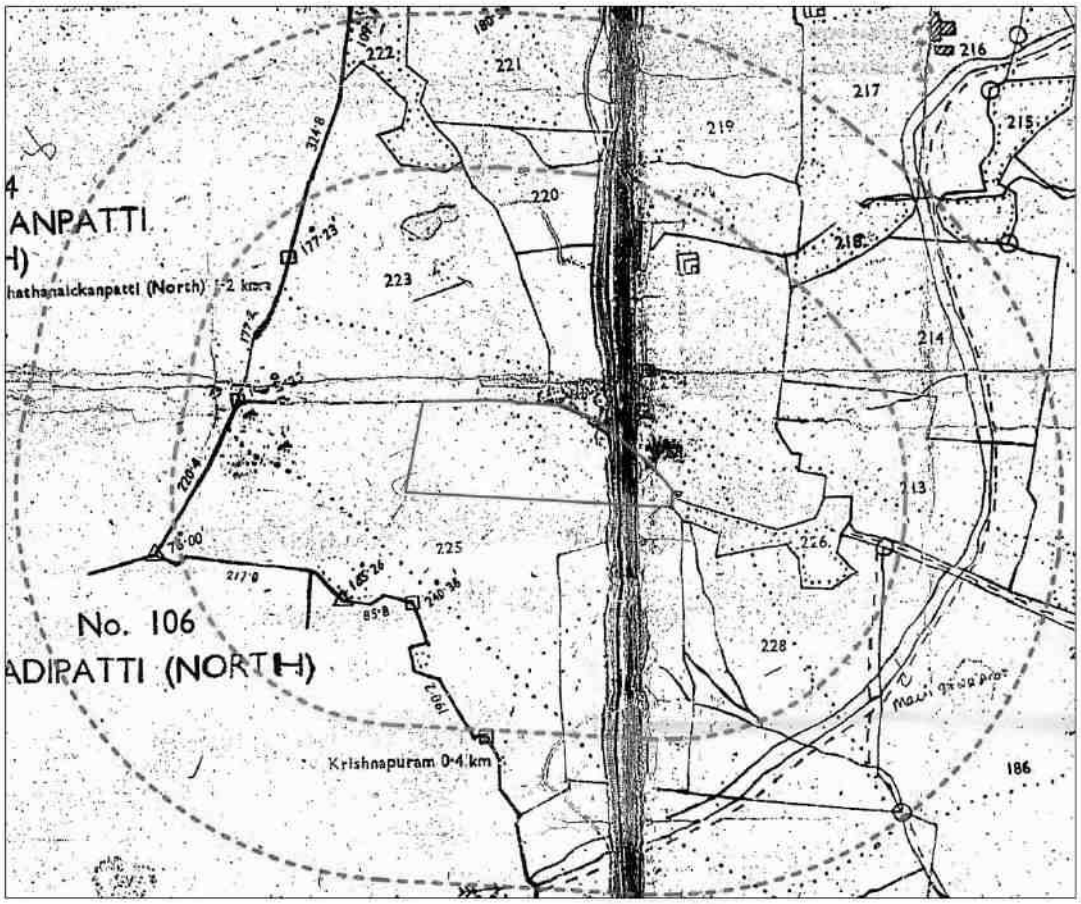


Figure 2.4 : Satellite Imagery Showing Corner Co-ordinates of the Project Area

SITE PHOTOGRAPH

Figure 2.5: Village Map



2.3.1 LAND USE:

This lease area in S.F.No.225/2A over an extent of 3.59.0Ha is a patta land registered in the name of the applicant vide patta No – 1822 (**Refer Annexure No – 3)**

2.3.2 GEOLOGY:

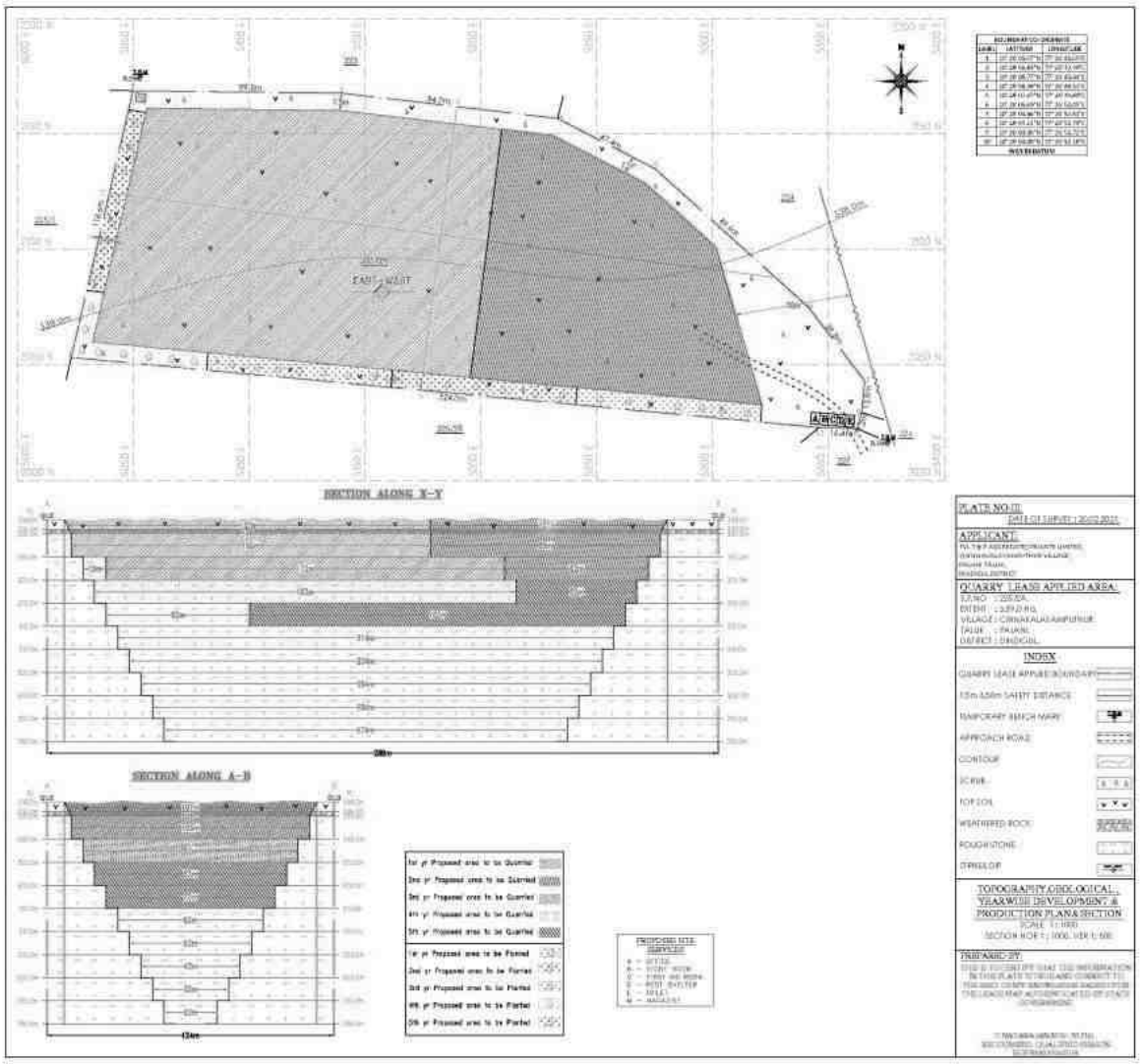
The area is underlain by the wide range of metamorphic rocks of peninsular gneissic complex. These rocks are extensively weathered and overlain by the recent valley fills and alluvium at places. The geological formations found in the district are Archaean rocks like Gneisses, Granites, Charnockites basic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

Table 2.2: General Geological Succession of the Area

	Age	Rock Formation
1	Recent to Sub recent	Quaternary weathered Rock Formation
2	Archaean	Charnockite, Khondalites
3	Archaean	Peninsular Gneiss, and Calc Gneiss

Figure 2.6: Geological Plan and Cross Section



2.4 SIZE AND MAGNITUDE OF THE OPERATION:

As already mentioned, the project pertains to production of 6,36,690m^3 of Rough stone, 26,520m^3 of Weathered Rock and 55,212m^3 of topsoil for the period of ten years. The Proposed Production for the first five years is 4,00,510m^3 of Rough stone, 26,520m^3 of Weathered Rock and 55,212m^3 of topsoil. The details covered under this section can be summarized as follows:

- Total Mineral resources in the lease area is 16,12,620 m^3 of Rough stone, 35,836 m^3 of Weathered Rock and 71,672m^3 of top soil
- The mining will be done by open cast semi mechanized mining method.
- Life of mine will be 10 years.
- During the plan period of 5 years, 4,00,510m^3 of Rough stone, 26,520m^3 of Weathered Rock and 55,212m^3 of top soil upto a depth of 23m bgl.
- There is no waste generation anticipated in this quarry operation since the entire excavated material will be utilized / transported to buyers.

2.4.1 RESERVES:

The quarrying depth has been restricted from mine plan approved depth of 23m for 5 years and total of 48m for 10 years.

Table 2.3: Geological and Mineable Reserves

S. No	Type of reserves	Roughstone (m3)	Weathered Rock (m3)	Top Soil (m3)
1	Geological Resources	16,12,620	35,836	71,672
2	Mineable reserves up to 48m	6,36,690	26,520	55,212
3	Mineable reserves up to 23m	4,00,510	26,520	55,212

2.4.2 MINING METHOD:

Opencast semi mechanized mining using jackhammer drilling, blasting, excavation through excavator & mineral transport through tippers will be carried out. The overburden in the form top soil will be utilized for formation of boundary barrier, afforestation purpose & disposed outside after paying necessary fees to Governement. The rough stone, weathered rock below will be blasted and then excavated. Bench height of 5.0m & 5.0m width is considered.

Table 2.4: Details Of Equipment's

S. NO	NAME OF THE EQUIPMENT	CAPACITY	REQUIREMENT
1	Excavator with Rock breaker attachment	0.90m3 bucket capacity	1
2	Tipper	5/10 tonnes	4
3	Tractor mounted compressor with jack hammer	30-32mm dia	1

2.5 PROPOSED SCHEDULE FOR APPROVAL AND IMPLEMENTATION:

The proponent propose to implement the production immediately after obtaining all the statutory approvals such as CTE, CTO, etc. The proponent will comply with the environmental clearance conditions during mining operations. The schedule of project implementation envisaged for this project is provided below. This is a tentative schedule subject to various factor, hence unforeseen variations may occour.

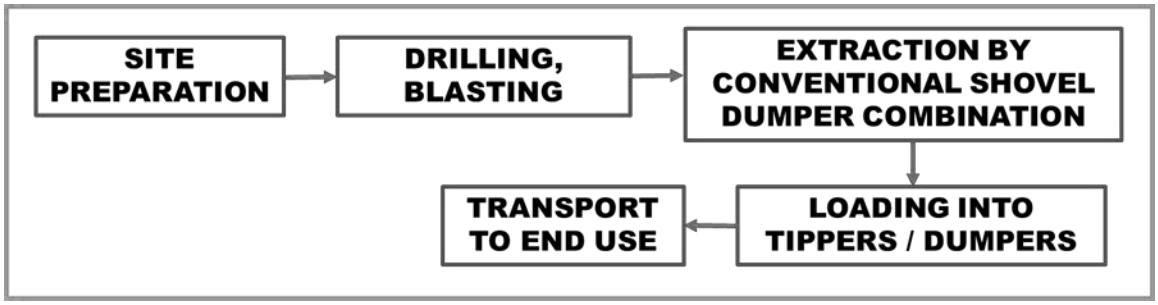
Table 2.5 : Proposed Schedule of Implementation

Activities	Months					
	Zero Date	1	2	3	4	5
Obtaining Environmental Clearance						
Obtaining Consent from State Pollution Control Board						
Lease Execution						
Equipment mobilization and Commencement of Mining activity after following all the Statutory Requirements						

2.6 TECHNOLOGY AND PROCESS DESCRIPTION:

The quarry operations involve shallow jack hammer drilling, blasting, excavation, loading and transportation of material to needy buyers. The production of Roughstone in this quarry involves jackhammer drilling and blasting. The primary boulders 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. The process flow diagram of this project is provided below.

Figure 2.7: Process Flow Diagram



2.7 PROJECT DESCRIPTION:

2.7.1 PAST PRODUCTION:

This is a proposed project. No mining has been carried out in this lease area so far by the proponent.

2.7.2 PLAN PERIOD-PRODUCTION & WASTE DISPOSAL:

During the plan period, it is proposed to quarry out 4,00,510m3 of Rough stone, 26,520m3 of Weathered Rock and 55,212m3 of topsoil up to a depth of 23m from the lease area during the first five years and the balance 2,36,180m3 of Roughstone during the balance five years. The year wise production details are provided below.

Table 2.6: Production Schedule During Plan Period

YEAR	Roughstone (m3)	Weathered Rock m^3	Topsoil (m3)
I	79825	16224	33598
II	79815	10296	21614
III	79980	--	--
IV	80180		-
V	80710		-
Sub Total (Year I to V)	**4,00,510**	**26520**	**55212**
Year VI to X	**2,36,180**	**-**	**-**
Total	**6,36,690**	**26,520**	**55,212**

Waste Disposal during Plan Period:

There is no waste generation anticipated in this quarry operation since the entire excavated material will be utilized. The overburden in the form top soil will be utilized for formation of boundary barrier, afforestation purpose and disposed outside after paying necessary fees to Government. The rough stone, weathered rock will be excavated and loaded into tipper to the needy buyers for producing crusher aggregates, M Sand.

Figure 2.8: Yearwise Plan

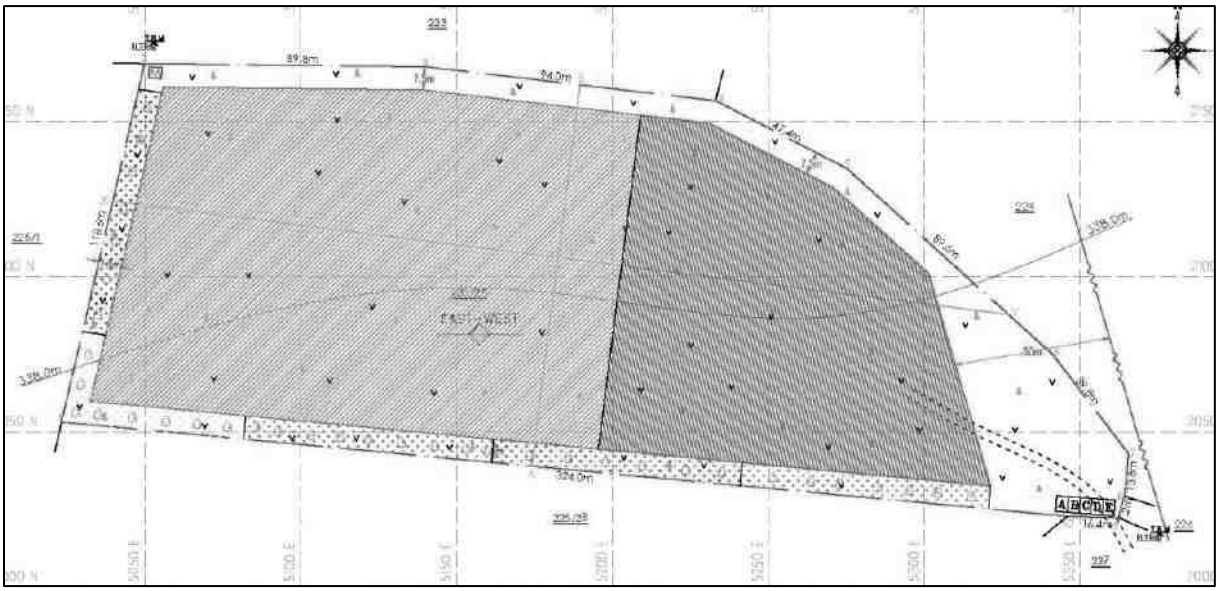
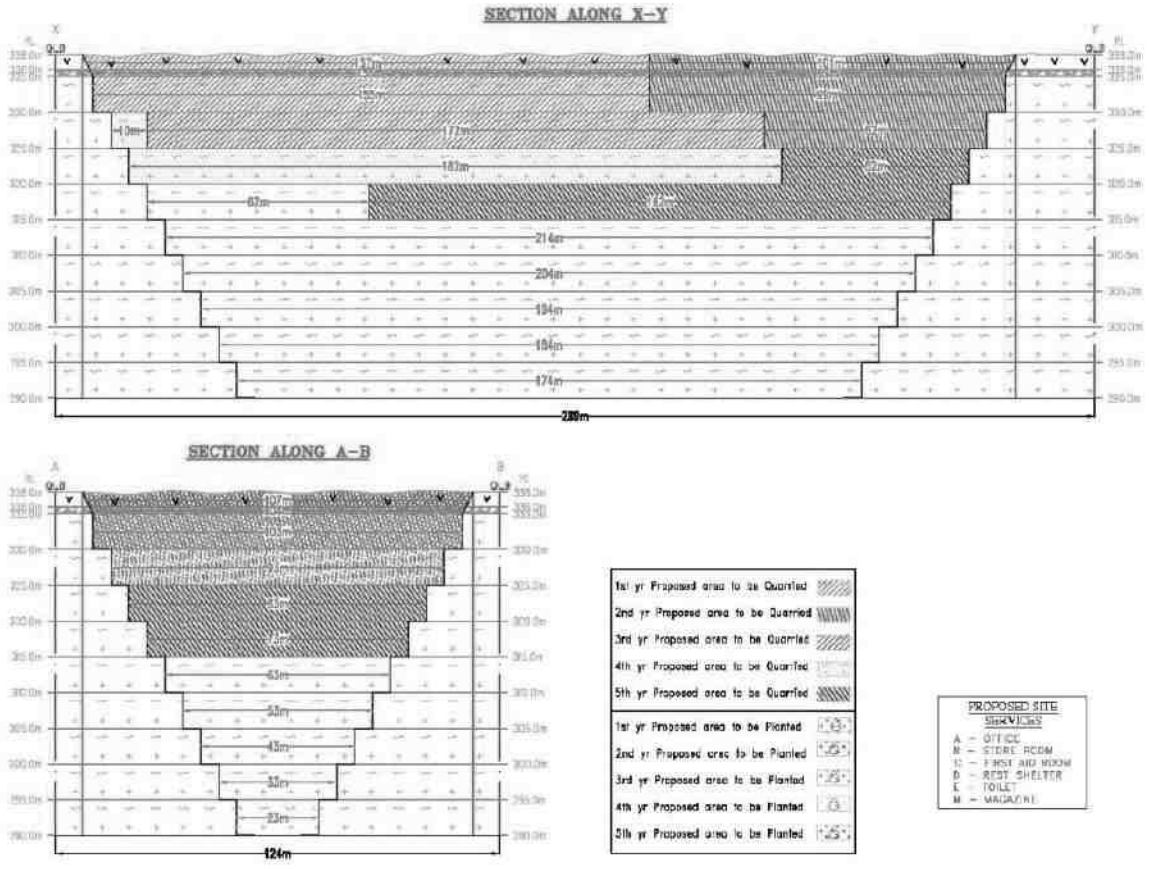


Figure 2.9: Yearwise Cross Section



2.7.3 CONCEPTUAL STAGE:

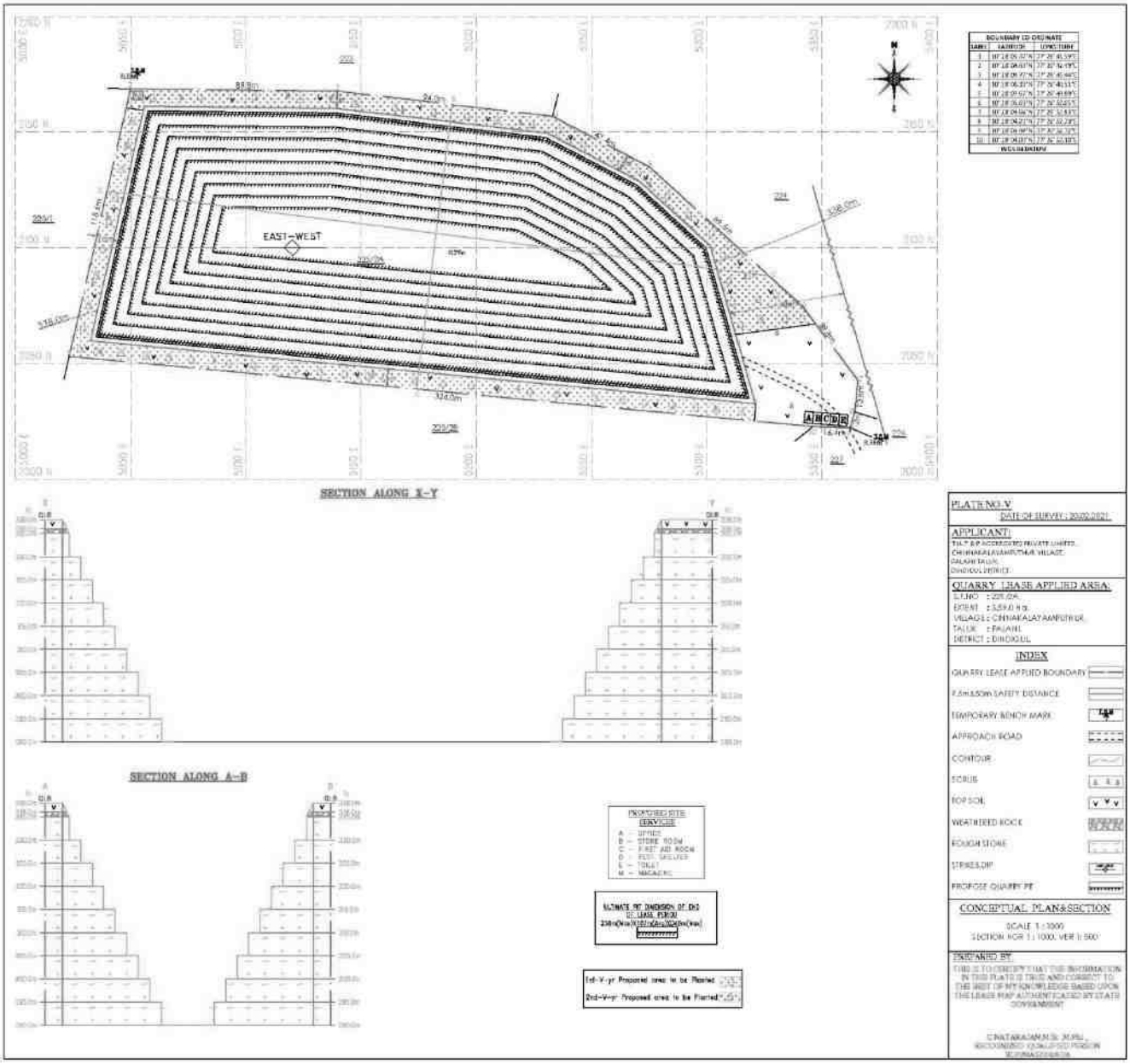
Based on the Terms of Reference, the ultimate depth of mining is restricted to 23 m for the first five years. During the balance five years, the mining depth will be upto 48m. The conceptual pit dimensions is provided below:

Table 2.7: Ultimate Pit Dimensions

Ultimate Pit dimension (m) - End of the 5 year plan period			
Pit No	**Length (max)**	**Width (Avg)**	**Depth (max)**
I	258	107	23m BGL
Ultimate Pit dimension (m) - End of the 10 year plan period			
I	258	107	48m BGL

The ground water table on the surface in this area is ranging from 60m BGL Hence, ground water intersection in not envisaged. The Conceptual Plan & Cross section are shown in **Figure No. 2.10.**

Figure 2.10: Conceptual Plan and Cross Section



2.7.4 LAND DEGRADATION/UTILIZATION:

The land use pattern at present and at the end of the quarrying period has been provided below.

Table 2.8: Land Use

Sl. No.	Land Use	Present Area (Hect)	Area in use during the quarrying period (Hect)
1.	Quarrying Pit	Nil	2.76.0
2.	Infrastructure	Nil	0.01.0
3.	Roads	Nil	0.02.0
4.	Green Belt	Nil	0.30.0
5.	Unutilized	3.59.0	0.50.0
	Total	3.59.0	3.59.0

At the end of the 5 year period 2.76.0Ha will be used as mined out area at 23m below ground level Subsequently, in the remaining 6th to 10th year there will be only depth ward mining in the same mined out area up to 48m below ground level). At the end of the life of the mined out area will be left as water body. 0.02.0Ha will be the mine roads and 0.81.0Ha will be covered with vegetation.

2.7.5 PROJECT REQUIREMENTS:

A. Raw Material:

This project involves the excavation of is 6,36,690m^3 of Rough stone, 26,520m^3 of Weathered Rock and 55,212m^3 of top soil for the depth of 48m for a period of 10 years. During the first five years, it is proposed to mine 4,00,510m^3 of Rough stone, 26,520m^3 of Weathered Rock and 55,212m^3 of top soil up to a depth of 23m.The excavated material will be marketed to needy customers.

B. Water Requirement:

The total water requirement for this project will be 10.0 KLD. The required water will be procured from outside agencies initially. Later, water collected in the mine pit will be used to meet the needs.

Table 2.9: Water Requirement

Details	Quantity (KLD)
Drinking water and Domestic Use	1.0
Dust Suppression	8.0
Green belt	1.0
Total	**10.0**

C. Power Requirement:

All the equipment will be diesel operated. No electricity is needed for mining operation. The minimum power requirement for office, etc will be met from state grid.

D. Manpower Requirement:

The project will provide employment opportunities totally to 24 people people. Priority will be given to locals towards employment.

E. Infrastructure Requirement:

This is a proposed project. Site services like mine office, first aid room, rest shelters, toilets etc. will be provided as semi-permanent structures.

2.8 DESCRIPTION OF MITIGATION MEASURES:

Scientific and systematic development of mines will be carried out by the project authorities for preserving as well as improving the environmental conditions in and around the mining lease area. Elaborate analysis on impacts and mitigation measures to be adopted on implementation of this project and the same has been dealt in Chapter- IV.

2.9 ASSESSMENT OF NEW & UNTESTED TECHNOLOGY:

There is no new technology that is being implemented. Opencast method of mining which is the proposed method of mining is a proven technology which is technologically and economically viable. . No major technological failures are anticipated. A disaster management plan shall be put into place to take care of any unforeseen situation.

2.10 CONCLUSION:

As good environmental preservation is one of the prime motive of the project proponent. It is expected that the project activity will not have any major impact on environmental equilibrium in the study area.

* * * * * * * *

CHAPTER - III

DESCRIPTION OF ENVIRONMENT

CHAPTER 3

DESCRIPTION OF ENVIRONMENT

3.1 GENERAL:

The existing environmental baseline data for the various environmental components were collected in the study area for the purpose of assessing the impact on present environment due to the project activities.

Monitoring was carried out systematically and meticulously as per relevant IS codes, CPCB, MoEF&CC guidelines during **Summer Season (March 2022 to May 2022)** The details of the study are given in this chapter.

For the purposes of this study, the area has been divided into two zones, namely, core and buffer zones. The entire lease area is considered to be the core zone while the buffer zone encompasses a 10km radius from the periphery of the core zone. The details of villages falling in the study area and other features are given in Index Plan in **Figure No - 3.1**

The primary data collection was done by means of field monitoring and the secondary data collection was obtained from published sources and government documents. The details of the baseline data collection which has been elaborated through the course of this chapter has been concised below:

Table 3.1: Type of Baseline Data

S.No	Studies	Parameters / Study	Location
1	Socio Economy	Demographic Data from Census 2011	Core and Buffer Zone
		Sample Survey	Buffer Zone
2	Micro Meteorology	Rainfall Data from IMD, Dindigul	Dindigul District
		Temperature, Humidity, Wind Speed, Wind Direction	1 Representative Location
3	Ambient Air Quality	PM10, PM2.5, SO2, NOx, CO	1 Core Zone, 4 Buffer Zone
4	Water Quality	Physical and Chemical Parameters	1 Core Zone, 3 Buffer Zone
5	Noise Levels	Ambient Noise	1 Core Zone,4 Buffer Zone
6	Soil Quality	Physical and Chemical Parameters	1 Core Zone, 2 Buffer Zone
7	Land Use and Land Cover	Land use pattern within 10km study area using RS Satellite	Buffer Zone
		Land use based on Census 2011	Core and Buffer Zone
8	Biological Environment	Flora and Fauna	Core Zone and Buffer Zone
9	Hydrology & Hydro Geology	Hydrogeological profile of the area	Core Zone and Buffer Zone

Figure 3.1: Study Area Map

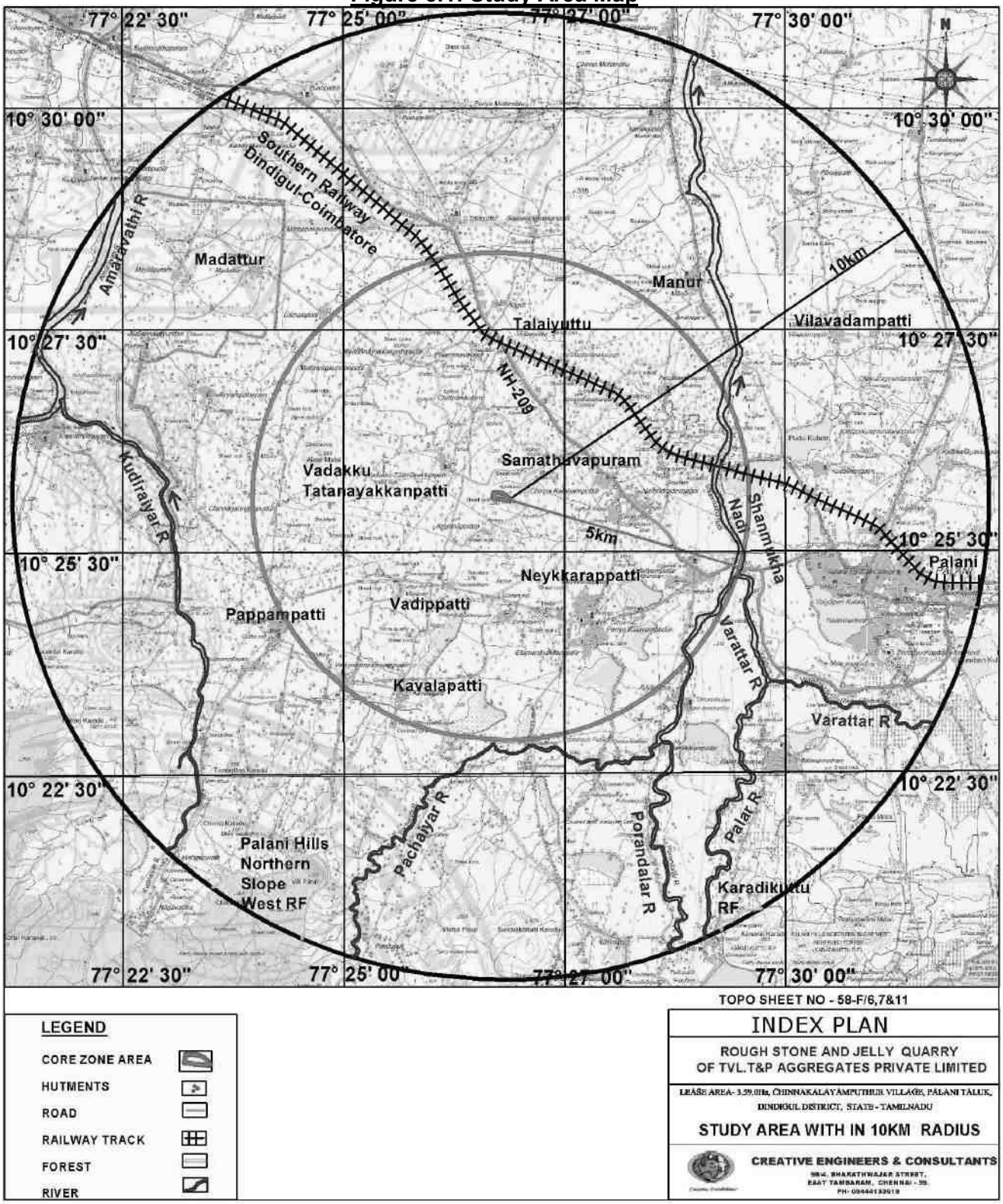


Table 3.2: Environmental Setting of the Study Area

S.No	PARTICULARS	DETAILS
1	Nearest highway	(NH-209) Dindigul – Coimbatore – 1.5km (NE)
2	Nearest Railway station	Palani RS – 7.0km - SE
3	Nearest Airport	Madurai – 98Km – SE
4	Nearest major water bodies	• Drinage channel - 55m (SE), • Odai - 350m(SE), • Pachaiyar R -5.1km - (S), • Varattar R - 5.4km – (SE), • Porandalar R- 6.0Km(SE), • Palar- 6.6Km(SE), • Kudiraiyar R- 6.8Km(W)
5	Nearest town/City	Palani – 7.0km (SE)
6	Nearest villages	• Chinnakalayamputhur – 2.0km (NE) • North Thathanaickenpatty - 1.5 km (NW) • Neikarapatti – 2.5km (NE)
7	Hills / valleys	Nil within 10m radius
8	Notified Archaeologically important places, Monuments	Nil within 10m radius
9	Local Places of Historical and Tourism Interest	Arulmigu Dhandayuthapani Swamy Temple, Palani – 8.5km, SE
10	Environmental sensitive areas, Protected areas as per Wildlife Protection Act, 1972 (Tiger reserve, Elephant reserve, Biospheres, National parks, Wildlife sanctuaries, community reserves and conservation reserves)	Kodikanal wildlife sanctuary - 8.2Km – SW. The Eco-sensitive zone of Kodaikanal wildlife Sanctuary as per Final Notification S.O 412 (E) dated 23.01.2010 of MOEF & CC is 7.2 Kms from the lease boundary and as such this project does not attract NBWL clearance.
11	Reserved / Protected Forests	Nil within 10 km radius
12	Defence Installations	Nil within 10 km radius
13	Seismic Zone	Zone – II (Least Active)
14	Other Industries in the study area	Other than rough stone quarries & crushers, there are no other major industries within 10km radius.

3.2 SOCIO-ECONOMIC CONFIGURATIONS OF THE AREA:

3.2.1 GENERAL:

The Socio-Economic details of the study area are collected through:

- Identification of villages falling from the study area map with combined Taluk map.
- Collection of primary data through sample survey, village meetings and focused group discussion.
- Collection of the demographic pattern of villages falling in the area through NIC 2011 census data.
- Occupational structure of villages falling in the study area through NIC 2011 census data.
- Details of the amenities available in villages falling in the study area through NIC 2011 census data. The findings of the study are illustrated below:

3.2.2 SECONDARY DATA DESCRIPTION:

The proposed quarry is located in in Chinnakalayamputhur Village, Palani Taluk, Dindigul District. Based on 2011 census data, in the 10km radius there are 32 Rural villages from Two Taluks namely Palani, Madathukulam and 6 urban areas of Palani Taluk namely Chinnakalayamputhur(CT), Neikkarapatti (TP), Palani (M), Balasamudram (TP), Sivagiripatti (CT), Sankaramanallur (TP) belonging to Dindigul and Tiruppur District. The demographic profile of the study area is given below:

Table 3.3: Social, Economic and Demographic Profile of the Study Area

Details	Population	Percentage
A. Gender-wise distribution		
Male Population	111072	49.86
Female Population	111696	50.14
Total	**222768**	**100**
B. Caste-wise population distribution		
Scheduled Caste	57800	25.95
Scheduled Tribes	903	0.41
Other	164065	73.65
Total	**222768**	**100**
C. Literacy Levels		

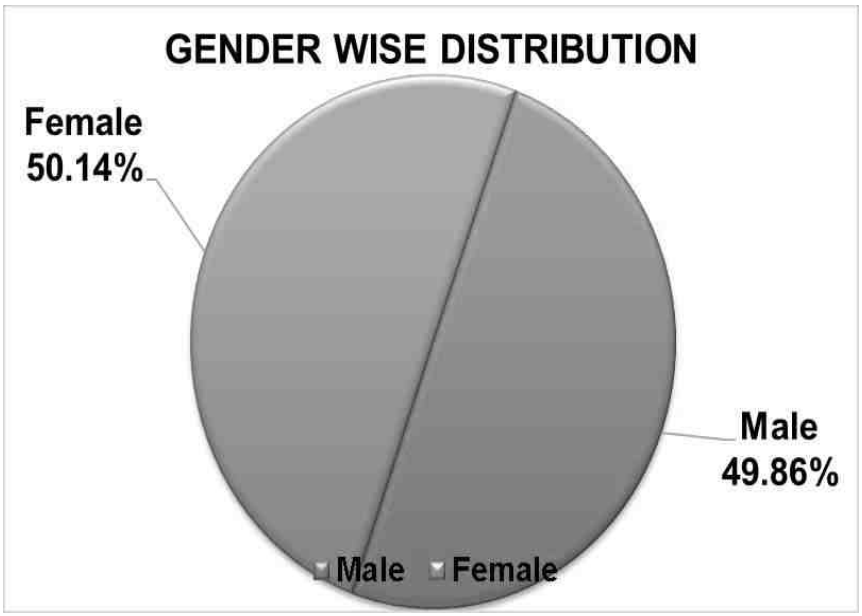
Details	Population	Percentage
Total Literate Population	155702	69.89
Others	67066	30.11
Total	**222768**	**100**
D. Occupational structure		
Main workers	99987	44.90
Marginal workers	7820	3.50
Total Workers	**107807**	**48.40**
Total Non-workers	**114961**	**51.60**
Total	**222768**	**100**

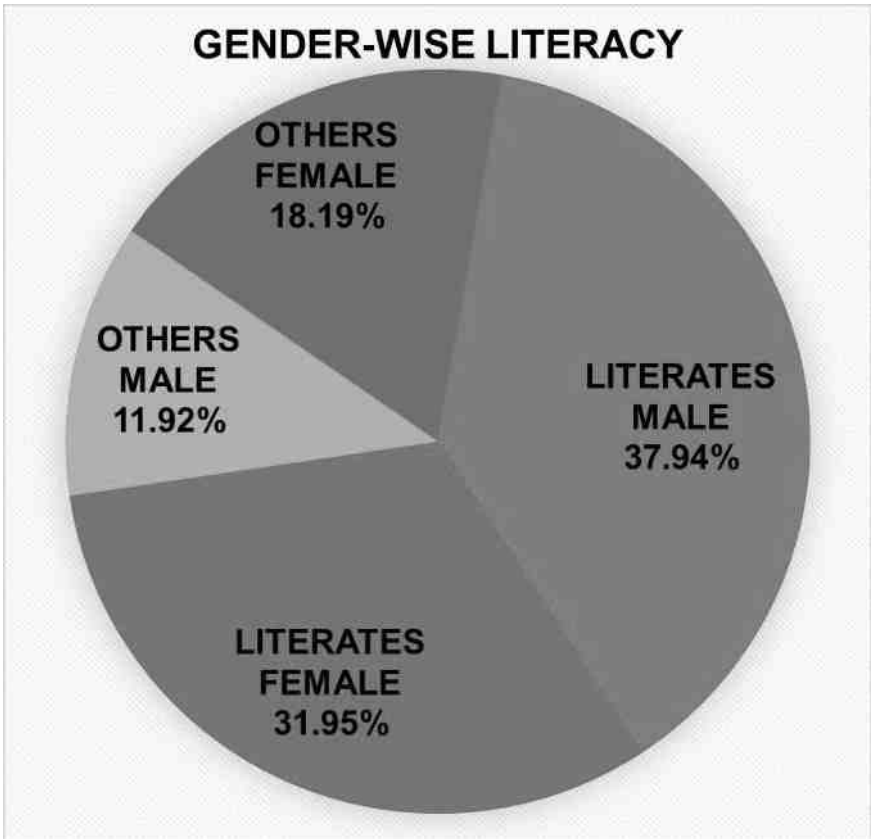
The total population of these 32 rural villages and 6 urban areas is 222768 in which the male population is 111072 (49.86%) and the female population is 111696 (50.14%). This shows that the male and female population ratio is almost equal. Among the total population 0.41% belong to Scheduled Tribes, 25.95 % are Scheduled Caste and the balance 73.65 % people belong to other castes. Among the total population, 69.89% of the people are literate.

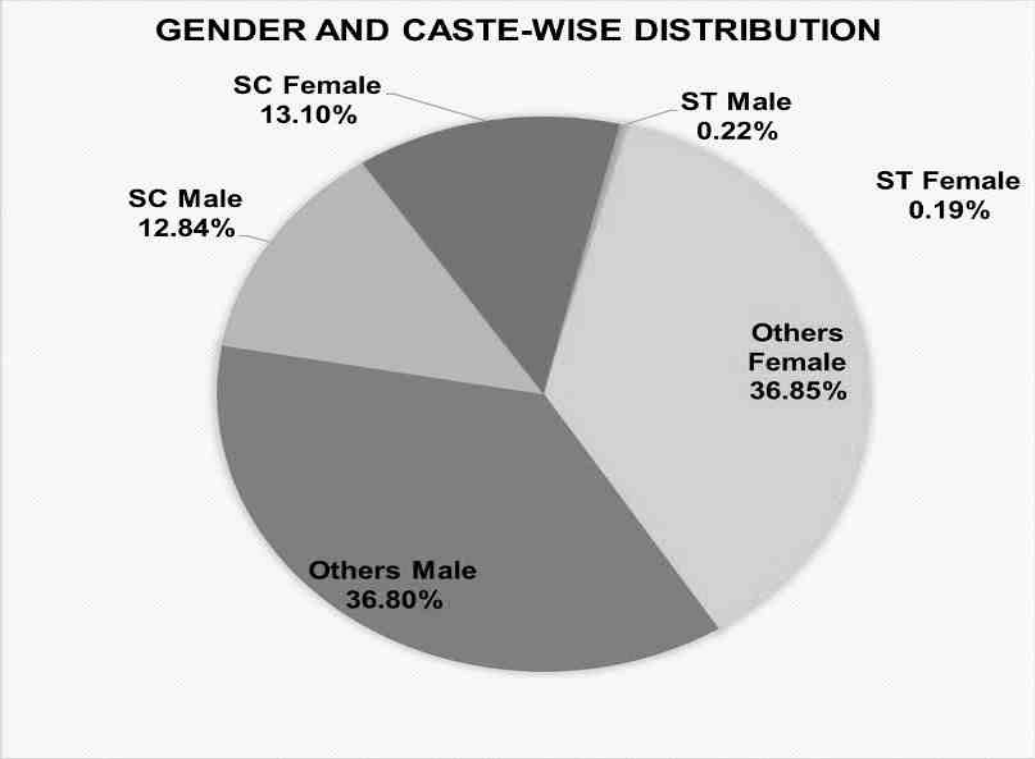
Among the total population, 37.94% are literate males and 31.95% are literate females. This shows that the male literates are slightly more than the female literates.

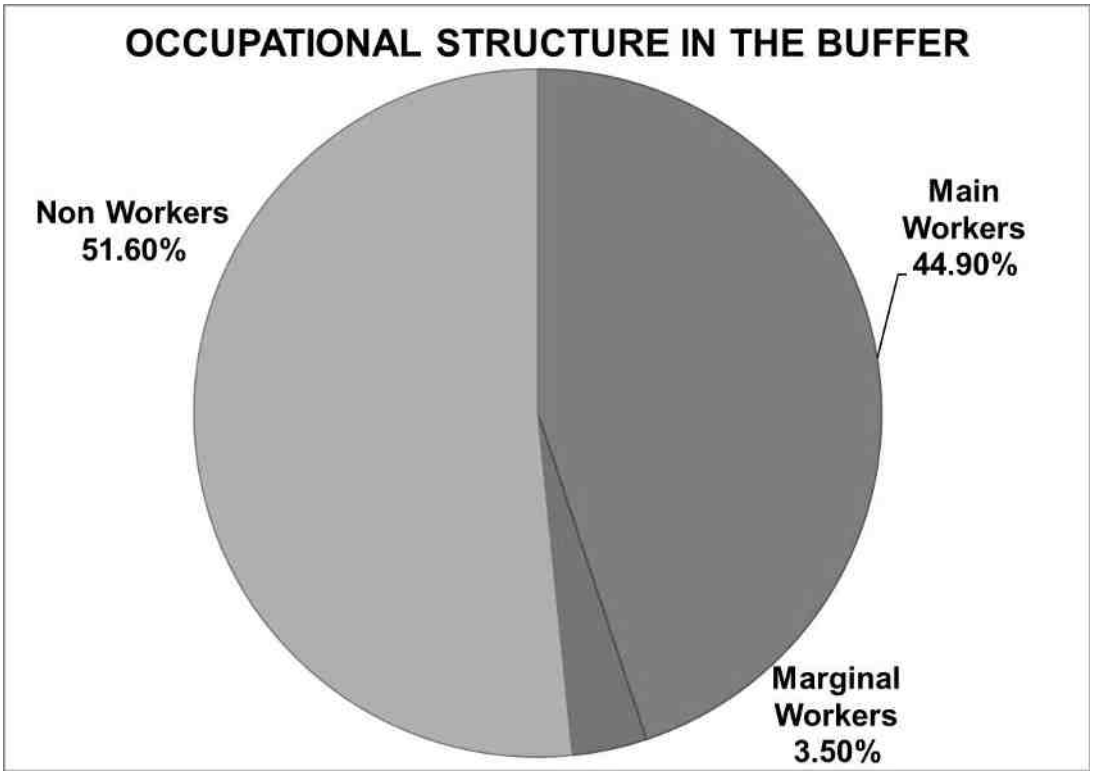
The village wise population, literacy levels and occupational structure details area given in **Annexures 4 and 5.** The demographic structure within the buffer zone is shown diagrammatically in **Figure No – 3.2.**

Figure 3.2: Demographic Structure in Buffer Zone






GENDER AND CASTE-WISE DISTRIBUTION
SC Female
13.10%
ST Male
0.22%
ST Female
0.19%
SC Male
12.84%
Others
Female
36.85%
Others Male
36.80%


OCCUPATIONAL STRUCTURE IN THE BUFFER
Non Workers
51.60%
Main
Workers
44.90%
Marginal
Workers
3.50%

3.2.3 DETAILS OF AMENITIES:

Based on 2011 census data, regarding the educational facilities, there are totally 60 Primary Schools functioning in these 32 rural villages. Among them 15 villages have 1 primary schools, 8 villages have 2 primary schools & Four village has no primary school.

Table 3.4: Primary Schools in the Buffer Zone Rural Villages

S.No	No of Rural Villages	Number of primary schools	Totals
1	4	0	0
2	15	1	15
3	8	2	16
4	1	3	3
5	0	4	0
6	1	5	5
7	1	6	6
8	1	7	7
9	1	8	8
Total	**32**		**60**

Table 3.5: Education Facility Availability

PARTICULARS	Available in village
Govt Primary School	28
Govt Middle School	18
Govt Secondary School	4
Govt Senior Secondary School	1
Govt Arts and Science Degree College	0
Govt Engineering College	0
Govt Medicine College	0
Govt Management Institute	0
Govt Polytechnic	0
Govt Vocational Training School/ITI	0

Better and higher education facilties are available in nearby town like Chinnakalayamputhur(CT), Neikkarapatti (TP), Palani (M), Balasamudram (TP), Sivagiripatti (CT), Sankaramanallur (TP) and Dindigul,Tiruppur city corporation.

Table 3.6: Healthcare Amenities Availability

PARTICULARS	Available in village
Community Health Centre	1
Primary Health Centre	4
Primary Heallth Sub Centre	16
Maternity And Child Welfare Centre	6
TB Clinic	4
Hospital Allopathic	0

Hospiltal Alternative Medicine	0
Dispensary	4
Veterinary Hospital	8
Mobile Health Clinic	0
Family Welfare Centre	4

Better Healthcare facilties are available in nearby town like Chinnakalayamputhur(CT), Neikkarapatti (TP), Palani (M), Balasamudram (TP), Sivagiripatti (CT), Sankaramanallur (TP) and Dindigul,Tiruppur city corporation.

Table 3.7: Infrastructure Facilities

Particulars	Available in village
Tap Water-Treated	28
Covered Well	12
Hand Pump	8
Tube Wells/Borehole	22
Post office	1
bus services	27
Commercial Bank	4
Cooperative bank	10

The details of the educational, medical and infrastructural facilities available in the buffer zone is provided in **Annexures- 6-8.**

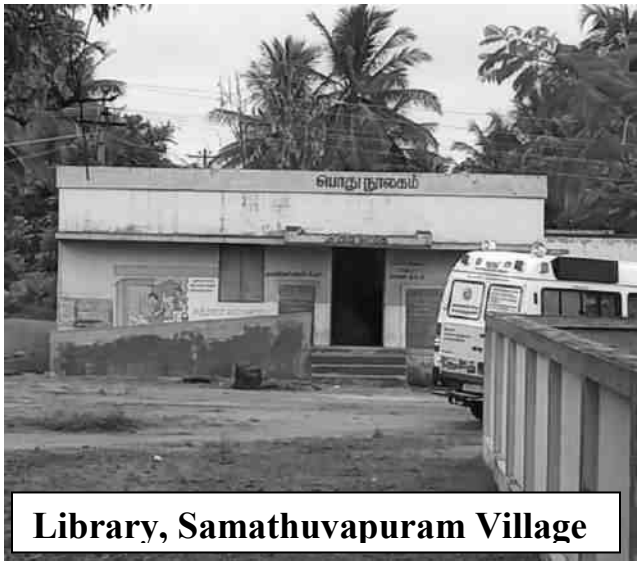
3.2.4 SAMPLE SURVEY:

Studyof the nearby villages to know about socio-economic conditions, including aspirations and requirements of the people show the following:

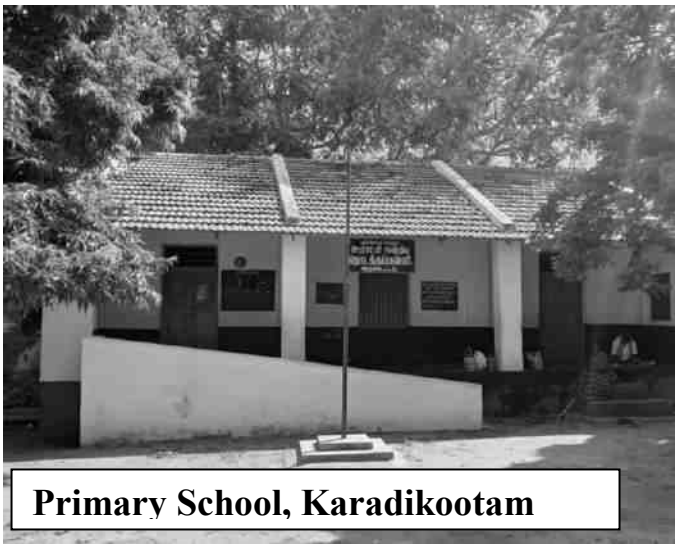
- Predominantly the study area is seasonal agriculture land and mainly fallow land.
- Patches of Coconut plantation and agriculture are observed.
- Majority of the people are farmers and workers in nearby area.
- Reasonably better amenities like approach road bus facility, electricity, mobile phone connectivity, Public Distribution System, banks etc are available.
- Bore well is the main source for drinking water. There are OHT's, Ground level tanks, public taps are available .
- Other allied activities livestock rearing and poultry farming are also found.

Anganwadi, Karadikootam Village

Anganwadi, R.Vadipatti Village

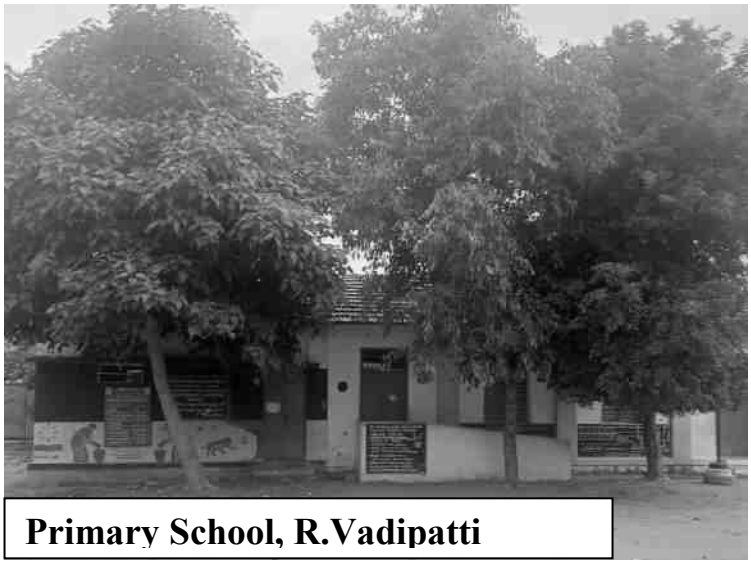


Library, Samathuvapuram Village



Primary School, Karadikootam

Primary School, Samathuvapuram



Primary School, R.Vadipatti

Water Tank, Neykarapatti

VAO, Tataneykarapatti Village

3.3 EXISTING ENVIRONMENTAL QUALITY

3.3.1 MICRO-METEOROLOGY

3.3.1.1 General:

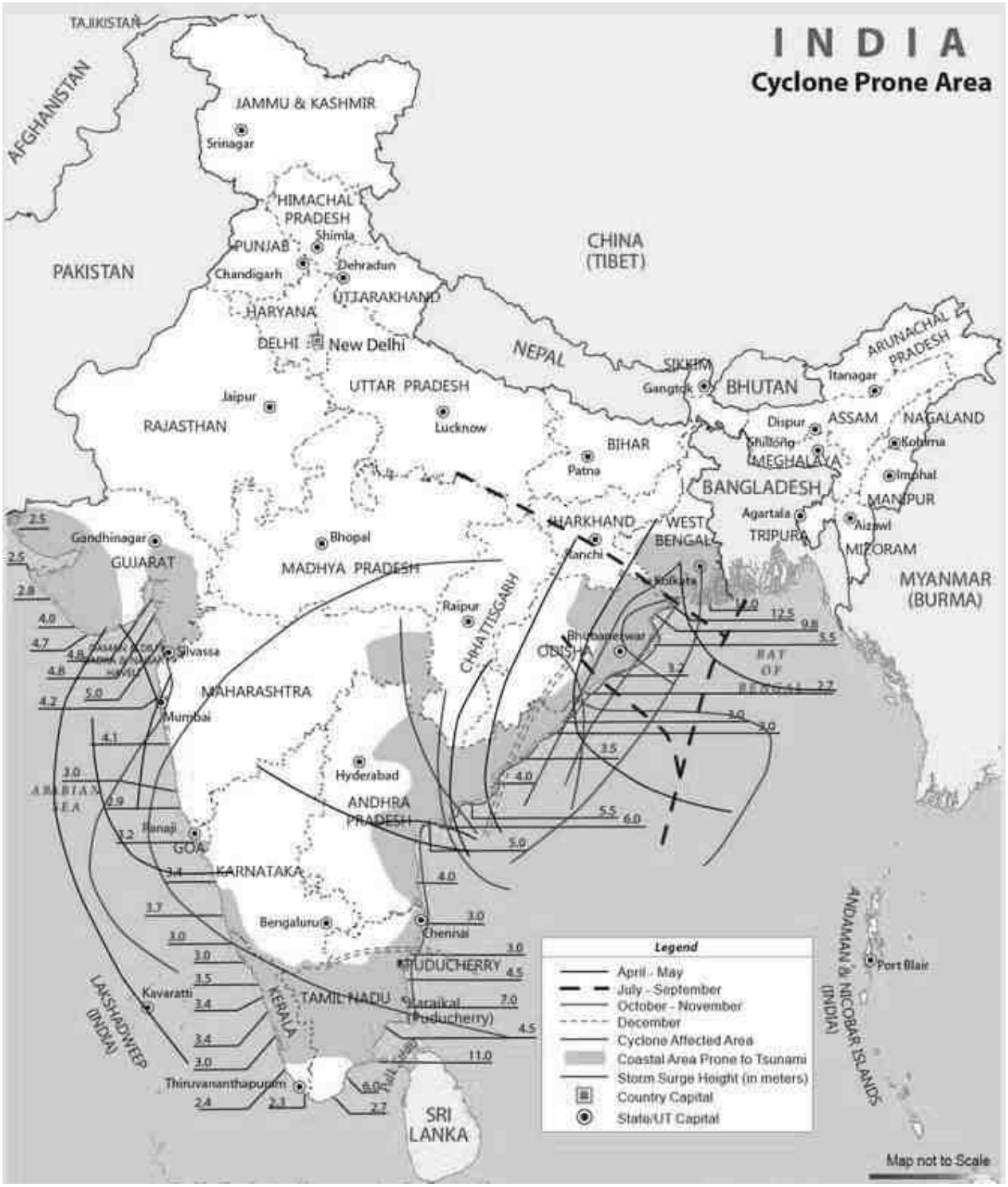
The meteorological conditions in an area regulate the dispersion of air pollutants being released into the atmosphere. The principal variables are horizontal convective transport i.e. wind speed and direction and vertical convective transport, i.e. mixing height, stability class and topography of the area.

3.3.1.2 Historical Meteorological Data:

A. Cyclones And Depressions

Cyclonic storms and depressions in Bay of Bengal affect the East Coast of India. Isolated ones, forming in January to March in the South Bay of Bengal move West-North-westwards and hit Tamil Nadu coast. In April and May, cyclonic storms and depressions form in the South and adjoining Central Bay and move initially to the Northwest, then North and then recurve to the Northeast striking the Arakan coasts in April and Andhra Pradesh (AP)-Orissa-West Bengal (WB) – Bangladesh coasts in May. Most of the monsoon (June – September) storms develop in the central and in the north bay and move west – north - westwards affecting AP – Orissa – WB coasts. Post monsoon (October – December) storms form mostly in the south and central Bay, recurve between 150 and 180 N affecting Tamil Nadu – AP – Orissa – WB – Bangladesh coasts. **Figure No - 3.3** depicts the history of cyclonic storms, which have struck the Indian coast during the months of October, November and December during the last 75 years. (**Source: Vulnerability Atlas of India series, above figure accessed from www.maps of india.com)**. East coast is prone to cyclonic storms round the year but mostly these occur prior to SW i.e., in May and after SW monsoon i.e., in October and November.

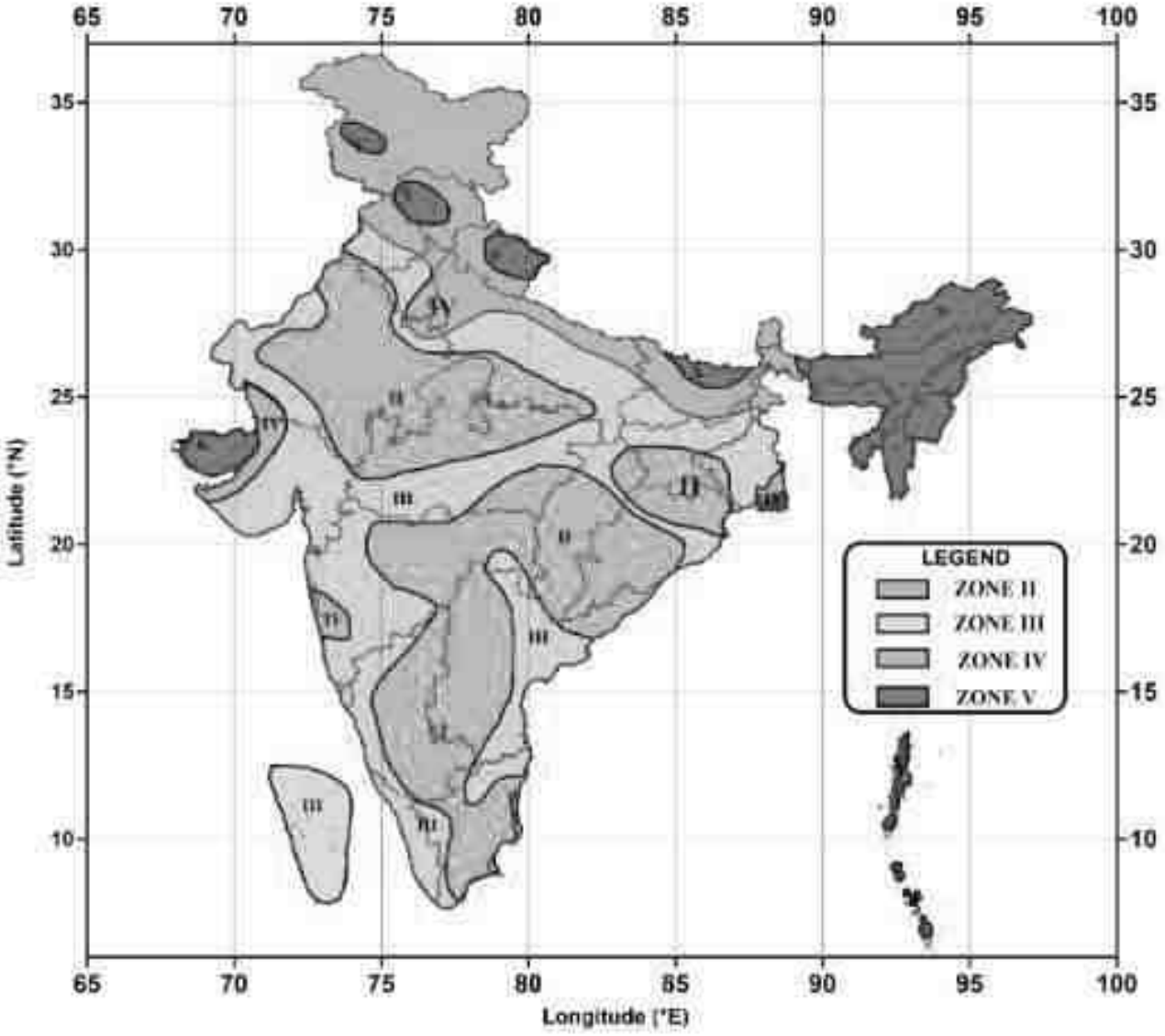
Figure 3.3: History of Cyclonic Storms



B. SEISMIC DATA

From the seismic zone map of India as depicted in the **Figure No - 3.4,** it can be seen that the project site and study area falls in the Zone – II and is described as least active zone.

Figure 3.4: Seismic Zone Map of India



C. Climate and Rainfall Data:

The district enjoys a tropical climate. The period from April to June is generally hot and dry. The weather is pleasant during the period from November to January. The temperature ranging from 22.5°C to 34.3°C in plains and in hilly terrain of the district experiencing a maximum of 22°C in summer and a minimum of 8 °C during winter.

Rainfall: Main rainy season is from October to the middle of January.November is generally the rainiest month.

Rainfall data collected by Dindigul, IMD station for the period of 2011 to 2020 is given in **Table No.3.8** Rainfall histograms are presented in **Figure No - 3.5 and 3.6.**

Table 3.8: Average Annual Rainfall Data (2011-2020)

YEAR	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total Rainfall
2011	20.28	91.32	33.06	93.41	45.59	500.4	290.16	367.98	236.04	170.96	213.25	59.3	2121.75
2012	3.87	4.51	19.12	159.96	53.25	313.97	268.69	358.01	161.13	185.66	66.96	3.05	1598.18
2013	0.4	31.62	38.31	23.75	33.92	19.13	5.45	71.66	85.18	123.63	43.74	43.63	520.42
2014	2.68	2.93	9.3	13.46	192.57	27.04	11.85	110.59	96.72	285.67	44.57	48.8	846.18
2015	23.41	0.06	24.55	128.84	153.09	61.1	18.63	37.89	114.46	104.25	260.48	84.72	1011.48
2016	0.61	0.3	2.28	5.47	102.77	33.31	73.4	28.8	27.68	122.53	22.91	46.72	466.78
2017	26.99	0.23	35.25	8.5	38.35	29.23	7.28	98.57	94.64	118.44	54.18	11.57	523.23
2018	3.03	3.86	13.45	7.05	114.42	20.82	30.04	20.95	104.2	122.58	116.79	8.82	566.01
2019	0.66	3.62	2.52	24.99	23.02	34.13	26.1	35.55	184.27	194.7	101.21	82.83	713.6
2020	1.59	0	5.58	25.95	53.09	85.27	52.38	111.97	168.35	82.01	183.99	118.69	888.87
normal	20.7	12.3	18.2	57.7	72.1	30	45.7	64.7	110.4	184.9	136.3	78	831.6

Source – Dindigul District, IMD

Figure 3.5: Total Rainfall

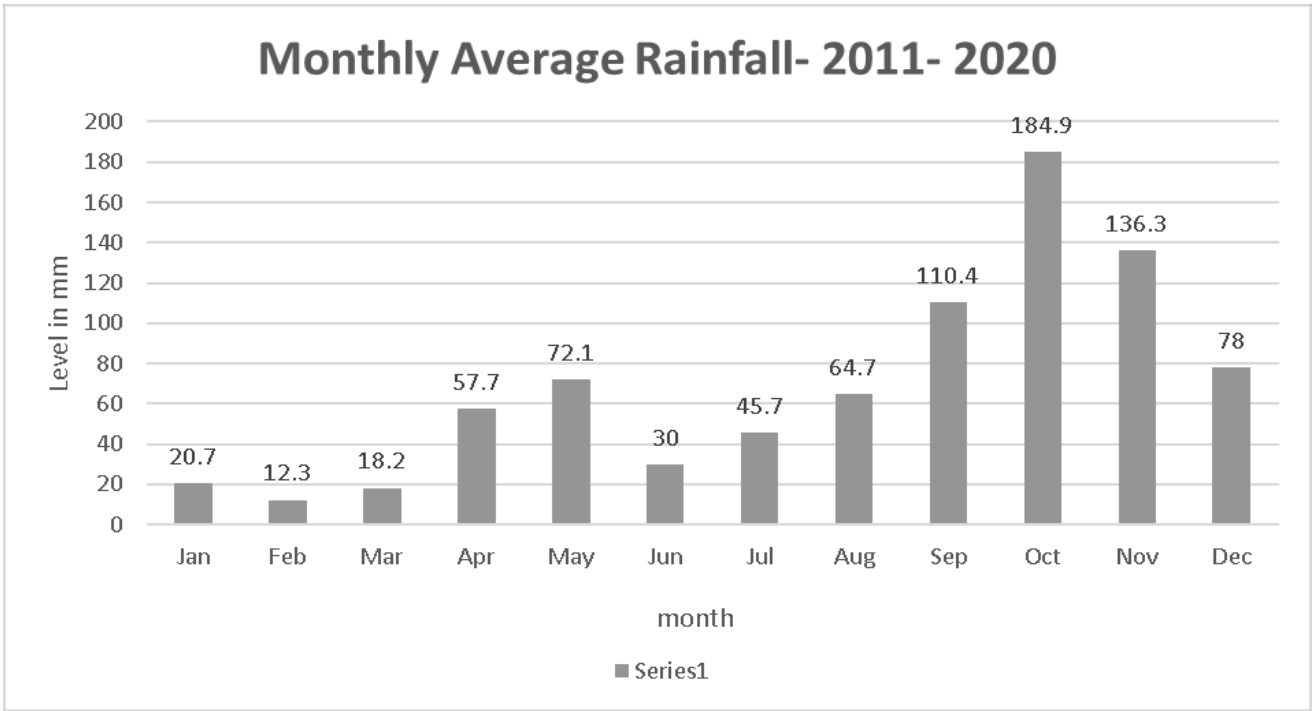
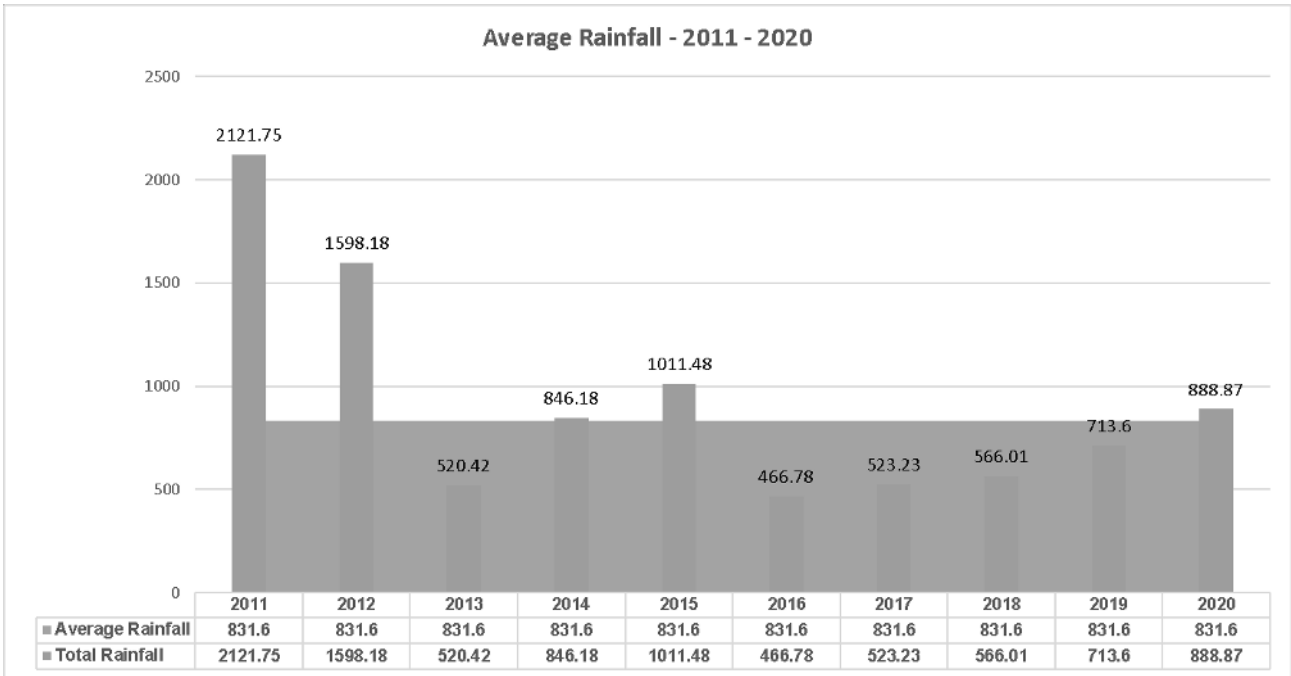


Figure 3.6: Average Annual Rainfall



3.3.1.3 SITE SPECIFIC METEOROLOGICAL DATA:

Micrometeorology and microclimatic parameters of wind velocity, wind direction, ambient temperature, relative humidity, were collected throughout the monitoring period.

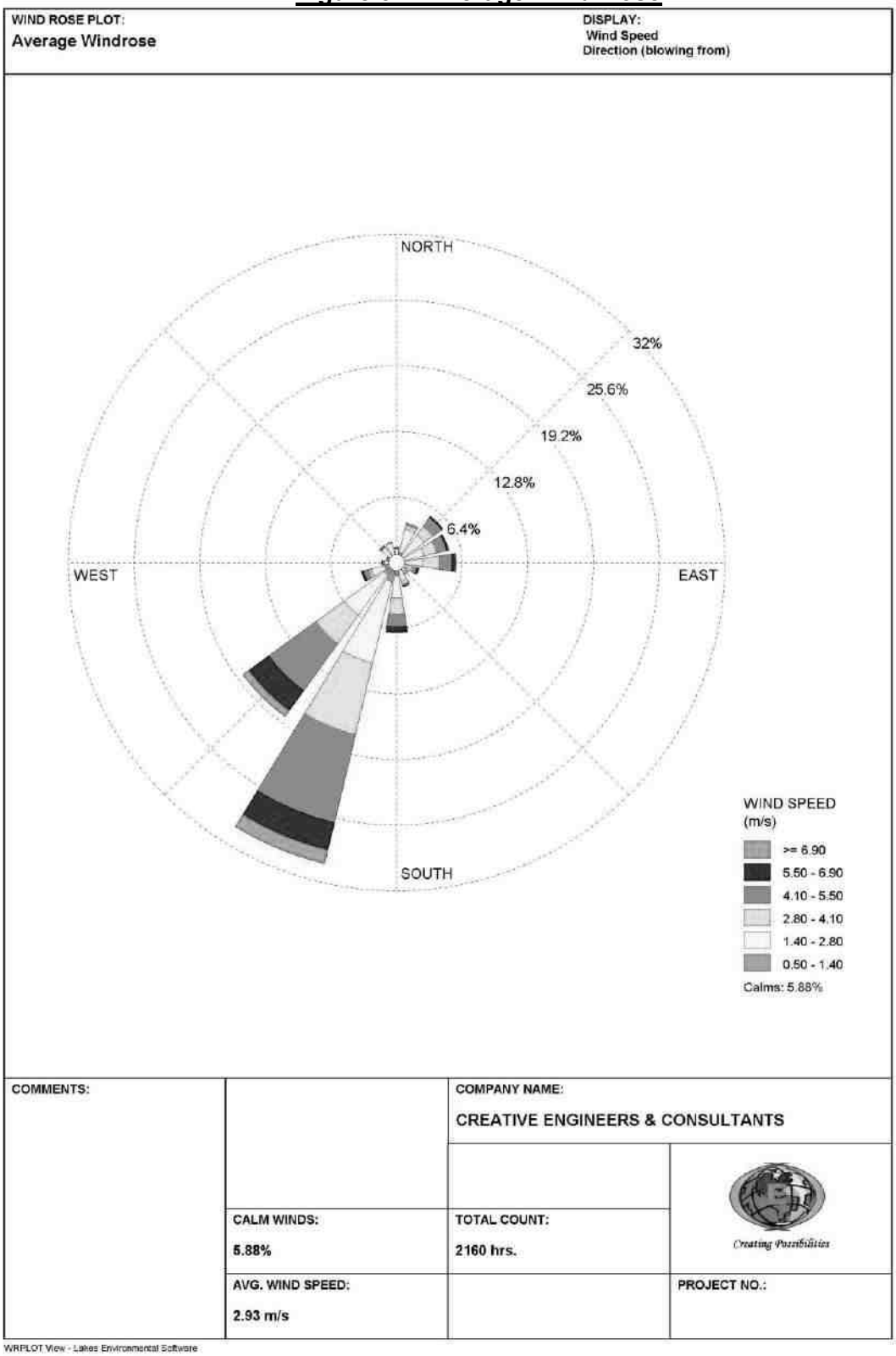
DATA ANALYSIS:

The temperature in the area during the study period ranged from 15.1ºC to 36.1ºC while the relative humidity varied between 12.0 – 98.5%. The wind speed during the study period ranged from <1.8 to 29.5 km/h. The predominant wind direction is from SW. The meteorological data are presented in **Table no – 3.9.** The average wind rose is depicted in **Figure No - 3.7.**

Table 3.9: Meteorological Data

Season: Summer Season, March2022 to May 2022)			
S.NO	**PARAMETERS**	**MIN**	**MAX**
1	Temperature In ^{0}c	15.1	36.1
2	Humidity in %	12.0	98.5
3	Wind speed in km/hr	<1.8	29.5
4	Predominant wind direction from	SSW, SW	

Figure 3.7: Average Wind Rose



3.3.2 AMBIENT AIR QUALITY (AAQ):

Ambient Air quality has been assessed through a network of 5ambient air quality stations. The following methodology has been considered for design of ambient air quality monitoring network in the area. Based on these criteria, 5 numbers of air sampling stations were selected in the area as shown below in Table No.3.10.

- Topography / terrain of study area.
- Populated areas within study area.
- Residential /sensitive areas within study area.
- Magnitude of surrounding industries.
- Representation of regional background levels.
- Representation of cross sectional distribution in down wind direction.
- Predominant wind direction and wind pattern.

Table 3.10: Air Quality Monitoring

1.	**Monitoring Period**	Summer Season (March 2022 – May 2022)
2.	**Monitoring Location**	The location map showing Ambient Air Quality study stations are shown in **Figure No- 3.8.**
3.	**Methodology**	
	Parameter	**Protocol**
	a. Particulate Matter (PM10)	Gravimetric (IS 5182: Part 23:2017)
	b. Particulate Matter PM2.5	Gravimetric (IS 5182: Part 24:2019)
	c. Sulphur Dioxide	Colorimetric (West & Gaeke Method) (IS 5182: Part 02: 2017)
	d. Nitrogen Dioxide	Colorimetric(Modified Jacob & Hocheiser Method) (IS 5182: Part 06:2017)
	e. Carbon Monoxide	CO Monitor
	f. Silica	Colorimetric (Molybdate Method) NIOSH 7601 -2003
4.	**Monitoring Frequency**	2 days in a week, 4 weeks in a month for 3 months in a season.

Table 3.11: Air Quality Monitoring Locations

S.NO	LOCATION CODE	LOCATION	DISTANCE FROM CORE ZONE (KM)	DIRECTION
1	A1	Near Mine Lease Area	-	-
2	A2	Samathuvapuram Village	1.1km	NE
3	A3	Neykarapatti Village	2.4km	SE
4	A4	R.Vadipatti Village	2.7km	SW
5	A5	Tatanayakkanpatti Village	1.1km	NW

Figure 3.8: Ambient Air Quality Study Stations

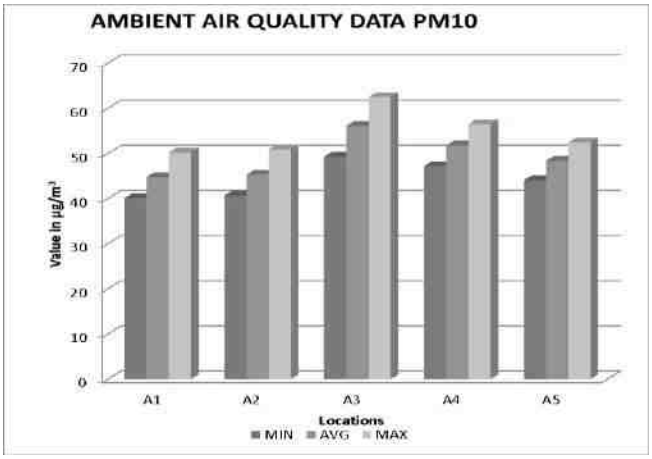
Table 3.12: Ambient Air Quality Data

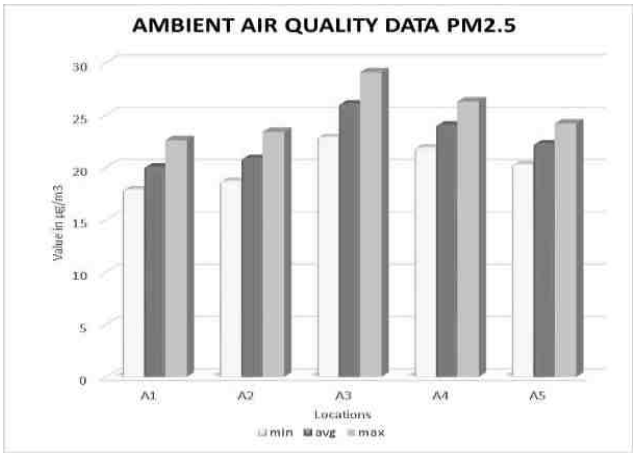
All Value in µg/m^3

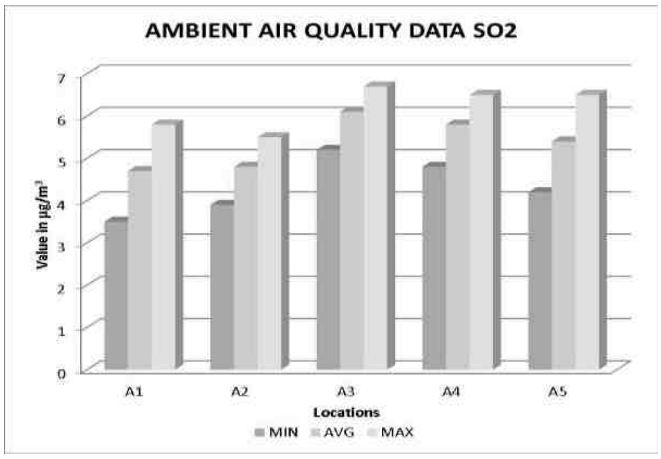
PARAMETERS	Cat.*	PM_{10}			$PM_{2.5}$			SO_2			NO_2		
LOCATIONS		**MIN**	**AVG**	**MAX**	**MIN**	**AVG**	**MAX**	**MIN**	**AVG**	**MAX**	**MIN**	**AVG**	**MAX**
A1-Near Mine Lease Area	I	40.1	44.8	50.2	17.9	20.1	22.6	3.5	4.7	5.8	6.1	7.3	8.4
A2- Samathuvapuram Village	R	40.7	45.3	50.9	18.7	20.9	23.4	3.9	4.8	5.5	5.9	7	7.9
A3- Neykarapatti Village	R	49.3	56.1	62.5	22.9	26.1	29.1	5.2	6.1	6.7	7.1	8.3	9.4
A4- R.Vadipatti Village	R	47.2	51.8	56.5	21.9	24.1	26.3	4.8	5.8	6.5	6.5	7.6	8.6
A5- Tatanayakkanpatti Village	R	44.1	48.4	52.5	20.3	22.3	24.2	4.2	5.4	6.5	6.6	7.8	8.9
NAAQ Limits		**PM_{10}**			**$PM_{2.5}$**			**SO_2**			**NO_2**		
	*	**100**			**60**			**80**			**80**		
	**	**100**			**60**			**80**			**80**		

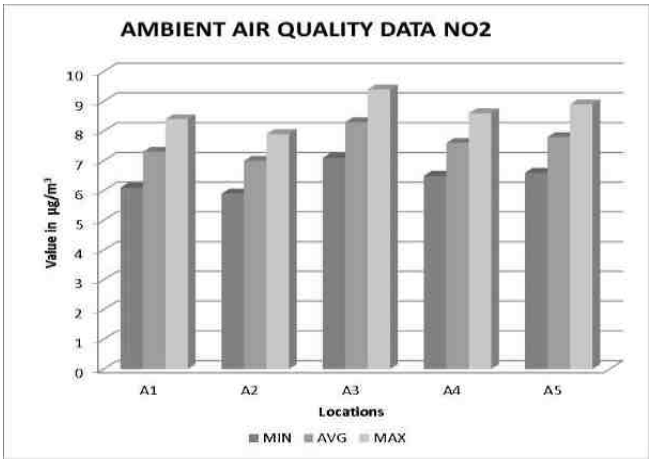
***Note:** Category: * - Industrial, Residential, Rural and other area, ** – Ecologically Sensitive Area (notified by Central Government)*

Figure 3.9: Ambient Air Quality Data









3.3.2.1 Results and Discussion:

The AAQ monitored data for all locations for above parameters are shown in **Table No - 3.12 and** in **Figure No - 3.9.** Ambient Air Quality data during the study period is given in **Annexure-9.** From the table it is seen that, in the ambient air, the PM_{10} values were in the range of 40.1-62.5µg/m^3. $PM_{2.5}$ values were in the range of 17.9-29.1 µg/m^3. SO_2 levels were ranging from 3.5– 6.7 µg/m^3. NO_2 levels were ranging from 5.9-9.4 µg/m^3.

The existing Ambient Air Quality levels for PM_{10}, $PM_{2.5}$, SO_2 and NO_2, are within the NAAQ standards prescribed CPCB limits of 100 µg/m^3, 60 µg/m^3, 80 µg/m^3 & 80 µg/m^3. The CO values in all the locations were found to be below detectable limit. Silica values in the study area are found to be below detectable limit. (Detection limit – 0.05 mg/m^3)

3.3.3 WATER ENVIRONMENT:

Assessment of baseline data on water environment includes Identification of water resources, Collection of water samples and Analyzing water samples collected for physico-chemical parameters as per standards. The water sampling was carried out for 4 locations. Details of the same has been provided below:

Table 3.13: Water Quality Monitoring

1.	**Monitoring Period**		Summer Season (March 2022 – May 2022)		
2.	**Monitoring Location**		The location map showing water sampling locations are given in **Figure No.3.10.**		
	Code	**Location**	**Sample Type**	**Distance**	**Direction**
	W1	Near Mine Lease Area	Bore Well	--	--
	W2	Neykarapatti Village	Borewell	2.4km	SE
	W3	R.Vadipatti Village	Borewell	2.7km	SW
	W4	Tatanayakkanpatti Village	Borewell	1.1km	NW
3.	**Methodology**		Sampling - IS 3025 Part - I		
			Analysis – IS 3025 relevant parts / APHA 23rd Edition		

Figure 3.10: Location of Water Sampling Stations

Table 3.14: Summary of Water Quality Data

Season	March 2022 to May 2022	
Monitoring Locations	4 locations	
Parameters	**Range of values**	**Limits***
pH at 25 ˚C	8.02 – 8.25	**6.5-8.5**
Total Dissolved Solids, mg/L	215 – 1250	**2000**
Chloride as Cl-, mg/L	29.4 – 479	**1000**
Total Hardness (as CaCO3), mg/L	122 – 561	**600**
Total Alkalinity (as CaCO3), mg/L	144– 248	**600**
Sulphates as SO42-, mg/L	21.4 – 345	**400**
Iron as Fe, mg/L	BDL(D.L - 0.01) – 0.09	**0.3**
Nitrate as NO3, mg/L	BDL(D.L - 1.0) – 2.73	**45**
Fluoride as F, mg/L	0.11 – 0.42	**1.5**

3.3.3.1 Results and Discussion:

The results of the water sample analysis are shown in **Table No - 3.14.** The pH values were ranging in between 8.02 – 8.25 TDS values were in the range of 215 – 1250mg/L. Chloride values were ranging from 29.4 – 479mg/L. Iron content was found to be in the range BDL(D.L - 0.01) – 0.09mg/L. The water quality of ground water is found to be within the prescribed Permissible limits of IS: 10500 Norms in the absence of an alternative source as per Drinking Water Specifications. The water quality data is provided in **Annexure-10.**

3.3.4 NOISE ENVIRONMENT:

Opearional phase of this project may lead to increase noise levels from the existing levels at least in and around the project area. As noise level beyond permissible limits will cause adverse impacts on the environment, it has become imperative to assess the noise levels in and around the mine area. Noise level measurements were taken at the 5 locations during the monitoring period. Details of the same are provided below:

Table 3.15: Noise Level Monitoring

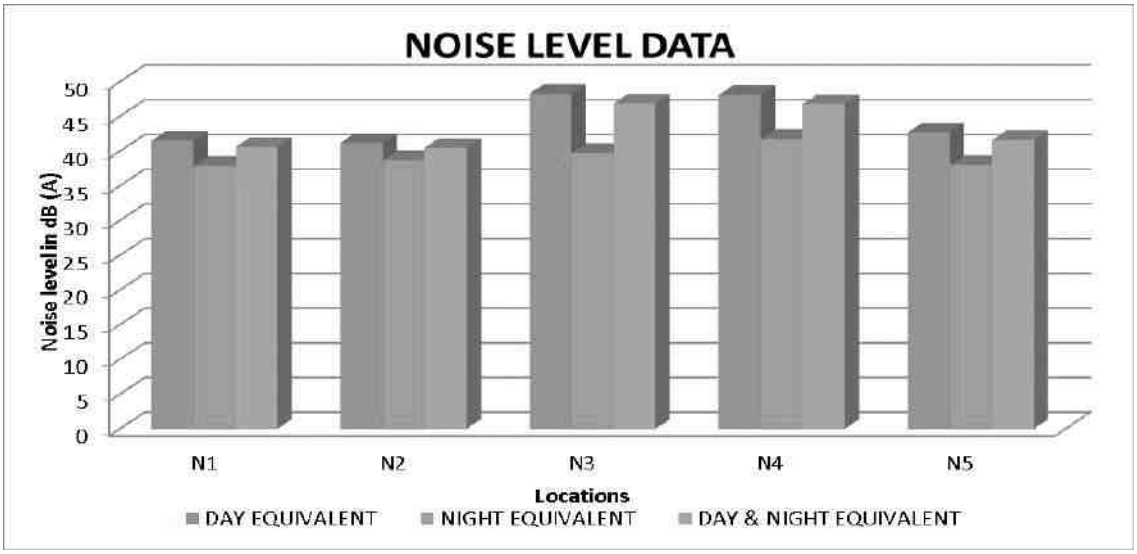
1.	**Monitoring Period**	Summer Season (March 2022 – May 2022)		
2.	**Monitoring Location**	The location map showing noise monitoring locations are given in **Figure No.3.11.**		
	Code	**Location**	**Distance**	**Direction**
	N1	Near Mine Lease Area	-	-
	N2	Samathuvapuram Village	1.1km	NE
	N3	Neykarapatti Village	2.4km	SE
	N4	R.Vadipatti Village	2.7km	SW
	N5	Tatanayakkanpatti Village	1.1km	NW
3.	**Methodology**	Noise levels were measured using sound level meter manufactured by (Model No - SL- 4001, Make - Lutron). Sound Pressure Level (SPL) measurements were measured at all locations where ambient air quality monitored; one reading for every hour was taken for 24 hours.		
4.	**Monitoring Frequency**	Once during monitoring period		

Figure 3.11: Location of Noise Sampling Stations

Table 3.16: Ambient Noise Level in dB (A)

Date and time of monitoring	N1	N2	N3	N4	N5
Day Equivalent	41.5	41.2	48.3	48.1	42.7
Night Equivalent	37.9	38.7	39.8	41.8	38.0
Day & Night Equivalent	40.6	40.5	46.9	46.8	41.6

Figure 3.12: Noise Level Data



3.3.4.1 Results and Discussion:

The results of noise levels for all locations are given in **Table No-3.16**.The noise values for all above locations are shown in a comparative chart given in **Figure No - 3.12.** In the buffer zone, day Equivalent Noise (Leq-d) noise levels were ranging from 41.2 dB(A) to48.3 dB(A) and night Equivalent Noise (Leq-d) levels ranged between 37.9 dB(A) to 41.8dB(A). While comparing with the MOEF&CC Norm of 55 dB(A) for day time and 45 dB(A) for night time, the monitored ambient noise levels were within the limit values for Residential areas.

3.3.5 SOIL CHARACTERISTICS:

Soil samples were collected in 3 locations in the core and buffer zone to analyse the physiochemical characteristics of the soil in the area. Elaborate details of the same has been provided below.

Table 3.17: Soil Quality Monitoring

1.	**Monitoring Period**	Summer Season (March 2022 – May 2022)		
2.	**Monitoring Location**	The location map showing soil sampling locations are given in **Figure No.3.13.**		
	Code	**Location**	**Distance**	**Direction**
	S1	Near Mine Lease Area	-	-
	S2	Neykarappatti Village	2.4km	SE
	S3	R.Vadipatti Village	2.7km	SW
3.	**Methodology**	Composite soil samples using sampling augers and field capacity apparatus.		
4.	**Monitoring Frequency**	Once during monitoring period		

Figure 3.13: Location of Soil Sampling Stations

Table 3.18: Soil Quality Data

S.No	Parameters	Unit	S1	S2	S3
1	pH at 25°C	-	7.12	6.85	6.74
2	Electrical Conductivity	(µmhos/cm)	35.21	42.67	32.26
3	Dry matter content	%	96.86	98.45	97.34
4	Water Content	%	3.14	1.55	2.66
5	Organic Matter	%	0.68	0.75	0.72
6	Soil texture	-	loam	Clay loam	loam
7	Grain Size Distribution i. Sand	%	50.54	25.87	44.71
8	ii. Silt	%	32.87	36.87	28.65
9	iii. Clay	%	16.59	37.26	26.64
10	Phosphorous	µg/g	1.57	1.32	2.05
11	Sodium	mg/kg	410	342	386
12	Potassium	mg/kg	640	610	752
13	Total Nitrogen	mg/kg	142	180	210
14	Total Sulphur	%	BDL(D.L - 0.02)	BDL(D.L - 0.02)	BDL(D.L - 0.02)

3.3.5.1 Results and Discussion:

Results of the soil samples show that the pH values were ranging between 6.74 to 7.12 and Electrical Conductivity values were ranging between 32.26 – 42.67 µmhos/cm. Soils are generally clay loam and loam type. Organic matter values were ranging between 0.68 – 0.75 %.

Total Nitrogen values were ranging between 142 - 210 mg/kg. Phosphorus values were ranging between 1.32 – 2.05 µg/g. Potassium values were ranging between 610 -752 mg/kg. Sodium values were ranging between 342- 410 mg/kg. Total Sulphur values were observed to be BDL. The soil quality data for the 3 samples collected and analyzed are provided in **Table No – 3.18.**

3.4 LAND ENVIRONMENT - LANDUSE & LAND COVER

For preparing an impact statement, aspects of the land conditions are covered under land use. An industrial project / mine can cause changes in land use, soil process in different intensities depending upon the size of the project and distance involved between the industries and the area. Here, land use status for a radius of 10 km has been studied.

3.4.1 DATA USED AND METHODOLOGY

For the present study on land use pattern of buffer area around the proposed stone and gravel quarry, an archived historical data of Sentinel 2 data shas been used as base data acquired on

April 2022 (Figure No.3.14) has been used to generate the require landuse map showing their spatial pattern within the buffer area. The table showing data used for generation of information on landuse and subsequent GIS analysis is given below

Table 3.19: RS satellite image used for the present study

S.No	Type of Data	Date	Generated Map
1.	Sentinel 2	April 2022	Landuse (LU) Map showing 10 Km around the ML area

Interpretation of satellite image requires understanding of relationship between image elements and their respective terrain elements. Since, in the present study, the landuse information is obtained using visual interpretation, an interpretation key is generated. The image elements such as color, tone, texture, size, shape and associated elements have been used to delineate various landuse categories. The landuse categorization and nomenclature used in the present study is based on the national level landuse classification system, which is adopted for the entire country as recommended by NationaL Remote Sensing Centre (NRSC), Department of Space, Government of India.

Figure 3.14 : Sentinel 2 Satellite Data of the Study Area

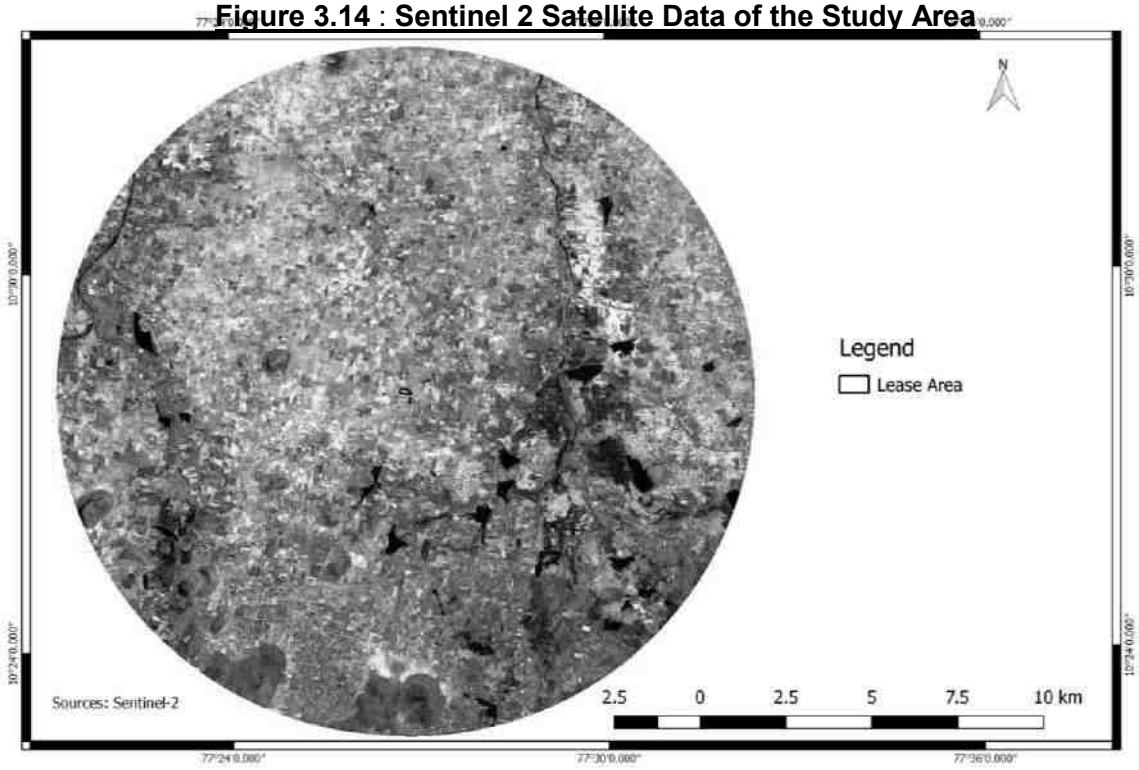


Table 3.20: Major Landuse Units of the Study Area

S.No	Major Category	Landuse unit
1	Built-Up Land	Village, Town, Industrial / Vacant Area
2	Agricultural Land	Crop Land Fallow Land Plantation Farm Land
3	Forest Land	Open Scrub Forest
4	Waste Land Mining Area	Land With Scrub/ Land Without Scrub Barren Rocky/ Stony Waste Quarries / Abandoned Quarries
5	Waterbodies	Tanks/ Rivers / Streams

Such LandUse and Land cover (LULC) categories have been verified using field check and identified sample sites within the buffer area, verified on field and transferred into gis geo-coordinates using observation coordinates received from hand held GPS (global positioning system) instrument. Thus, an interpreted final landuse map has been generated (Figure No. 3.15) using above such elaborate procedure and transformed into GIS environment for its spatial distribution and area estimation. Spatial nature and extent of various landuse categories within the buffer area is discussed is given below:

Figure 3.15: Map Showing Land Use Categories around 10km Buffer

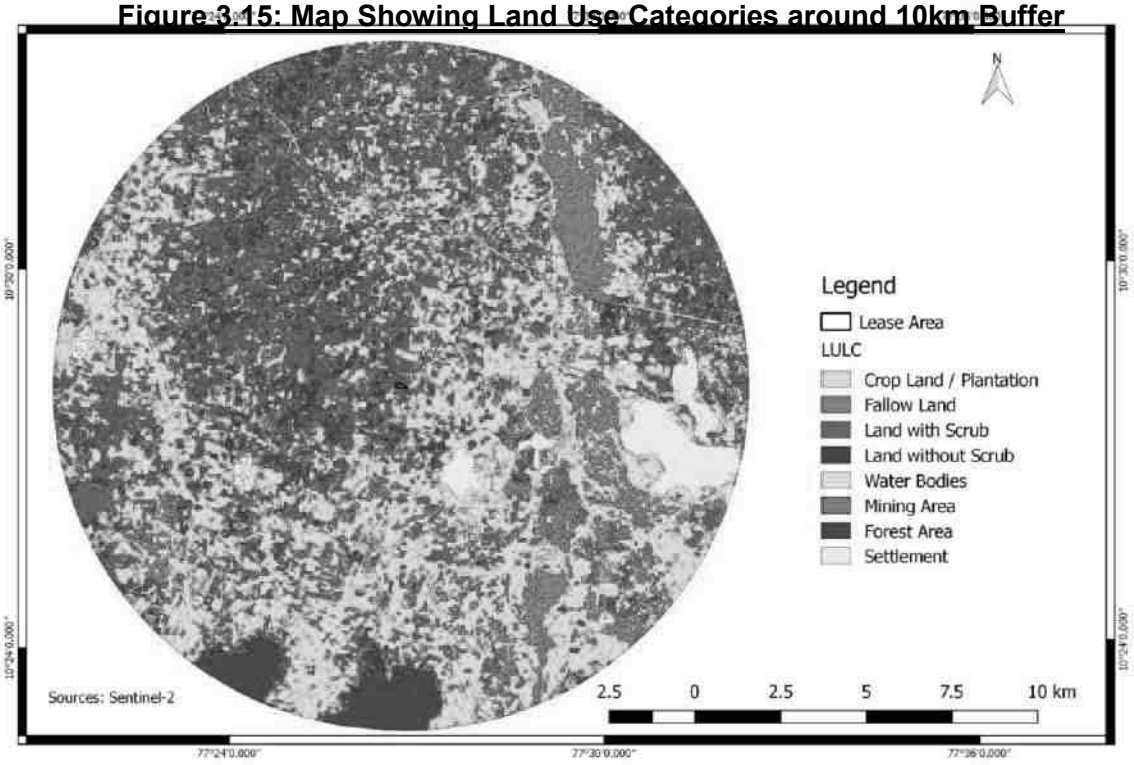


Table 3.21: Area Estimation of Landuse Categories in Buffer Zone

S.No	Landuse Feature	Area (Sq.Km)	Percentage
1	Agriculture/ Plantation	123.07	38.12
2	Fallow Land	63.75	19.74
3	Land With Scrub	84.29	26.10
4	Land Without Scrub	23.33	07.23
5	Water bodies	06.52	02.02
6	Mining Area/ Industries	01.25	00.39
7	Reserve Forest	08.51	02.63
8	Settlement	12.16	03.77
	Total	**322.88**	**100.00**

From the above table it is seen that 38.12 % of the study area is agriculture land and 19.74 % are fallow land. Land with scrub constitutes 26.10 %, lands without scrub constitute 7.23% waterbodies constitute 2.02% and remaning others constitute 6.79 %.

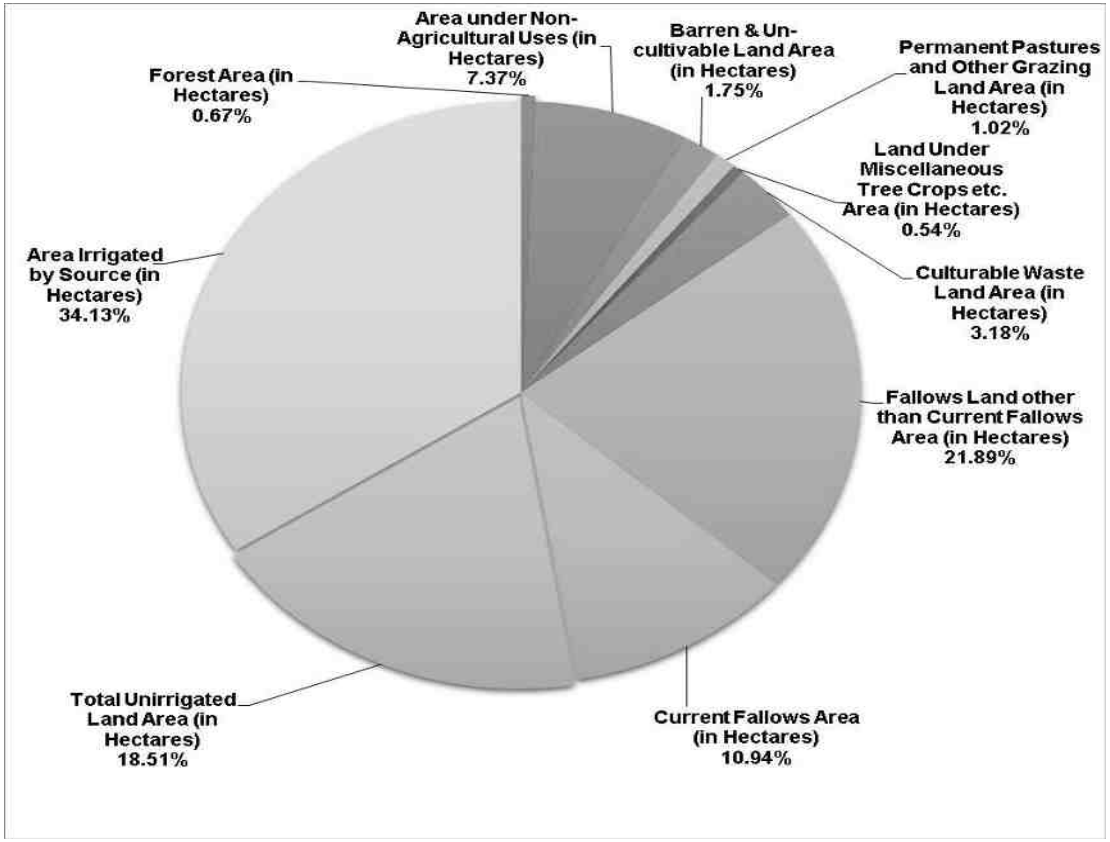
3.4.2 LAND USED BASED ON REVENUE RECORDS:

The lease area falls in Gopalapuram Villae, Vembakottai Taluk, Virudhunagar District, Tamil Nadu state and the study area for the land use pattern (10 km radius) has been divided into four zones viz. Zone-I (0-2 km), Zone-II (2-5 km), Zone-III (5-10 km) and Zone-IV (0-10 km) respectively. The land use pattern of the study area falling within 10 km radius around the proposed project area is presented in Table no - 3.22. Village wise land use pattern is provided in **Annexure-11.**

Table 3.22: Land Use Pattern of the Study Area Falling Within 10 Km Area in (Ha)

VILLAGE NAME	Total Geographical Area	Forest Area	Area under Non-Agricultural Uses	Barren & Un-cultivable Land Area	Permanent Pastures and Other Grazing Land Area	Land Under Miscellaneous Tree Crops etc. Area	Culturable Waste Land Area	Fallows Land other than Current Fallows Area	Current Fallows Area	Total Un irrigated Land Area	Area Irrigated by Source
0- 2 KM	1495.93	0	262.5	444.41	0	0	0.02	0	206.71	480.5	101.79
2 - 5 KM	4745.88	0	530.1	16.02	153.91	62.21	144.6	251.72	240.26	1171.3	2175.76
5-10 KM	30496.33	244.5	1915.81	180.79	221.76	137.42	1024.55	7790.06	3572.01	5147.43	10262
Total	**36738.14**	**244.5**	**2708.41**	**641.22**	**375.67**	**199.63**	**1169.17**	**8041.78**	**4018.98**	**6799.23**	**12539.55**

Figure 3.16: Landuse within the Buffer Zone Area



3.5 BIOLOGICAL ENVIRONMENT:

Study of the biological environment of any area comprises of well-planned ecological survey for the floristic and faunal composition of the areas through various scientifically planned techniques. Accordingly the ecological survey for the proposed quarry area including core and buffer zone were carried out to identify various species occurring in the area.

3.5.1 FLORA:

An ecological survey of the study area was conducted with reference to listing of species and assessment of the existing baseline ecological conditions. The objective of the survey is as follows:

- ❖ Generate existing data from field observations of various terrestrial floristic occurrences.
- ❖ Collect secondary data from Government records as well as through discussion with Forest officials, knowledgeable public etc.,
- ❖ Compare the data with authentic past records to identify changes, if any.
- ❖ Identify the impact of project operations on the biological aspects.

To accomplish the above objectives, a general ecological survey covering an area of 10 km radius was conducted. The locations were identified for phyto-sociological aspects to assess the current status.

3.5.1.1 <u>Sampling Methodology:</u>

In order to provide representative ecological status for the study area, the 10-km radius buffer area has been divided into four quartiles for biodiversity sampling, i.e., NE (Q-1), NW (Q-2) SW (Q-3) and SE (Q-4). Each of the quartiles have been examined for representative flora on randomly sampled quadrats for trees (10x10 m), shrubs (5x5 m) and herbs (1x1 m) depending upon prevailing geographical conditions and bio-diversity aspects of study area.

Phyto-sociological Survey: Phyto-sociological parameters, viz., Abundance (i.e., density), average and minimum stems were measured to determine the distribution and ecological aspects of the species. Abundance is a measure of the density of distribution of an individual species within a given area. It is calculated by summed individuals of a species. Average species number is calculated for all quadrates; similarly, minimum number of individuals

represented is recorded at quadrats level. A total of 10 quadrats were laid down in core area and a total of 20 quadrats were laid out in four quartiles (5 each) of buffer area.

Quadrats method for flora : Quadrats of 10 × 10m were laid down randomly within core and 10kms buffer area; each quadrat was laid to assess the trees (>5 cm GBH) and 5 × 5 m sub-quadrat nested within the quadrat for shrubs and two plot 1 × 1 m for herbs . The quadrats were laid at a minimum distance of a kilometer apart to maximize the sampling efforts and minimize the species homogeneity, such as small stream area, trees in agricultural bunds, tank bunds, farm forestry plantations, natural forest area, avenue plantations, house backyards, etc. In each sample quadrate, individuals belonging to tree, shrub and herb species were recorded separately, and have been identified on the field. The prevailing land use and habitat quality has been noted down for each location on the field.

Vegetation Analysis using index: Species diversity will be calculated by using Shannon and Wiener (1963) formula as follows:

$$H' = -\sum_{i=1}^{R} p_i \ln p_i$$

Whereas,

H´ is Shannon index of general diversity,

p_i is often the proportion of individuals belonging to the ith species in the dataset of interest.

Evenness index was calculated as: E = H´/Hmax,

Whereas Hmax = log2 (number of species in the plot)

Photos of Lease Area

A.CORE ZONE:

The lease area is a non-forest, private land with grsses shrubs, few trees like Prosopis juliflora, neem etc. There are 4 trees species from 3 families followed by 5 shrubs from 4 families, 5 species of herb from 5 families, 3 species of climbers from 3 families and 2 species of grasses from 2 families were recorded in the core zone. The detailed list of plants found in the core zone are given in Table no – 3.23.

Table 3.23: List of Floristic Species in the Core Zone

Sl.No	Species Name	Common Name	Family
Trees			
1	*Acacia nilotica*	Fabaceae	Karuvelan
2	*Prosopis juliflora*	Fabaceae	Cimaikkaruvel
3	Morinda pubescens	Rubiaceae	Nuna
4	*Azadirachta indica*	Meliaceae	Vembu
Shrubs			
1	*Lantana camara*	Verbenaceae	Uni
2	*Calotropis gigantea*	Apocynaceae	Earukku
3	*Jatropha glandulifera*	Euphorbiaceae	Vellaikattukottai
4	*Carissa spinarum*	*Apocynaceae*	*Chirukila*
5	*Cassia auriculata*	*Caesalpinaceae*	*Aavaram*
Herbs			
1	*Tridax procumbens*	Asteraceae	Vettukai poondu
2	*Solanum nigrum*	Solanaceae	Manathakkali
3	*Sida acuta*	Malvaceae	Palambasi
4	*Achyranthes aspera*	Amaranthaceae	Nayuruvi
5	Cleome viscosa	Cleomaceae	Naivelai
Climbers			
1	Abrus precatorius	Kundumani	Fabaceae
2	Asparagus racemosus	Thanneervittan	Liliaceae
3	Cissus quadrangularis	Perandai	Vitaceae
Grasses			
1	Cyperus rotundus	Cyperaceae	Korai pullu
2	Cynodon dactylon	Poaceae	Arugampillu

B.BUFFER ZONE:

The Dominated species are Albizia amara, Borassus flabelliformis, Morinda tinctoria, Azadirachta indica, Cocus nucifera etc. Patches of coconut farms are also observed. The detailed list of plants found in the Bufferzone is given in Table no – 3.24.

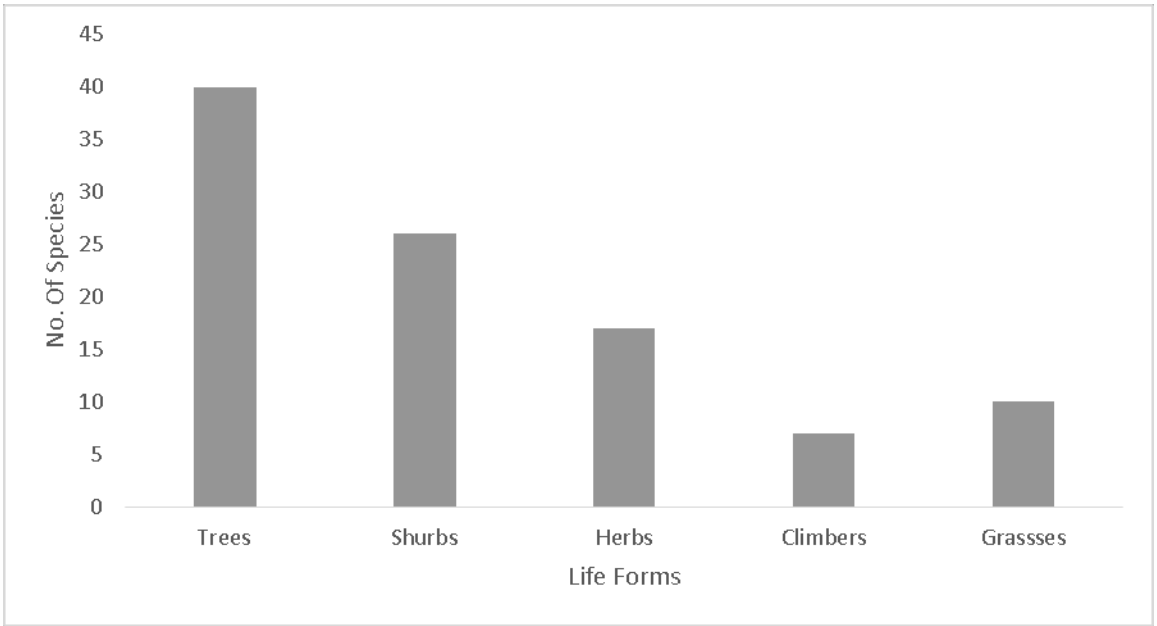
Table 3.24: List of Floristic Species in the Buffer Zone

Sl.No	Species name	Common name	Family
Trees			
1	Acacia auriculiformis	Pencile tree	Fabaceae
2	Azadirachta indica	Neem	Meliaceae
3	Acacia catechu	Khair	Fabaceae
4	Acacia leucophloea	Velamaram	Fabaceae
5	Acacia nilotica	Karu- velamaram	Fabaceae
6	Acacia planifrons	Umbrella thorn	Fabaceae
7	Aegle marmelos	Vivam	Rutaceae
8	Albizia amara	Krishna Siris	Fabaceae
9	Albizia lebebck	Siris	Fabaceae
10	Atalantia monophylla	Kattu Elumeachi	Rutaceae
11	Borassus flabelliformis	Panna-maram	Arecaceae
12	Carica papaya	Pappali	Caricaceae
13	Cassia fistula	Konnai	Caesalpinaceae
14	Cocus nucifera	Tennai	Arecaceae
15	Delonix regia	Gulmohar	Fabaceae
16	Ficus benghalensis	Alamaram	Moraceae
17	Ficus racemosa	Atthi	Moraceae
18	Ficus religiosa	Arasamaram	Moraceae
19	Gmelina arborea	Kumalaamaram	Verbenaceae
20	Lepisanthes tetraphylla	Nekota	Sapindaceae
21	Mangifera indica	Mango	Anacardiaceae
22	Melia azedarach	Malai vempu	Meliaceae
23	Morinda tinctoria	Nuna	Rubiaceae
24	Phyllanthus emblica	Nelli	Euphorbiaceae
25	Pithecellobium dulce	Kodukkapuli	Fabaceae
26	Polyalthia longifolia	Nietilingam	Annonaceae
27	Pongamia pinnata	Pungai	Fabaceae
28	Prosopis juliflora	Mesquite / Mul	Fabaceae
29	Samanea saman	Amaivagai	Fabaceae
30	Saraca asoca	Asogam	Caesalpiniaceae
31	Syzygium cumini	Naval	Myrtaceae
32	Tamarindus indica	Puli	Caesalpinaceae
33	Tectona grandis	Tekku	Verbenaceae
34	Terminalia arjuna	Marudha Maram	Combretaceae
35	Thespesia populnea	Puvarasu	Malvaceae
36	Ziziphus mauritiana	Yellanthai	Rhamnaceae

Sl.No	Species name	Common name	Family
37	Madhuca longifolia	Iluppai	Sapotaceae
38	Moringa oleifera	Murungai	Moringaceae
39	Manilkara zapota	Sappota	Sapotaceae
40	Mimusops elengi	Magizhamboo	Sapotaceae
41	Musa paradisiaca	Valzhlai	Musaceae
Shrubs			
1	Abutilon indicum	Thutti	Malvaceae
2	Aloe vera	Kathalai	Liliaceae
3	Anisomeles indica	Indian Catmint	Lamiaceae
4	Anisomeles malabarica	Peyameratti	Lamiaceae
5	Boerhaavia diffusa	Nyctaginaceae	Kagithapoo
6	Caesalpinia pulcherrima	Mayilkonnai	Caesalpinaceae
7	Calotropis gigantea	Yerukku	Asclepiadaceae
8	Carissa spinarum	Chirukila	Apocynaceae
9	Cassia auriculata	Aavaram	Caesalpinaceae
10	Datura metel	Solanaceae	Umatai
11	Dodonaea viscosa	Velari	Sapindaceae
12	Euphorbia tirucalli	Thiru- kalli	Euphorbiaceae
13	Grewia tiliifolia	Dhaman	Tiliaceae
14	Hibiscus rosa-sinensis	Malvaceae	Semparuthi
15	Ipomoea carnea	Bush morning glory	Convolvulaceae
16	Lantana camara	Unichedi	Verbenaceae
17	Opuntia stricta	Sappathikalli	Cactaceae
18	Phyllanthus emblica	Nelli	Phyllanthaceae
19	Ricinus communis	Aamanakku	Euphorbiaceae
20	Solanum pubescens	Kattusundai	Solanaceae
21	Tarenna asiatica	Rubiaceae	Thaerani
22	Tecoma stans	Thangarali	Bignoniaceae
23	Tephrosia purpurea	Kolinji	Fabaceae
24	Vitex negundo	Nochi	Verbenaceae
25	Vitex trifolia	Nili / Karu nocci	Verbenaceae
26	Wrightia tinctoria	Nilapalai	Apocynaceae
Herbs			
1	Acalypha indica	Kuppaimeni	Euphorbiaceae
2	Achyranthes aspera	Nai-uruvi	Amaranthaceae
3	Amaranthus tricolor	Sirukkeerai	Amaranthaceae
4	Amaranthus viridis	Kuppaikeerai	Amaranthaceae
5	Boerhavia diffusa	Mookkaratti	Nyctaginaceae

Sl.No	Species name	Common name	Family
6	Boerhavia erecta	Erect Spiderling	Nyctaginaceae
7	Cassia occidentalis	Pei- avarai	Caesalpinaceae
8	Catharanthus roseus	Nithyakalyani	Apocynaceae
9	Cleome viscosa	Naivelai	Cleomaceae
10	Commelina benghalensis	Kanavaazhai	Commelinaceae
11	Leucas aspera	Lamiaceae	Thumbai
12	Phyllanthus niruri	Phyllanthaceae	Keelzhaneeli
13	Sida acuta	Common Wire weed	Malvaceae
14	Sida cordifolia	Nila –thuthi	Malvaceae
15	Sida rhombifolia	Chitramutti	Malvaceae
16	Tridax procumbents	Vettukkaayathalai	Asteraceae
17	Waltheria indica	shembudu	Sterculiaceae
Climbers			
1	Abrus precatorius	Kundumani	Fabaceae
2	Asparagus racemosus	Thanneervittan	Liliaceae
3	Cissus quadrangularis	Perandai	Vitaceae
4	Clitoria ternatea	Butterfly Pea	Fabaceae
5	Coccinia grandis	Kovai	Cucurbitaceae
6	Jasminum angustifolium	Kattumalligai	Oleaceae
7	Ziziphus oenoplia	Kottai-ilanthai	Rhamnaceae
Grasses			
1	Cenchrus ciliaris	Kolukkattai-pullu	Poaceae
2	Chloris barbata	Chevvarakupul	Poaceae
3	Chloris bournei	Peria kuruttu pul	Poaceae
4	Chloris inflata	Kodai pullu	Poaceae
5	Chloris montana	Swollen finger grass	Poaceae
6	Chrysopogon fulvus	Cholappullu	Poaceae
7	Cymbopogon	Kanam pullu	Poaceae
8	Cynodon dactylon	Arugam pullu	Poaceae
9	Cyperus rotundus	Korai	Cyperaceae
10	Dactyloctenium aegyptium	Crow-foot grass	Poaceae

Figure 3.17: Flora species in the Buffer Zone



3.5.2 FAUNA:

Methodology: Both direct and indirect observation methods were used to survey the fauna. Point Survey Method was used to study the Bird diversity. Besides, discussion with local villagers Collection secondary data from Government records, published reports as well as through discussion with Forest officials, knowledgeable public were used for the study.

Other than domestic animal, no wild animals are reported in and around the lease area. There is no Schedule-1 species in and around core zone.

Kodikanal wildlife sanctuary is located 8.2 Km from the SW direction.The Eco-sensitive zone of Kodaikanal wildlife Sanctuary as per Final Notification S.O 412 (E) dated 23.01.2010 of MOEF & CC is 7.2 Kms from the lease boundary and as such this project does not attract NBWL clearance. In the interior Sanctuary mammals like Tiger (Panthera tigris), Indian gaur (Bos gaurus), Elephant (Elephas mazimus), Wildboar (Sus scrofa), common Langur (Semnopithecus) etc, birds like Red-whiskered bulbul (Phycnonotus jocous), common Kingfisher (Alcedo atthis), Bebra Sparrow-hawk (Virgatus besra) etc. amphibians like common Asian Toad (Bufo melanostictus), Indian Skipper Frog (Euphlyatis cyanophlyetis), etc. are reported. However, these animals are located in the interior elevated land. There is no incidence of spotting of any wild animal in the plains in and around the lease area. The list of fauna within the study area is given in Table No – 3.25.

Table 3.25: List of Fauna in the Buffer Zone plains

S.No	Common Name	Scientific name	IWPA, Schedule
Mammals			
1	Common Indian Hare	Lepus ruficaudatus	IV
2	Indian Palm squirrel	Funambuus palmarum	IV
3	Indian Grey Mongoose	Herpestes edwardsii	II
Birds			
1	Black Drongo	Dicrurus macrocercus	IV
2	Cattle Egret	Bubulcus ibis	IV
3	Common Babbler	Turdoides caudatus	IV
4	Common Crow	Corvus splendens	V
5	Common Kingfisher	Alcedo atthis	IV
6	Common Myna	Acridotheres tristis	IV
7	Common Quail	Coturnix coturnix	IV
8	House Sparrow	Passer domesticus	IV
9	Indian Cuckoo	Cuculus micropterus	IV
10	Little Cormorant	Phalacrocorax niger	IV
11	Little Egret	Egretta garzetta	IV
12	Purple-rumped Sunbird	Nectarinia zeylonica	IV
13	Red-vented Bulbul	Pycnonotus cafer	IV
14	Rose-ringed Parakeet	Psittacula krameri	IV
15	Spotted Dove	Streptopelia chinensis	IV
Reptiles			
1	Common Indian krait	Bungarus caeruleus	II
2	Rat Snake	Ptyas mucosa	II
3	Garden Lizard	Calotes versicolar	IV
Amphibians			
1	Common Indian toad	Bufo melanostictus	IV
Butterfly			
1	Lime butterfly	Papilio demoleus	IV
2	Common crow	Euploea core	IV
3	Small grass yellow	Eurema brigitta	IV

3.6 HYDROGEOLOGICAL STUDY:

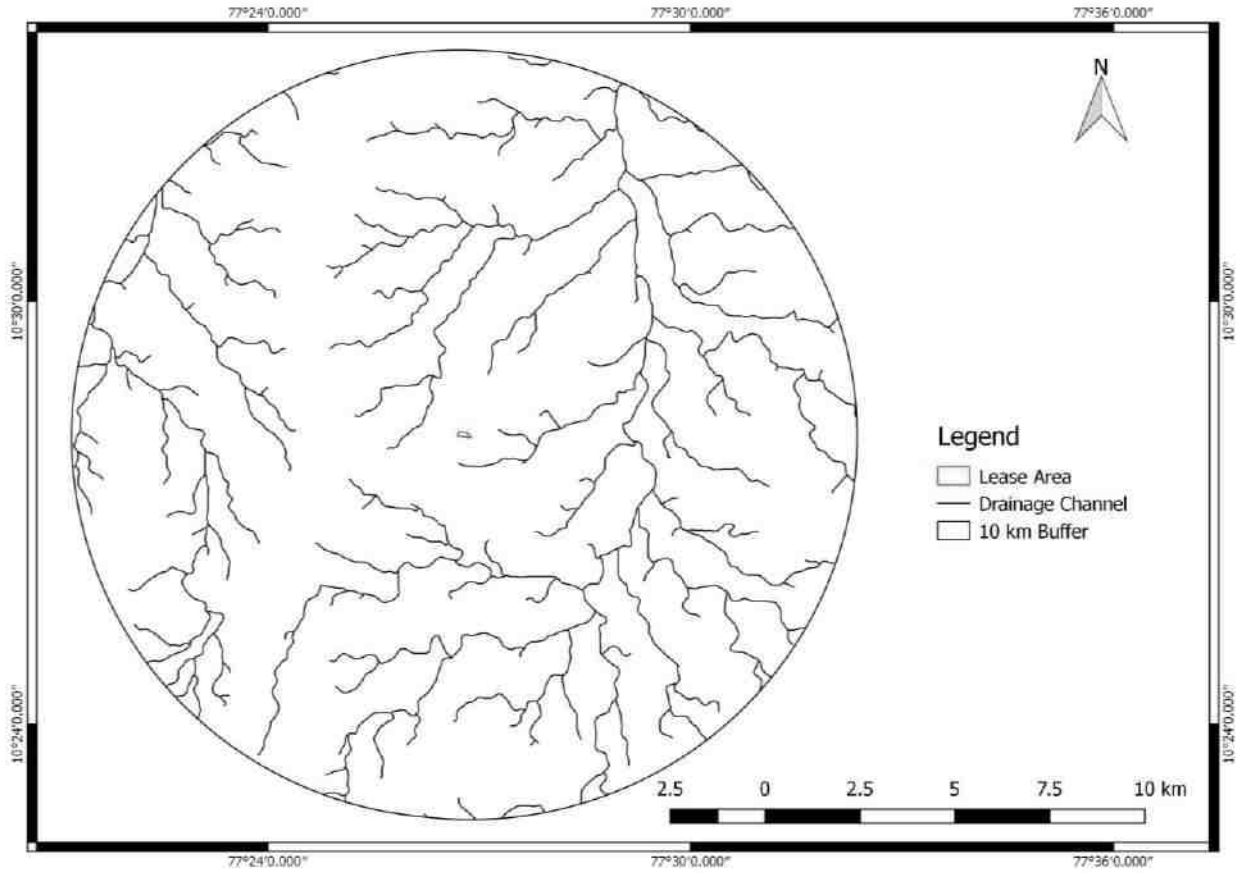
This section delves into the study of the hydrogeological scenario of the study area to evaluate the impact of mining activities on the nearby areas. The study area is located in Chinnakalayamputhur Village in Palani Taluk is considered to understand the nature of the general hydrogeological conditions of the area.

3.6.1 PHYSIOGRAPHY AND DRAINAGE:

Physiography: The area applied for mining lease is a gentle plain terrain.

Drainage: There is no major water body in the core zone. The drainage map prepared from the survey of India topographic maps shows the presence of few streams running in a dendritic pattern.

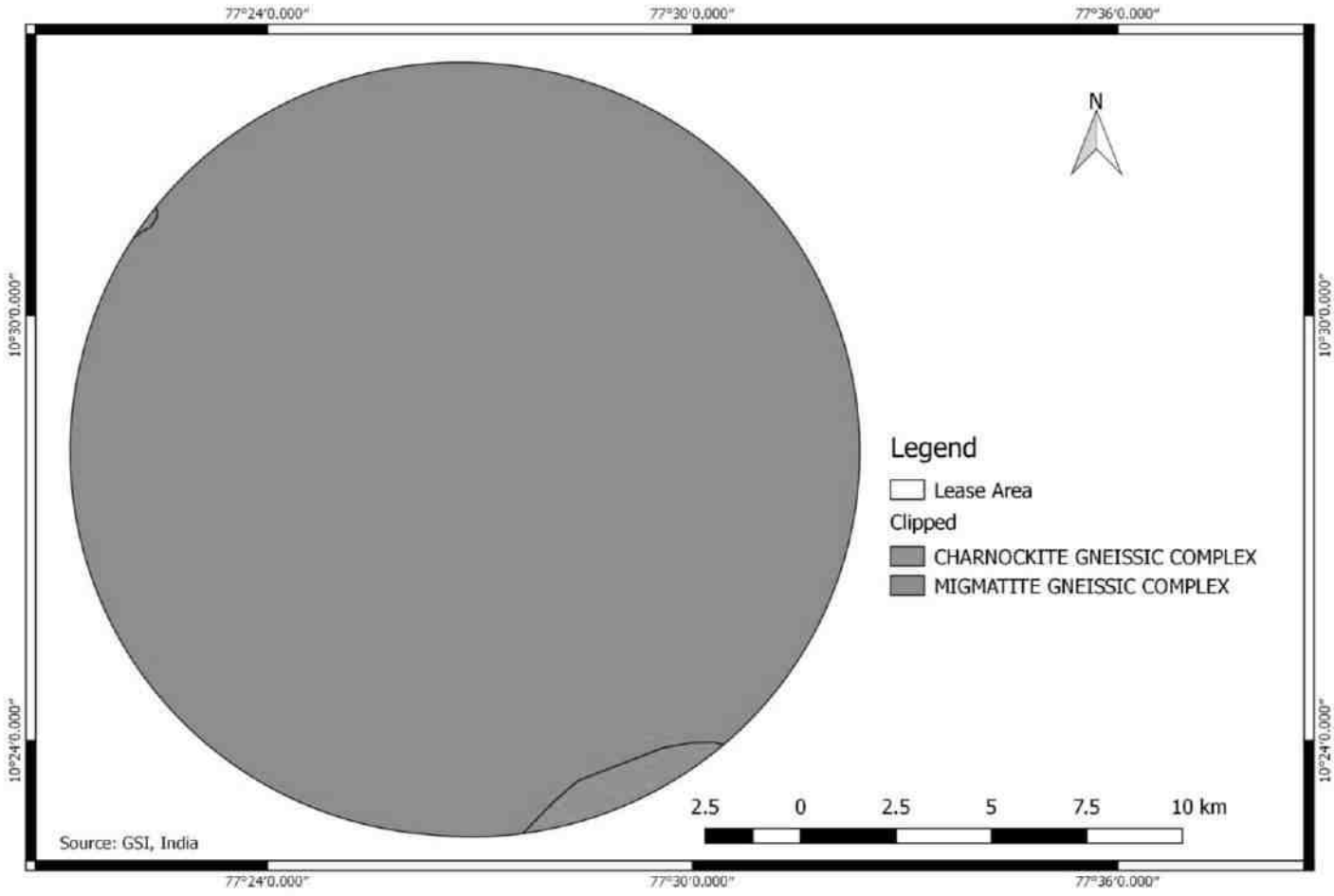
Figure 3.18: Drainage Map



3.6.2 GEOLOGY AND GEOMORPHOLOGY

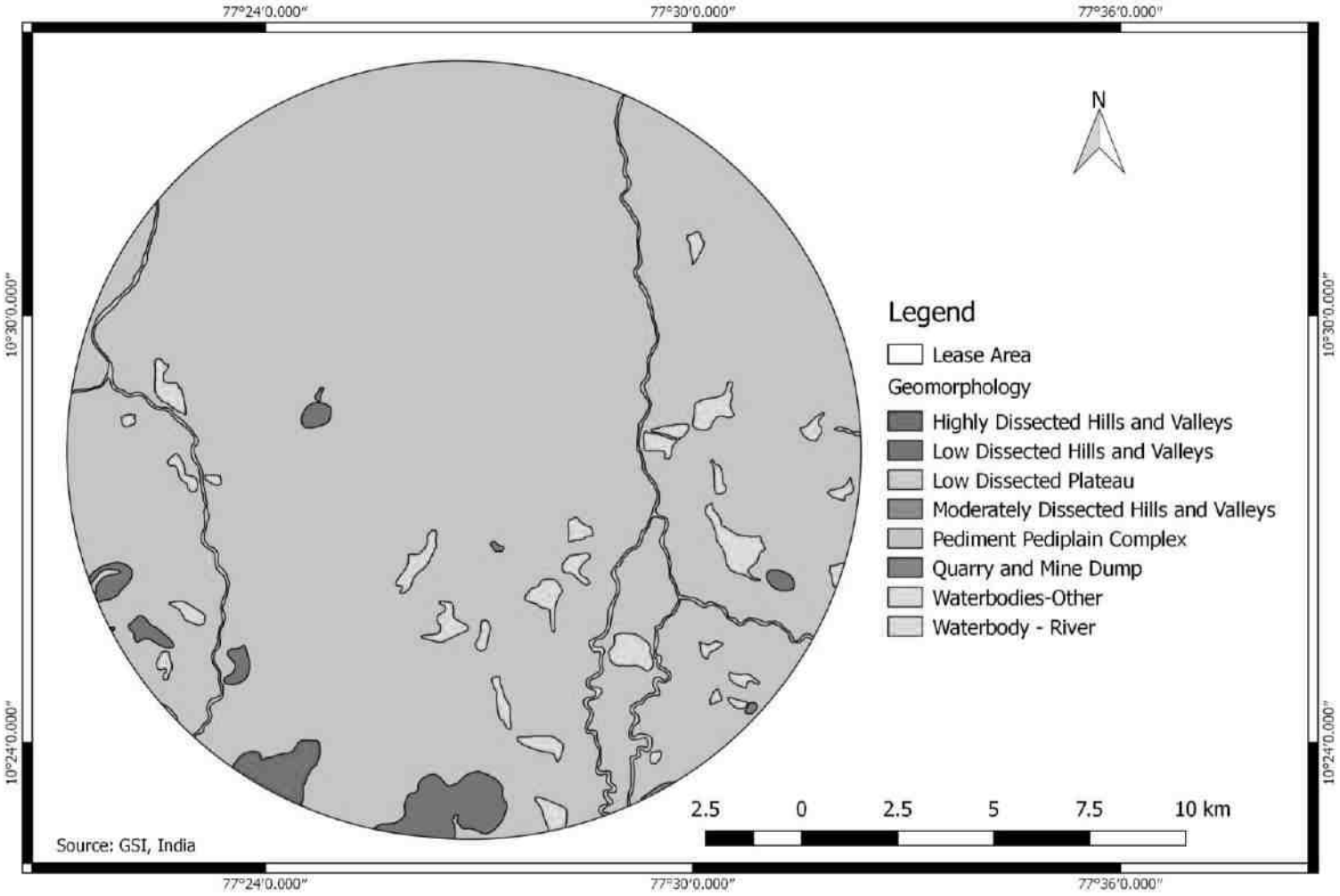
Geology: The type of rock formation in the core and buffered zone is composed majorly of Migmatite Gneissic complex. The lease area falls under Migtmatite Gneissic complex category.

Figure 3.19: Geology Map



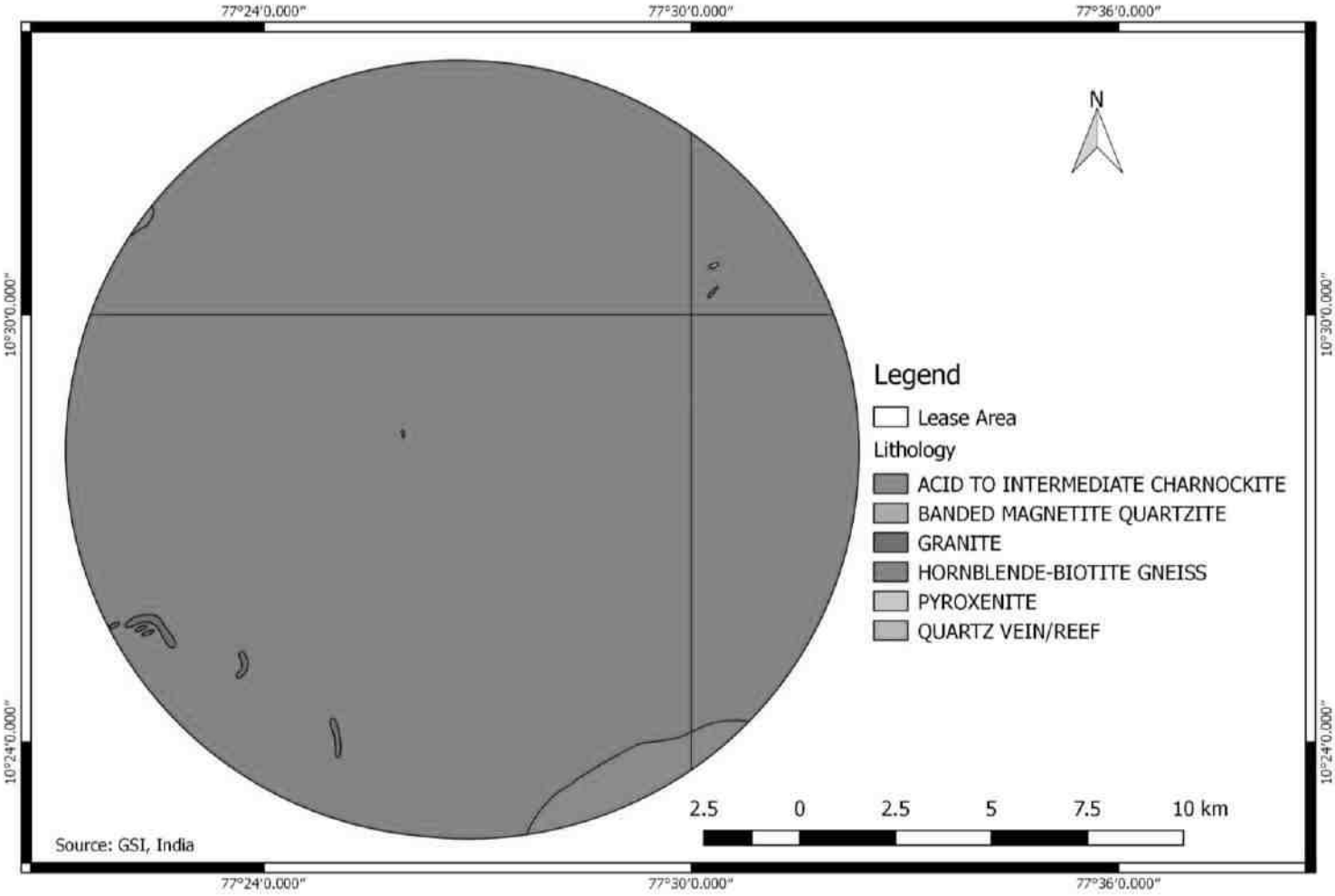
Geomorphology: The geomorphology map of the study derived from the satellite imagery using remote sensing and GIS technique. Predominantly the buffer zone is dominated by Pediment Pediplain complex, and it is the same catergory that the lease area also falls under.

Figure 3.20: **Geomorphology Map**



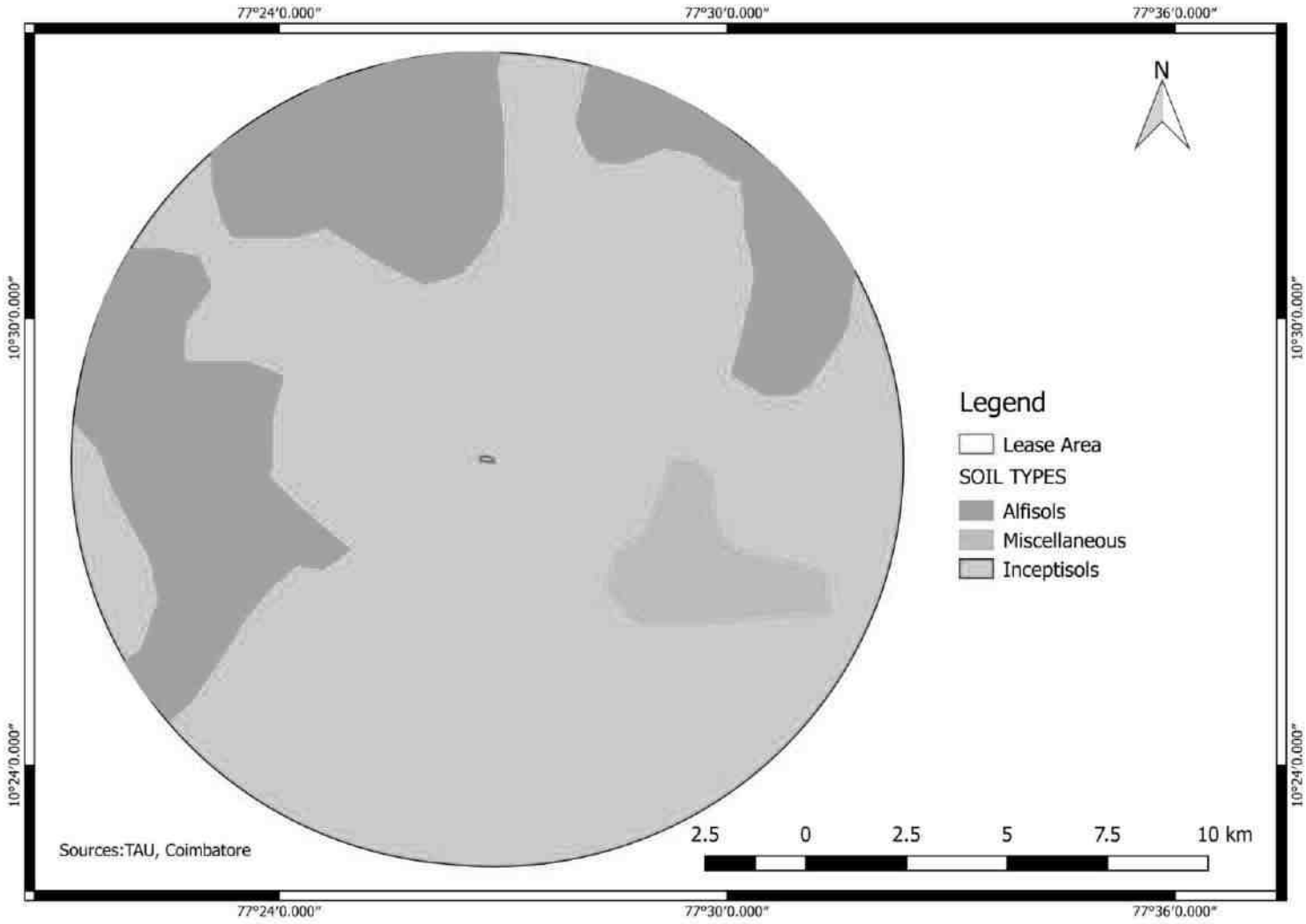
Lithology: The study area is mainly dominated by Hornblende-Biotite Geneiss. The lithology map has been provided below.

Figure 3.21: Lithology Map



Soil: The study area is characterized by Inceptisol & Alfisols. The project area is dominated with Inceptisol type of soil.

Figure 3.22: Soil Map



3.6.3 WATER TABLE OF THE AREA:

Based on the depth to water level data obtained from the India-WRIS, Department of Water Resources, Ministry of Jal Shakti for Palani Block, Dindigul District, Tamil Nadu the following is observed.

Table 3.26: General Trend of Depth to Water Level for Palani Block

Year	Depth to Water Level (m bgl)		Wells Monitored	
	Pre-Monsoon	Post-Monsoon	Pre-Monsoon	Post-Monsoon
2015	2.74	-	2	-
2016	3.165	3.4	2	2
2017	5.64	2.375	2	2
2018	3.15	2.635	2	2
2019	4.295	4.725	2	2
2020	-	6.795	-	2

The premonsoon and post monsoon water levels are depicted in Figure No.3.23, and 3.24 and they indicate that the depth to water level in project area ranges between 2.0 to 10.0 m bgl during the pre-monsoon season(April) and 2.0 to 10.0 m bgl during the post monsoon season (November).

Figure 3.23: Pre-Monsoon Water Level

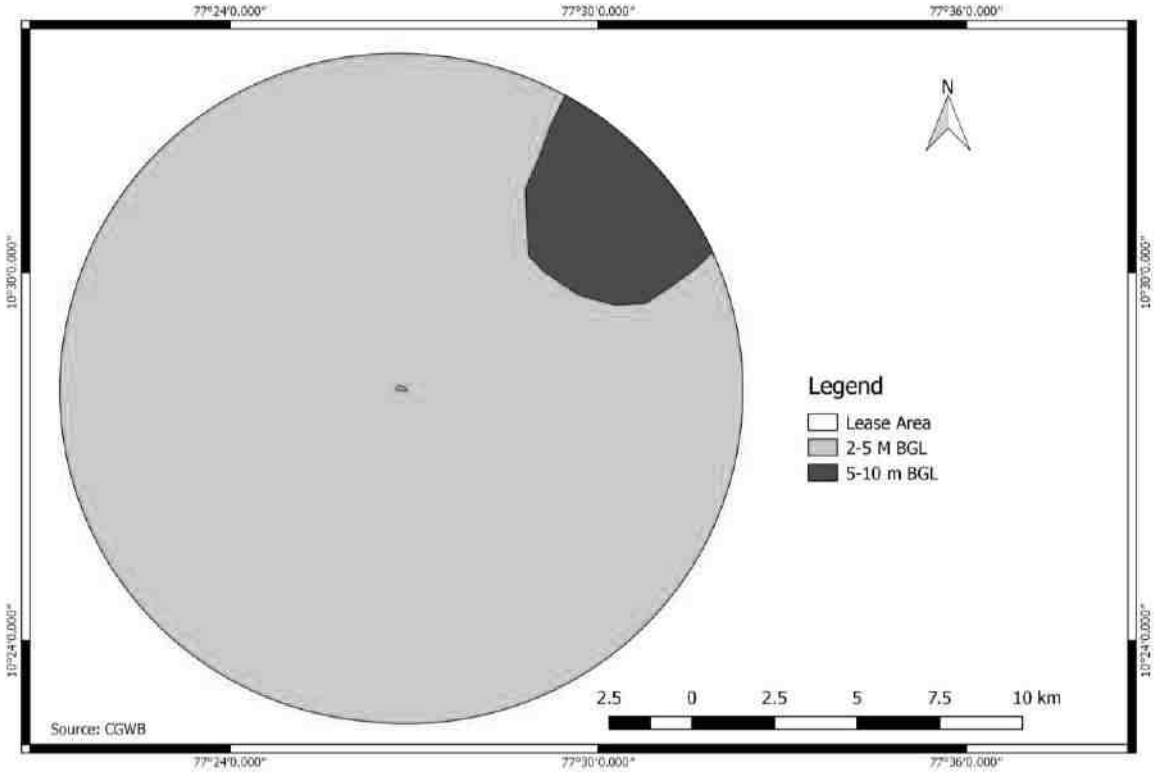
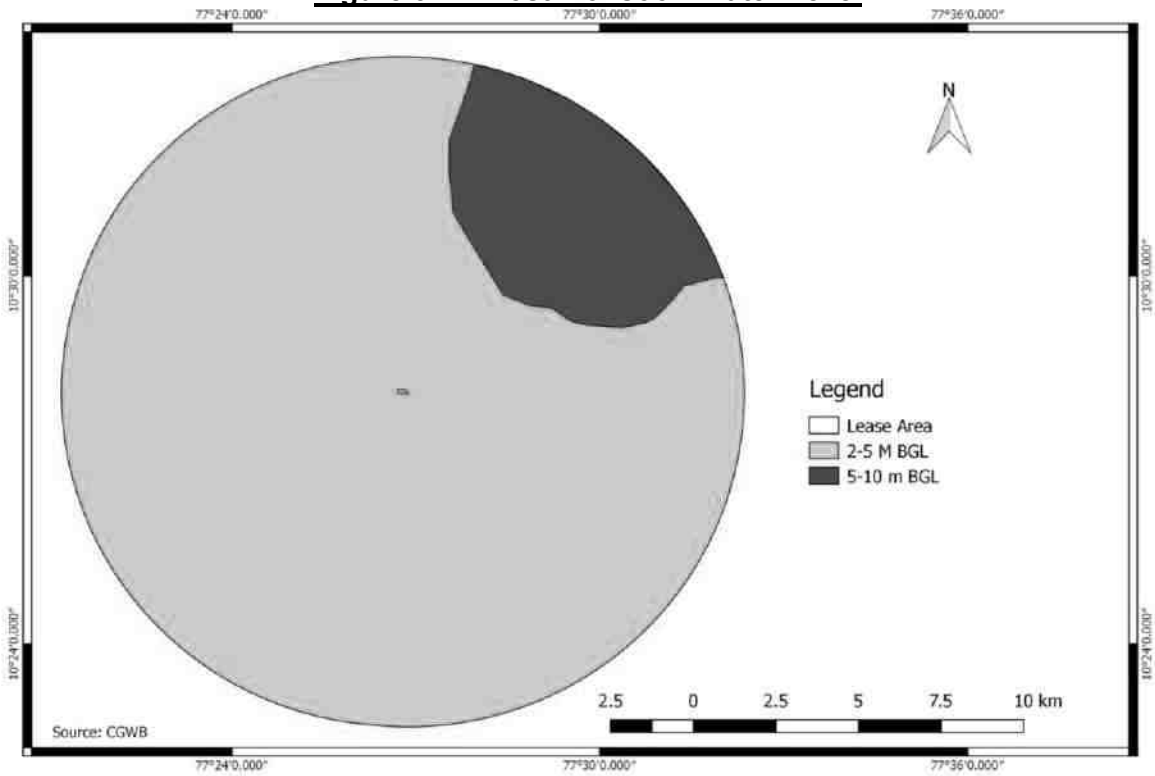


Figure 3.24: Post Monsoon Water Level



Field investigation:

Study of the area shows that the sub-surface formations reveal less of soil with low recharge potentials. Subsequently hard and massive formations of rock are found.

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 are available mainly after post monsoon and it reduces during summer necessitating only dry crops cultivation. Bore wells are as deep as 300 ft also and it reflects that the yield is only better at deeper water levels.

Based on the available information and the geophysical investigations it is concluded that the project area is considered to poor groundwater potential up to 50m. Besides, the mining area consists of hard compact rock, no major water seepage within the mine is expected. There is no water seepage noticed in to the already quarried pits situated nearby the proposed quarry area. Hence, the quarrying rough stone up to the proposed depth may not have any adverse impact in the area over ground water conditions.

Rain water collected in the tanks in the region acts as a good source of water during post monsoon. 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 - IV

ANTICIPATED ENVIRONMENTAL IMPACTS & MITIGATION MEASURES

CHAPTER 4
ANTICIPATED ENVIRONMENTAL IMPACTS AND MITIGATIONMEASURES

4.1 GENERAL

In this project Semi – Mechanized Open Cast mining will be carried out to quarry out Rough Stone and Top soil. The identified impacts due to this mine during mining and associated activities have been studied in relation to various environmental components like Air, water, noise, vibration, land, transport etc., and the details of the same are elaborated in this chapter.

The impact assessment and management plan is studied for the peak production of the mine lease period and the entire area of quarry operation and can be construed as applicable for the entire lease period.

4.2 AIR ENVIRONMENT:

4.2.1 IMPACTS DUE TO PROJECT OPERATION:

The existing ambient air quality in the area has been described in Chapter-III. The proposed mining and allied operations may cause deterioration of air quality due to pollution arising from the project operation if prompt care is not taken. The principal sources of air pollution in general due to mining and allied activities will be:

- Excavation of material.
- Movement of HEMM such as Excavators, tippers etc.
- Loading and unloading operation
- Transportation

Besides, Gas emission will occur as a result of operation of diesel driven mining equipment, compressors, transporting vehicles, etc.

Particulate matter smaller than 10 microns, referred to as PM_{10}, can settle in the bronchi and lungs and cause health problems like Bronchitis, Emphysema, Bronchial Asthma, Irritation of mucus membranes of eyes, etc. Particles smaller than 2.5 micrometers ($PM_{2.5}$), tend to penetrate into the lungs and very small particles (<100 nanometers) may pass through the lungs to affect other organs.

Besides the above mentioned fugitive dust emissions, atmospheric pollution can occur as a result of emission of SO_2, NO_x, CO etc., from diesel driven mining equipment, generator sets,

etc. Larger suspended particles are generally filtered in the nose and throat and do not cause problems. Higher concentration of SO2, NOx, CO may cause some health effect on the human beings exposed to it. In case of this mine, the following measures will be adopted to control impact on the air quality due to mining operations in the lease area:

Table4.1: Impact and Mitigation Measures – Air Environment

S.No	Activity	Consequence	Mitigation Measures
1	Drilling	Dust Emanation	Usage of Drill bits in good condition
			Covering of drill holes with wet cloth
			Usage of sharp drill bits for drilling of holes.
			Provision of dust filters / mask to workers working at highly dust prone and affected areas.
2	Blasting	Instantaneous dust emanation	Well-designed blasting parameter, effective stemming to achieve optimum breakage occurs without generating fines.
			Use of appropriate explosives for blasting and avoiding overcharging of blast holes.
			Avoiding blasting during high wind periods where the fine dust is carried out away easily affecting the ambient air quality.
			Use of controlled blasting techniques with Nonel to keep the dust generation, noise as well as vibration level within the prescribed limits.
3	Excavation and Loading	Dust emanation, Gaseous Emission	HEMM will be operated as per the manufacturer's guidelines
			Enclosures for operator cabin.
			Imparting sufficient training to operators on safety and environmental parameters.
			Proper maintenance of hauling equipments.
			Avoiding overloading of dumpers.
4	Transportation	Dust emanation, Gaseous Emission	Regular wetting of transport road using mobile water tanker.
			Proper maintenance of haul road and other roads
			Setting up of tyre wash facility in the transport road.
			Avoiding overloading of tippers
			Covering of loaded tippers with tarpaulins during transportation
			Vehicular emissions will be controlled through regular and proper preventive maintenance schedules and emissions tests are done with diesel smoke meter equipment to ensure emission values.
5	Others	Dust emanation, Gaseous Emission	Development of greenbelt / barriers around mine in the safety zone and carrying out plantation within the lease area.
			50m safety distance has been left for the power line adjacent to the eastern side of the lease area. Tin sheet will be erected along the eastern side of the lease area. Green netting will be carried out around the lease periphery on all other sides.

Due to adoption of all these measures, no major impact on air quality is envisaged due to this proposed opencast mining operation.

Considering that the quantum of production is less, only 1 excavator, 4 tippers will be engaged. These equipments will be properly and regularly maintained. Besides, as mentioned earlier, 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 500 number of plants will be planted in and around the lease area.

The impact on air quality due to the proposed project is estimated using AERMOD View Gaussian Plume Air Dispersion Model developed by Lakes Environmental Software which is based on steady state Gaussian plume dispersion. Details of the modeling study / estimation including the modeling technique and post project air quality values are elaborated in the following paras.

4.2.2 AIR QUALITY IMPACT PREDICTION:

The model simulations are done for the air pollutant arising from the mining operations, namely, PM_{10}, $PM_{2.5}$. **Ground Level Concentration** (GLC) have been computed using hourly meteorological data.

Table4.2: Emission Sources

ACTIVITY	SOURCE TYPE
A. Mining operations	Open pit
B. Transportation	Line

4.2.2.1 Emission Factors

Quantification of particulate emissions has been carried out by the emission factor technique. Emission factor is a statistical average of the rate at which a pollutant is released during an activity. This factor when multiplied by the level of that activity in a given situation will give the overall effect. Fugitive emissions have been predicted by using standard equations given and suggested by AP-42, USEPA(1998), Coal S&T Project and for mining & allied activities and other factors. The modeling is done for the peak production to know the worst scenario. The details of the emission factors used for the same is provided below:

Table4.3: Emission Factors

S.No	Activity	PM10	PM2.5	Unit
1	Ore Loading	1.5×10^{-3}	2.1×10^{-4}	Kg/T
2	OB Loading	1.4×10^{-4}	1.5×10^{-5}	Kg/T
3	Hauling inside lease area	0.19	0.019	g/VKT
4	Drilling	0.1	0.04	Kg/hole

4.2.2.2 Emission Rates:

Based on the emission factors, after adopting necessary control measures like dust suppression, Proper maintenance of HEMM, using better quality diesel, using latest equipment, proper maintenance of roads, etc. the expected emission rate due to various operations in this project is calculated and is given below:

Table4.4: Emission Rate

ACTIVITIES/POLLUTANTS	PM_{10} (g/sec)	$PM_{2.5}$(g/sec)
Ore Loading	0.06	0.01
Drilling	0.18	0.07
Hauling inside lease area	0.23	0.03
Total	**0.47**	**0.11**

A. ***Emission Source Coordinates:***The center of mine was assumed (0, 0) in the mathematical modeling.

B. ***Meteorological Conditions Used In Predictions:*** The hourly meteorological data has been generated for Summer Season (March 2022 to May 2022) and the same has been used in the predictions.

4.2.2.3 Results and Discussions

The results of the Peak GLC's for various environmental parameters with control measures are given below:

Table4.5: Peak Incremental Concentration

S.no	Parameters	Peak incremental concentration µg/m^3
1	**PM_{10}**	8.0
2	**$PM_{2.5}$**	1.9

It is observed that the peak incremental concentration for PM_{10}, $PM_{2.5}$ occurring very near the source. At away from the source the values are getting reduced due to dispersion effects. The Isopleths of PM_{10}, $PM_{2.5}$ concentrations for with control measures scenario have also been drawn and these are given in **Figure No.4.1 and 4.2.** The incremental and predicted concentrations at the locations of ambient air quality have been discussed in the following section.

Figure 4.1: Isopleth of GLC Prediction for PM_{10}

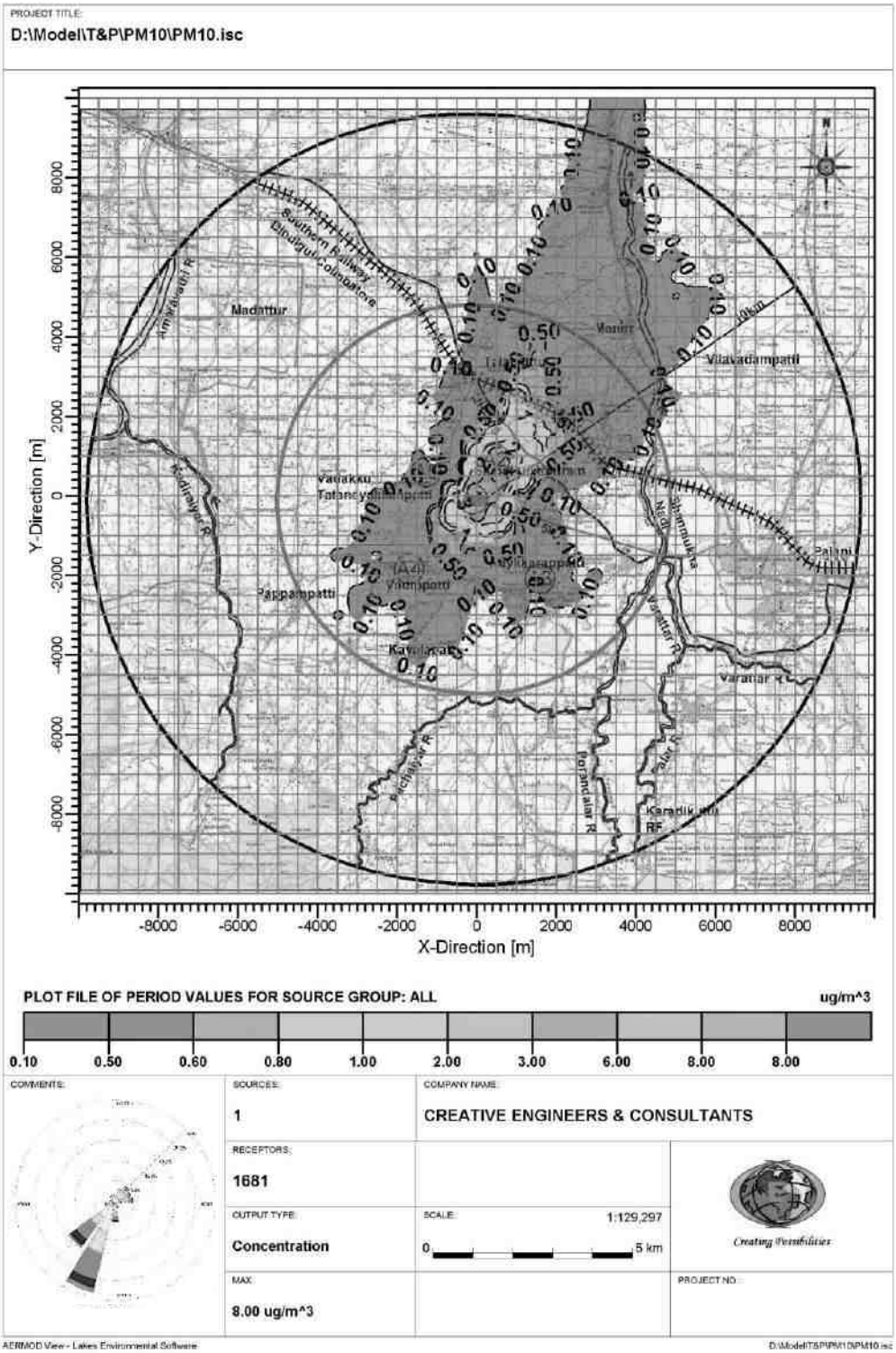
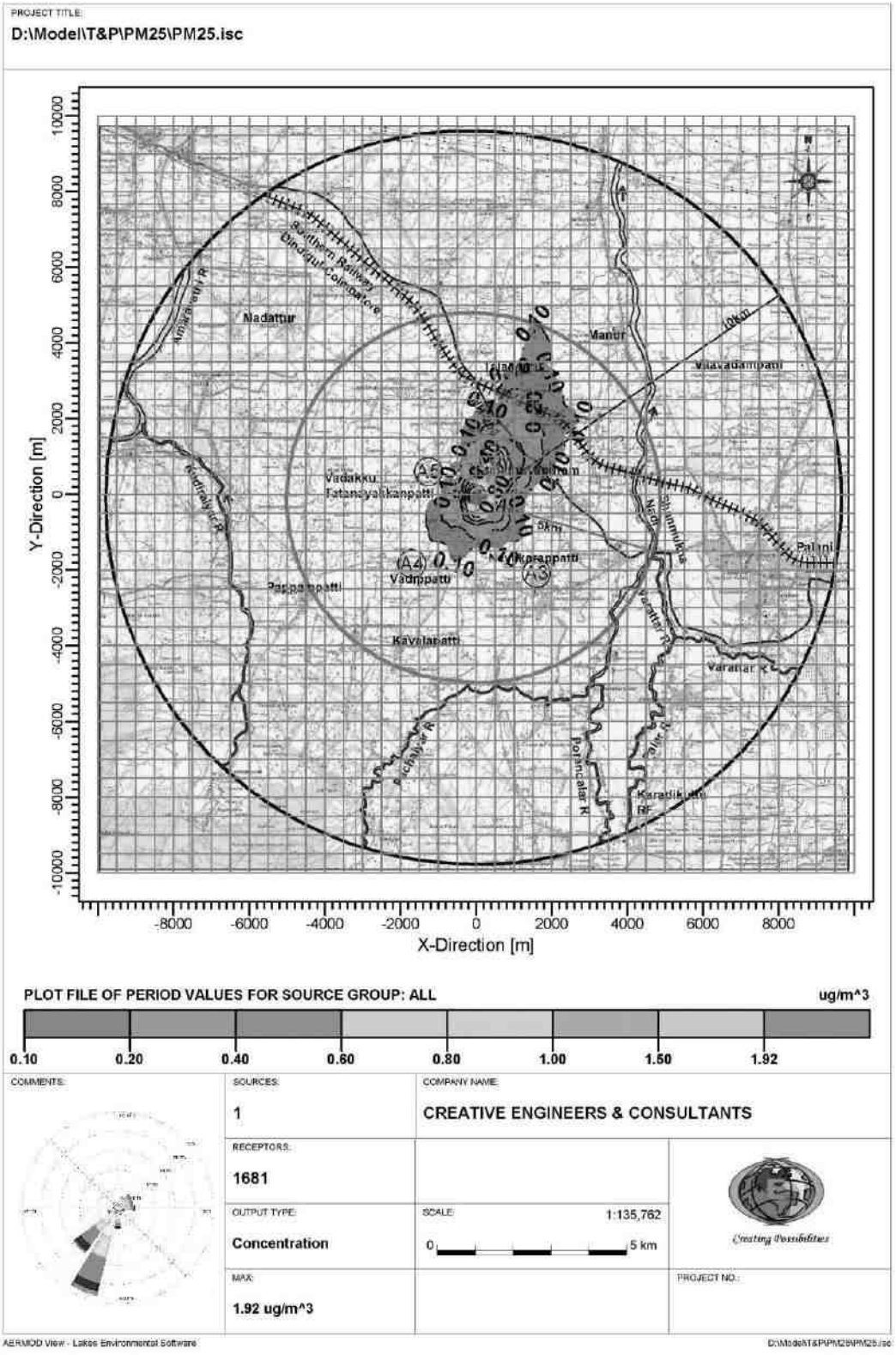


Figure 4.2: Isopleth of GLC Prediction for $PM_{2.5}$



4.2.2.4 Predicted Ambient Air Quality:

The post project Concentrations of PM_{10}, $PM_{2.5,}$ (GLC) (base line + incremental) after adopting necessary control measures is given in **Table No - 4.6 to 4.7.**

Table4.6: Concentrations Of PM_{10} after Project Implementation

Values in μg/m³

S. No	Location	Background Concentration	Predicted Incremental Concentration	Post Project Concentration	Statutory Limits
1	A1-Near Mine Lease Area	50.2	8.0	58.2	-
2	A2- Samathuvapuram Village	50.9	2.0	52.9	100
3	A3- Neykarapatti Village	62.5	<1.0	63.5	
4	A4- R.Vadipatti Village	56.5	<1.0	57.5	
5	A5- Tatanayakkanpatti Village	52.5	<1.0	53.5	

Table4.7: Concentrations Of $PM_{2.5}$ after Project Implementation

Values in μg/m³

S. No	Location	Background Concentration	Predicted Incremental Concentration	Post Project Concentration	Statutory Limits
1	A1-Near Mine Lease Area	22.6	1.9	24.5	-
2	A2- Samathuvapuram Village	23.4	1.0	24.4	60
3	A3- Neykarapatti Village	29.1	1.0	30.1	
4	A4- R.Vadipatti Village	26.3	1.0	27.3	
5	A5- Tatanayakkanpatti Village	24.2	1.0	25.2	

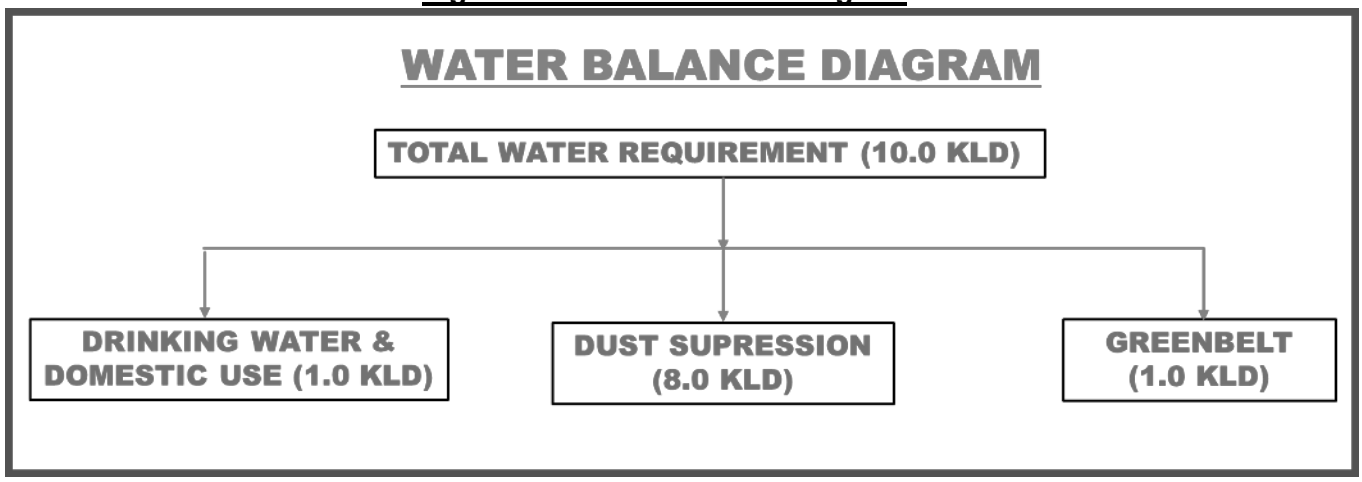
It can be seen that the resultant added concentrations with baseline figures even at worst scenario, show that the values of ambient air quality with respect to PM_{10} are in the range of 52.9μg/m3 to 63.5μg/m3 and with respect to PM2.5 are in the range of 24.4 μg/m3 to 30.1μg/m3 which are within the statutory limits in each case.For preservation of environment in this mine strict enforcement of management schemes and regular air quality monitoring will be undertaken for taking corrective actions, as needed. By adopting the effective implementation of all the mitigative measures, no adverse impact on Air quality due to the mining operation in this lease area is expected.

4.3 WATER ENVIRONMENT:

4.3.1 WATER REQUIREMENT:

The total water requirement for this project will be 10.0 KLD comprising1.0 KLD for drinking water and domestic use, 8.0 KLD for dust suppression and1.0 KLD for greenbelt.The water will be sourced initially 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 No 4.3.**

Figure 4.3: Water Balance Diagram



4.3.2 SOURCES OF WATER POLLUTION:

The existing water environment showing water quality at different sampling stations in the area has been described in Chapter-III.

Direct impact on human beings due to poor water quality consequent to mining operation can lead to various water borne diseases like diarrhea, jaundice, dysentery, typhoid, etc. Besides, the polluted water may not be useful for animal or human consumption, vegetation and may affect aquatic life, if effluents are not properly treated to remove the harmful pollutants.

The major sources of water pollution normally associated due to mining and allied operations are:

a. Domestic effluent.
b. Washouts from stockpile if any.
c. Disturbance to drainage course in the project area
d. Generation of mine pit water pumped out from deeper workings if any.

4.3.3 TREATMENT SCHEME:

A. Generation of domestic effluent:

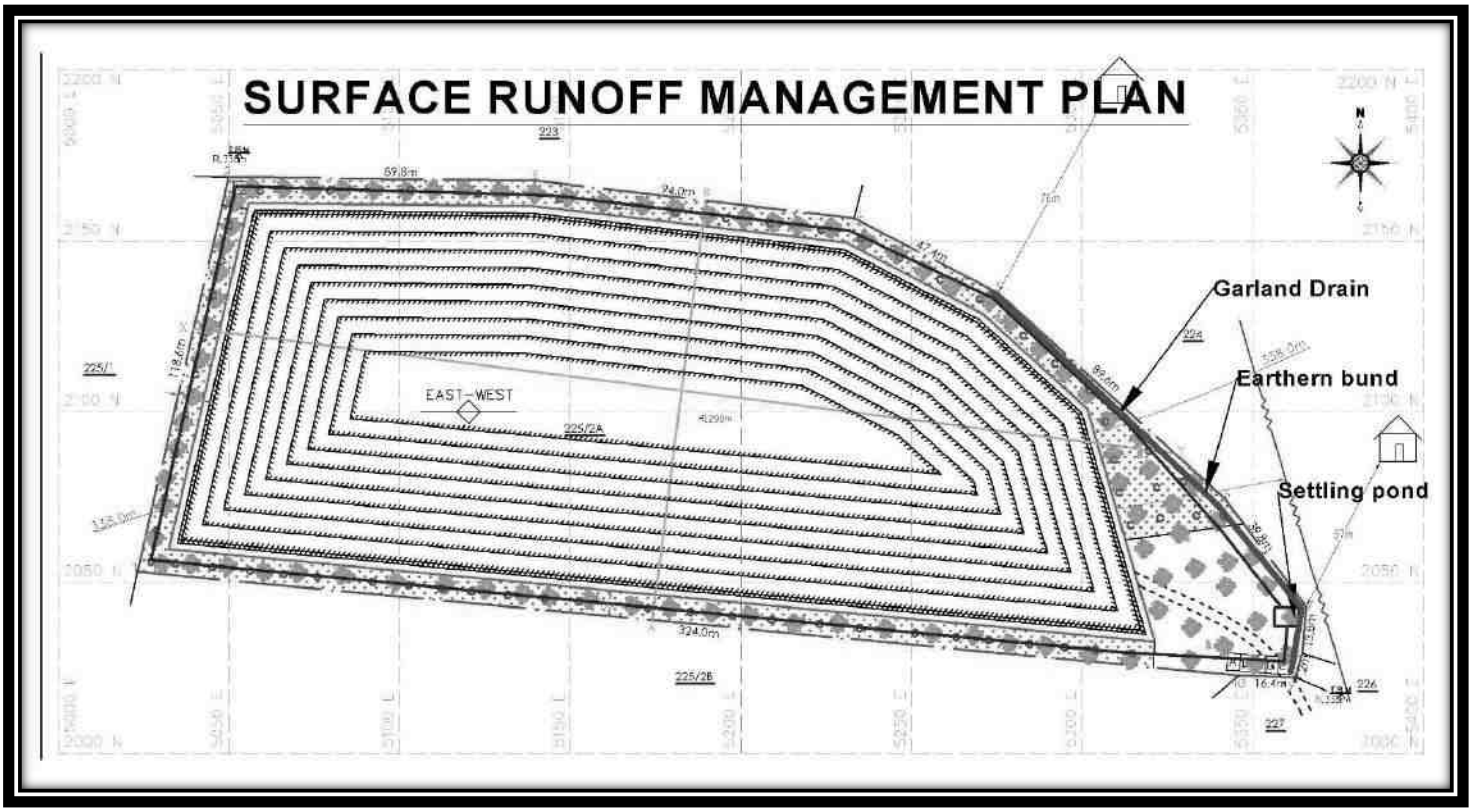
The domestic sewage to be generated from the project will be collected in septic tank with soak pits.

B. Washouts from overburden, ore stockpile, etc.

Since the entire material from the quarry face will be directly dispatched to the consumers, there will not be any stockpiles. There are no waste dumps in this quarry. As such there will not be any wash out due to stock pile or waste dumps.

The rain water falling in the quarry will be harvested in the sump at the lowest level of the quarry. This sump will act as a settling pond to prevent solids escaping along with discharge, before outlet. etc. Towards surface runoff management, agarland drain of length 800m will be constructed around the quarry and will be connected to a settling pond with silt traps. The supernatant clear water from the settling pond will be flow to the downstream users. The surface runoff management structures diagram is given in **Figure No 4.4.**

Figure 4.4: Surface Runoff Management Structures



C. Disturbance to drainage courses

There is a drainage channel originating on the south eastern side of the lease area at a distance of 55m from the lease area. There is no proposal to discharge any effluent into this water body. No major impact is envisaged on the nearby water bodies due to project operations.

D. Generation of mine pit water pumped out from deeper workings if any.

The occurrence and movement of groundwater in hard rock formations are restricted to the porous zones of weathered formations and the open systems of fractures, fissures and joints. Generally, in hard rock regions, occurrence of weathered thickness is discontinuous both in space and depth. Hence recharge of groundwater in hard rock formations is influenced by the intensity and depth of weathering. In the nearby region, the formations are compact with less intergranular porosity and fractures leading to less permeability and transmissivity values and as such the ground water level in this area is deep from surface. The mining area consists of hard compact rock, hence no major water seepage within the mine is expected from the periphery.The ultimate pit depth of mining is 48m. The ground water table in this area is below this level. Hence, ground water intersection in not envisaged and ground water will not be affected appreciably due to the quarrying operation. Nearby mine workings also does not show any major seepage. As mentioned earlier, the rainfall will be collected in the mine floor sump and advantageously used. Excess water if any in the sump will be pumped to settling pond for downstream users.

4.3.3.1 STAGE OF GROUNDWATER DEVELOPMENT

Details of hydrological scenario of the study area were given in para 3.6, Chapter – III. The groundwater resource data of Dindigul district was obtained from the data provided in the technical report of the National Water Mission, Ministry of Jal Shakti, Department of Water Resource – Notes on Dindigul District.

Table4.8: Ground Water Resources Estimation– Palani Taluk (Ha-m)

Net Groundwater Availability	Existing Gross Draft for Irrigation	Existing Gross Draft for Domestic and industrial water supply	Existing Gross Draft for all uses	Stage of Ground water Development (%)	Category of Block
2179.58	985.60	106.28	1091.88	50	Safe

From the table it is seen that the stage of groundwater development of Palani where the study area falls is 50%. In view of this, this area can be categorized as 'Safe' from ground water development point of view. Thus there is scope for further ground water development.

4.3.4 REDUCING WATER CONSUMPTION OVER THE YEARS:

4.3.4.1 GENERAL METHODS:

Use of water will be monitored and used to the minimum required. Awareness will be spread to the employees about the importance of water conservation. Tap and showers will be turned off immediately after use and any leaks will be monitored and immediately controlled. Water requirement for greenbelt and dust suppression can be reduced by choosing the native plants/trees species with low water requirement and which can sustain in such conditions for greenbelt/ plantation and also optimum usage to the required minimum. While the dust suppression itself is an important method of pollution control for air pollution due to dust, the water consumption will be monitored strictly. The water tanker will be examined for any sources of leaks and if found will be immediately sealed so that water can be utilized for dust suppression effectively without loss.

4.3.4.2 RAINWATER HARVESTING PLAN

Since the lease proximate areas are with less water potential and the rainwater is the major source for replenishment of ground water, effective rainwater harvesting and other water augmentation measures are proposed in this project.

a) Development of garland drain around the quarry connected to settling tank.
b) Cleaning of drain periodically to prevent siltation
c) The supernatant clear water from the settling pond will drain into the nearby drainage.
d) Utilizing the rainwater harvested in the mine pit to meet the water requirement of the project.
e) Excess water, if any in consultation with local villagers and in line with government practices shall be provided to the downstream users.

4.4 NOISE AND VIBRATION:

4.4.1 NOISE ENVIRONMENT:

The ambient noise levels in the study area have been discussed in Chapter - III. The data shows that the existing noise levels are within statutory tolerable limits. The impact prediction and control measure for noise environment due to mining and allied activities is described below:

4.4.2 IMPACT PREDICTION DUE TO NOISE:

Noise is one of the inevitable causes of pollution in mining operations, largely due to the extensive mechanization adopted. Besides, other operations such as drilling, blasting, movement of vehicles, etc., also produce noise of considerable magnitude in mining operations. The main sources of noise and expected levels are given below in **Table no – 4.9.**

Table4.9: Main Sources of Noise

Sl. No.	Source	Inside Cabin	Noise level at dB(A) 10 m. from source
1	Shovel	84-91	59-68
2.	Dumpers/Tippers	87-96	75-85
3.	Drill	88- 95	75-83

Prolonged exposure to a high noise level is harmful to the human auditory system and can create mental fatigue, rebellious attitude, annoyance and carelessness, which may lead to neglect of work and also result in accidents. The impact of noise level as per World Health Organization's 1986 notification is given below in **Table No-4.10**.

Table4.10: Impact of Noise Levels

NOISE LEVELS	ADVERSE EFFECTS
90-115 dB	Partial deafness and nervous irritability
> 115 dB	Permanent deafness
Impulsive noise (>90dB)	Frightens livestock grazing in the nearby areas

OSHA (Occupational Safety and Health Administration), USA and other similar organizations stipulate that noise level up to 90 dB(A) is acceptable for eight hours exposure Leq (Equivalent sound level) (8hrs) per day. The Directorate General of Mines Safety, in circular No. DG (Tech)/18 of 1975, has prescribed the noise level in mining occupations (TLV) for workers, in an 8 hour shift period with unprotected ear as 90 dB(A) or less.

The noise will be felt only near the active sources. There will be considerable reduction in the noise level due to the absorption factor, environmental surroundings and other attenuation factors. As far as absorption factor is concerned, If the ground cover is vegetated or has a soft texture, sound will decrease at the rate of 4.5dB(A) every time the distance between the source and the observer is doubled. Besides, there will be shielding factor, which takes into account the environmental surroundings. With every 30m of dense land scape vegetation, 5dB(A) of additional attenuation can be obtained upto a maximum of 10 dB(A).As such at away places the effect of noise will not be felt.

Anticipated noise levels resulting from operation of the various machineries like excavator, tippers, drill have been computed using point source model. Computation of cumulative noise levels at the nearby villages is made based on the assumption that there are no attenuation paths between the source and the boundary.

Noise modeling is carried out using the following formula:

Lp2 = Lp1 – 20 log R2/R1, Where, Lp1 and Lp2 are sound pressure levels at points located at distances R1 and R2 respectively from the source. The study results are as follows:

Table4.11: Post Project Noise Levels

Sl.No	Location	Baseline Day Eq.in dB(A)	Post project noise Eq in dB(A)	Limit dB(A) as per MoEF&CC
1.	North West Corner	41.5	58.1	90
2.	North East Corner	41.5	59.1	90
3	South East Corner	41.5	54.2	90
4	South West Corner	41.5	57.2	90
5	Samathuvapuram Village	41.2	43.0	55
6	Neykarapatti Village	48.3	48.4	55
7	R.Vadipatti Village	48.1	48.3	55
8	Tatanayakkanpatti Village	42.7	43.8	55

From the studies, it is found that the predicted Noise Levels due to mining operations at the periphery of the mine lease itself will be less even without considering any attenuation factor.

However, practically there will be attenuation due to vegetation etc., and as such there will not be any adverse noise propagation outside the lease boundary. Since the habitations are also away the effect of noise due to mining operations will not be felt at all in the surrounding villages.

4.4.2.1 CONTROL MEASURES FOR NOISE ENVIRONMENT:

Hence, by following mitigative measures for noise control, the impact on noise levels will be insignificant:

- Planting rows of native trees along roads, around mine area and other noise generating centers to act as acoustic barriers.
- Sound proof operator's cabin for equipment's like shovel, tippers,etc.
- Proper and regular maintenance of equipment's may lead to less noise generation.
- Providing in-built mechanism for reducing sound emissions.
- Providing earplugs to workers exposed to higher noise level.
- Conducting regular health check-up of workers including Audiometry test for the workers engaged in noise prone area.
- Displaying the noise level status of operational machinery on the machines to know the extent of noise level and to control the time to which the worker is exposed to higher noise levels.
- Provision of green net along the lease periphery.

Further green belt and afforestation will be planned and executed to abate noise and dust propagation in the area.

4.4.3 GROUND VIBRATIONAL DUE TO BLASTING EFFECTS:

Vibrations due to blasting may cause damage to nearby structures, if appropriate control measures are not adopted. Flyrock is another possible damage causing outcome of blasting. There are many factors, which influence these, like long explosive column with little stemming column, improper burden, loose material or pebbles near holes and long water columns in the holes.

The following control measures will be planned to reduce ground vibratory conditions to sustainable statutory limits:

1) Carrying out controlled blasting using Nonel delay detonator.
2) Optimum design for burden and spacing.
3) Reducing explosive charge per delay to minimum.
4) The peak particle velocity (PPV) of ground vibration will be kept very low through optimally controlled blasting techniques, after necessary field trials.
5) To contain fly rocks, stemming column to be less than burden of the hole. Blasting area will also be muffled, if necessary, to stop fly rocks propagation.
6) Blasting will not be carried out when strong winds are. Blasting will be done during midday time.
7) Controlled blasting to avoid tension cracks which may endanger the stability of bench slopes in the mine.
8) Proper care and supervision during blasting by a competent and experienced person to be carried out.

By adoption of above measures, it will be ensured that the ground level vibration due to blasting are maintained within the limits prescribed by DGMS, Dhanbad at the mining areas vide Circular No. 7 dated 29 -08-1997 as given below

Table4.12: Permissible Peak Particle Velocity (PPV) In Mining Areas

Inmm/sec

Type of structure	Dominant excitation frequency Hz		
	<8 Hz	8-25 Hz	>25 Hz
A. Buildings/structures not belonging to owner			
Domestic houses /structures (Kuchha brick and cement)	5	10	15
Industrial buildings (RCC and framed structures)	10	20	25
Objects of historical importance and sensitive structures.	2	5	10
B. Building belonging to owner with limited span of life			
Domestic houses/structures (Kuchha brick and cement)	10	15	25
Industrial buildings (RCC and framed structures)	15	25	50

Besides, different blasting time for the projects in the vicinity is suggested and the timing is to be mentioned in the display board in the respective mines entrance. SOP for blasting will be followed to ensure no impact on nearby structures.

4.5 LAND ENVIRONMENT:

This lease area in S.F.No.225/2A over an extent of 3.59.0Ha is a patta land registered in the name of the applicant vide patta No – 1822 (Refer Annexure No – 3) The present land use pattern, and the post mining land use pattern is shown below:

Table 4.13: Land Use

Sl. No.	Land Use	Present Area (Hect)	Area in use during the quarrying period (Hect)
1.	Quarrying Pit	Nil	2.76.0
2.	Infrastructure	Nil	0.01.0
3.	Roads	Nil	0.02.0
4.	Green Belt	Nil	0.30.0
5.	Unutilized	3.59.0	0.50.0
	Total	**3.59.0**	**3.59.0**

At the end of the 5 year period 2.76.0Ha will be used as mined out area at 23m below ground level sub sequently, in the remaining 6th to 10th year there will be only depth ward mining in the same mined out area up to 48m below ground level).

4.5.1 LAND RECLAMATION:

There is no waste generation anticipated in this quarry operation since the entire excavated material will be utilized. Hence, there is no external overburden dump involved. In the post mining stage, entire 2.76 Ha of mined out area will be left as water body, 0.02 Ha will be the mine roads, 0.01Ha will be infrastructure, 0.30 Ha Ha will be covered with vegetation and 0.50Ha will be left undisturbed.

Table4.14: Land Use During Post Operational Period

S.No	Description	Land use (Ha.)			
		Plantation	Water body	Others	Total
1	Quarrying Pit	-	2.760	-	**2.760**
2	Infrastructure	0.01	-	-	**0.01**
3.	Roads	-	-	0.02	**0.02**
4.	Green Belt	0.30	-	-	**0.3**
5.	Undisturbed Area	0.50	-	-	**0.5**
	TOTAL	**0.81**	**2.760**	**0.02**	**3.59**

Entire mined out area will be properly fenced to prevent inadvertent entry of men and animals. In the post mining stage the rainwater harvested in the mined out void shall be utilized to meet the water requirement of the project.

4.6 BIOLOGICAL ENVIRONMENT:

4.6.1 EXISTING FLORA AND FAUNA:

The core zone area is a hard rock formation area, with barren patches. Details of flora/fauna pattern in core and buffer zones have been described in chapter - III.

4.6.2 IMPACT OF MINING ON BIOLOGICAL ENVIRONMENT:

The significance of impact on biological environment due to mining and allied activities on various frontsis described below:

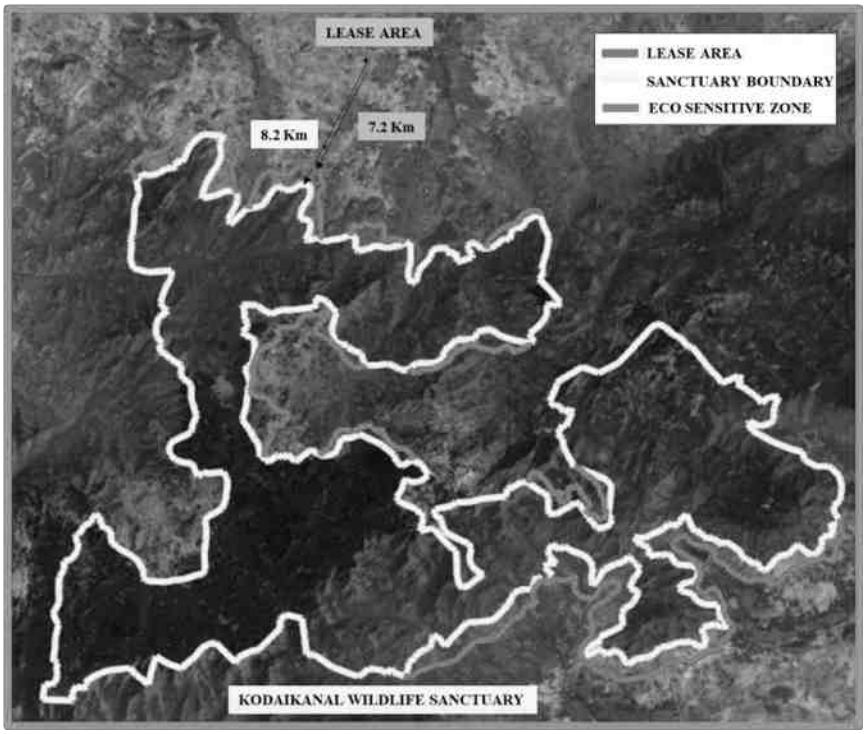
Table4.15: Impact on Biological Environment

S.No	ISSUES	OBSERVATIONS
1	Clearance of vegetation due to mining and allied activities	Other than clearing the shrubs and bushes withthin the lease area, no clearance of major vegetation is involved.
2	Retardation of tree growth, tip burning, etc, due to deposition of dust and the Particulate matter generated from the mining operation.	Necessary mitigative measures like dust suppression, proper maintenance of equipment's, roads will be carried out to prevent dust generation.
3	Proximity to national park/ wildlife sanctuary/reserve forest/mangroves/Coastline/estuary/sea	Kodaikanal Wildlife Sanctuary is located at a distance of 8.2Km from the lease area. As per MoEF&CC Notification S.O412(E)dated23.01.2020, the Eco sensitive Area is 7.2Km from the lease area. As such the project does not attract NBWL clearance. A map showing the same is provided as Figure No.4.5.
4	Release of effluents into water body that also supplies water to wildlife	There is no proposal to discharge any effluent into nearby water bodies.
5	Proposed project could increase siltation that would affect nearby biodiversity area	Surface runoff management structures like garland drain, settling pond etc. as explained above will be constructed and as such there will not be any appreciable impact on surface water quality which in turn can affect the bio diversity of the area.
6	Activities of the project affects the breeding/nesting sites of birds and animals	In the present ML area there is no wetland. A migratory bird needs sufficient wetlands with sufficient food, shelter, roosting places and nesting places which is not possible here.
7	Located near an area populated by rare or endangered species	There are no Schedule 1 animals
8	Risk of fall/slip or cause death to wild animals due to project activities	In the post mining stage, barbed wire fencing is proposed all around the mined out void to prevent falling of animals in the mine pits.
9	Project affects the forest-based	Not applicable

	livelihood/any specific forest product on which local livelihood depends	
10	Project likely to affect migration routes	No migration routes are in the area.
11	Project likely to affect flora of an area, which have medicinal value	No such significantly important medicinal value species within the ML area and its nearby region.
12	The project likely to affect wetlands, fish breeding grounds, marine ecology	There are no any wetlands, fish breeding grounds, marine ecology nearby the ML area which will be affected due to this project.
13	Project affects the agricultural activities in the region.	Due to poor soil condition and non availability of perrineal water source, no major agricultural activity is carried out in and around the lease area. Only patches of agricultural activityare observed on the eastern periphery of the study area along the river sides in few places in the monsoon season based on water availability. Coconut farms are seen the study area.

There are no migratory corridors, migratory avian-fauna, rare endemic and endangered species. Therefore there shall be no impacts due to mining activity on them. Even though there are no adverse impact on bio diversity and flora/fauna status due to project operations, positive impacts will arise due to well-planned reclamation measures for restoration of land status in the area ultimately to productive land category with elaborately planned green belt development activities.

Figure 4.5: Kodaikanal Wildlife Sanctuary Proximity Map



4.6.3 CONTROL MEASURES FOR BIOLOGICAL ASPECTS:

To reduce the adverse effects on flora/fauna status of the area due to deposition of dust generated from mining operations, mobile water tanker systems will be ensured in all dust prone areas to arrest dust generation.Methodical and well-planned plantation scheme will be carried out depending upon the immediate need, priority and availability of land. The plantation will be done along the lease boundary in a phased manner.

4.6.4 GREEN BELT& PLANTATION:

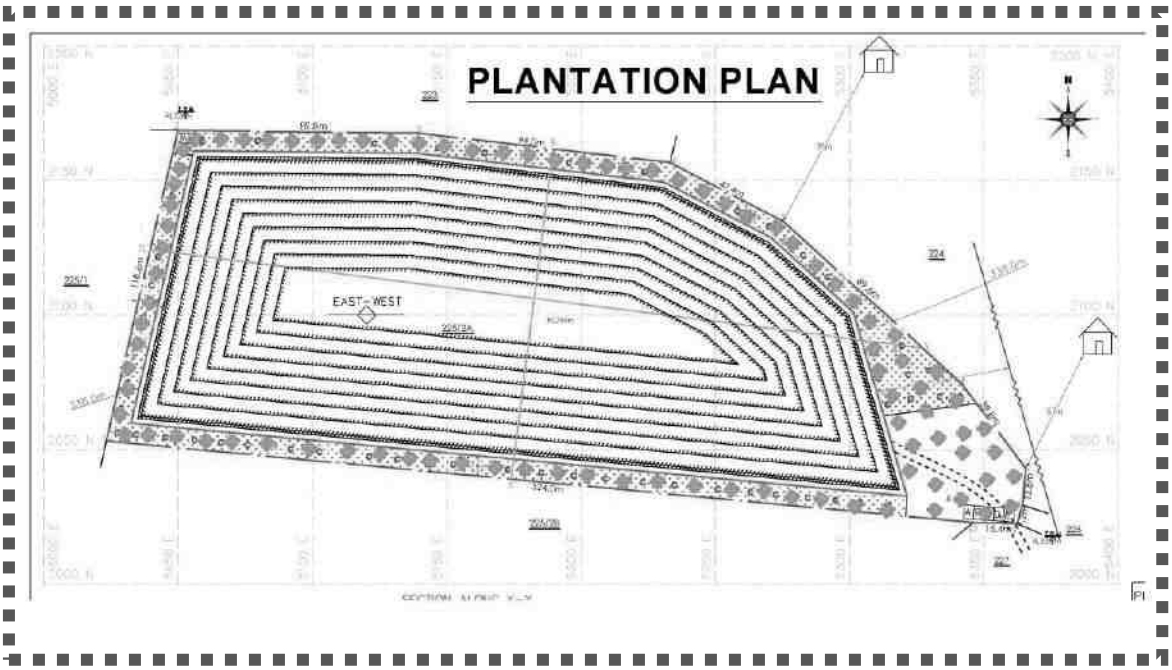
In the lease area, safety barrier 7.5m around the periphery, 50m safety distance for the c power line in the eastern ide of the lease area. Greenbelt / Plantation will be carried out to enhance the vegetative growth and aesthetic in the safety zone area. About 500 trees will be planted in and around the lease area.

Table4.16: Proposed Plantation

Year	No. of tress proposed to be planted	Name of the species
I	100	Pungai, Vagai, Vembu, Manjal konrai, Naval, Puvarasu, etc.,
II	100	
III	100	
IV	100	
V	100	
Total	500	

In the post mining stage, entire 2.760 Ha of mined out area will be left as water body, 0.01 Ha will be the infrastructure, 0.02Ha will be road, 0.30 Ha will be covered with vegetation and 0.50Ha will be left as undisturbed area.The post mining land use plan showing afforestation and water body is shown in **Figure No- 4.6.**

Figure 4.6: Mine Closure Plan



4.7 SOCIO ECONOMIC ENVIRONMENT:

The entire lease area is in the proponent's possession. Hence, there are no habitations or hutments in the core zone area and no rehabilitation or resettlement problems will arise here. The cart track and seasonal odai in proximity to the lease area not be disturbed by the proponent and sufficient safety barrier and protective measures has also been considered.

The mining operations in the proposed mine will employ about 18 persons directly and about 50 persons on indirect basis through allied opportunities in logistics, trading, repairing works etc. good employment potential will arise in this area, which will provide raising income levels and standards of living in the area through various service related activities connected with the project operations as shown under.

- Project related logistical operations for transport of Rough Stone, etc,
- Various trading services for consumer goods, spare parts, sundry items, etc.
- Contractual services connected with the project.
- Green belt and horticultural works in the project.
- Casual labor needs for various activities.

Besides, there will be improvement in the following aspects due to project operation:

- ❖ Improvement in infrastructural facilities, providing education aids etc. in nearby schools
- ❖ Betterment of drinking water facilities.
- ❖ Benefit to the State and the Central governments through financial revenues by way of royalty, tax, duties, etc from this project directly and also indirectly.

From above details, it is clear that the project operations will have highly beneficial positive impact in the area.

Table 4.17: CER Cost

Project Cost (Rs.)	Rs.94,11,000/-
CER Cost Requirement (2% of the Project Cost) (Rs.)	Rs.1,88,220/-
Revised CER cost allocated (Rs.)	Rs.5,00,000/-

Towards the socio economic development of the surrounding area, the proponent has earmarked an amount of Rs.5Lakhs under Corporate Environmental Responsibility. The activities identified under CER will be implemented in a phased manner in provision of facilities in nearby Government School.

4.8 OCCUPATIONAL HEALTH AND SAFETY:

4.8.1 BASELINE STATUS:

Primary data collection through field survey conducted in the study area reveals that there is no reported incident of any occupational diseases in the area. Hazardous jobs like blasting, loading, etc. are planned to be executed safely and with all precautionary measures as prescribed in Metalliferrous Mines Regulations of 1961, so as to minimize hazards and incidences of health problems.

4.8.2 IMPACTS ON OCCUPATIONAL HEALTH DUE TO PROJECT OPERATIONS:

Anticipated occupational illness sequel to mining activities can be as follows:

- Dust related pneumonia
- Tuberculosis
- Rheumatic arthritis

- Segmental vibration
- Miner's Nystagamus

4.8.3 MITIGATIVE MEASURES FOR OCCUPATIONAL HEALTH:

To reduce pollution emanation from the project, following measures are being and will be taken:

- Water sprinkling on haul roads etc.
- Green belt creation to arrest dust and reduce noise propagation.
- Acceptance of good control measures for reducing air pollution, as mentioned earlier in the chapter.
- Control of noise levels through good preventive maintenance of machineries, green belt creation, provision of ear plug to workers, etc.
- In addition to above measures, the following remedial steps are being and will be enforced to ensure minimization of occupational health and safety problems.
- Medical examination of workers by qualified doctors, as per DGMS circulars.
- Regular awareness campaigns amongst staff and workers
- Staff will be provided with PPE to guard against excess noise levels, Dust generation and inhalation, etc., as per standards prescribed by DGMS.

4.8.4 MITIGATIVE MEASURES FOR SAFETY ASPECTS:

The following safety gadgets will be provided to the staff and workers based on their area of operation and work& requirement:

Sl No	**Safety Equipments**
1.	Helmets
2.	Shoes
3.	Goggles
4.	Dust Mask
5.	Hand Gloves
6.	Reflective Jackets
7.	Ear Muffs
8.	Signal Lights/Flags

A total budgetary provision of Rs.50,000 under capital cost and Rs.10,000 is allocated under recurring cost towards Occupational health and Safety Budget.

4.9 LOGISTICAL SYSTEM:

From this proposed quarry the entire output will be transported to the crusher units for producing stone aggregates of different sizes or construction of roads, bridges, buildings and other buyers etc. The expected peak transport will be as follows:

Table4.18: Details of Transportation

Sl.no	Particulars of activity	Quantity
A	Maximum Material Transported (m3/year)	96,049
B	No of days in a year	300
C	Transport hours per day	8
D	Truck capacity in T	20
	Trips per hour	7Trips/hr

Since the production is less, there will be hardly about 7 trips per hour. The existing road can easily absorb this traffic due to this project. The following mitigative measures are suggested:

- Water sprinkling on material in the transport vehicles before transporting, so that no dust nuisance during transport will arise.
- Plantation on either side of the transport road in consultation with the concerned department.
- Proper maintenance of transport roads
- Proper maintenance of transport vehicles.
- Avoiding overloading of material
- Covering of loaded vehicles with tarpaulins sheet if warranted.
- Limiting of speed
- Provision of tyre washing facility at the mine outlet

4.10 WASTE MANAGEMENT:

Solid Waste: Since the entire mined out material will be used there will not be any solid waste generation from this project.

Liquid waste: There is no process effluent generation from this mine. Hence no liquid waste is generated.

Hazardous waste management: In this project the following management practices will be followed:

- Ensuring availability of different colour bins for collection of different types of waste.
- Storing of Hazardous waste material in a separate storage area with impervious containers for waste oil, oil contaminated clothes, used lead acid batteries, scraps, tyre storage etc.
- Ensure that there are no leakages/spillages of hazardous wastes.
- Ensuring that the fire extinguisher system is available at hazardous material storage area.

The hazardous waste if any will be disposed through authorized recyclers or re-processors periodically. The hazardous wastes will be transported in accordance with the provisions of rules. By effective implementation of above said mitigation measures no major impact due to Hazardous waste is expected.

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.

Conclusion:

Considering that the lease period of the existing quarries in the nearby region will be coming to an end shortly, this proposed quarry will serve more as a replacement for the existing quarries to ensure meeting the present rough stone demands and no major additional pollution load in the nearby region is envisaged.

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CHAPTER - V

ANALYSIS OF ALTERNATIVES (TECHNOLOGY & SITE)

CHAPTER 5 ANALYSIS OF ALTERNATIVES

5.1 ALTERNATE TECHNOLOGY:

This is a proposed Rough Stone and Jelly Quarry in which Semi – Mechanized Open Cast mining will be carried out. It involves jack hammer drilling, blasting, excavation, loading and transportation of Rough stone to the crushing units. As this method is techno economically proven, consideration of an alternate technology is not warranted.

5.2 ALTERNATE SITE:

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

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CHAPTER - VI

ENVIRONMENTAL MONITORING PROGRAMME

CHAPTER 6

ENVIRONMENTAL MONITORING PROGRAMME

6.1 GENERAL

In this project, appropriate environmental monitoring programme are framed. Regular, systematic and sustained programme schedules for implementation and monitoring of various control measures are devised with clear cut guidelines of various concerned plans for keeping a continuous surveillance on the various environmental quality parameters in the area.

The monitoring schedules are planned to aim at regular and systematic study of various pollution levels with respect to air and water quality, noise levels etc., to ensure that they conform to the standards laid down by the Environment Protection Act, 1986 and various Central and State Pollution Control Board Limits.

The various methodologies and frequency of studies of all environmental quality parameters will be as per prescribed norms laid down by MOEF&CC and State Pollution Control Board. This being a small quarry operation, the Mines in-charge will take care of all the environmental related works also.

Environmental control measures include components like air, water and soil quality, noise levels, afforestation measures, etc. For monitoring of environment over the life of the mine, a set of stations for study of quality parameters are fixed as per the actual requirements and prevailing conditions of environmental factors, as dictated from time to time, depending on the prevailing pollution levels.

6.2 MONITORING SCHEDULES FOR VARIOUS PARAMETERS

The monitoring schedules are planned for systematic study of various pollution levels with respect to air and water qualities, noise levels, etc. to ensure that they conform to the standards laid down by Environmental Protection Act and various statutory Limits. However, based on the need and priority it may be suitably modified / improved in consultation with local authorities. The monitoring schedules to be adopted in this quarry are given below.

Table 6.1: Environmental Monitoring Schedule

S.No	Environmental Parameters	Parameters to be monitored	Monitoring area coverage /locations	Frequency of monitoring
1	Air Quality	Sulphur dioxide (SO_2), Oxides of Nitrogen (NO_2), Respirable Particulate Matter ($PM_{2.5}$ and PM_{10}).	2 locations in the buffer zone and 1 work zone locations.	Once in a year in each location.
2	Water Quality	General, Physical, and chemical parameters	Ground Water samples (around the project area) and Mine Pit water samples	Once in a year
3	Water Table Fluctuations	Water Levels	Nearby wells and Borewells	On yearly basis pre and post monsoon level
4	Noise	Leq. Lmax Lmin, Leq Day & Leq Night dB(A)	Work zone locations and buffer zone villages	Once in a year
5	Vibration	Peak Particle Velocity	Mine periphery	Once to arrive at optimum blasting parameters
6	Socio Economic Environment	Socio Economic Survey, Review of implementation of CER activities proposed	Buffer Zone	Yearly basis
7	Occupational Health	Occupational health survey to detect early incidence of diseases, Audiometry Test for workers in noise prone area and review of safety matters.	Staff and Workers involved in the project	Once in a year
8	Greenbelt	Maintenance	Within the lease area	Regularly

6.3 LEGISLATIVE AND REGULATORY FRAME WORK:

The project will have environmental policy declaring its responsibility and commitment to protect the environment and to ensure public safety. The existing policy will be available with all concerned officials of the plant. The following environmental standards as per methodologies prescribed, by MOEF/CPCB/TNPCB will be enforced in this project:

Table 6.2: Environmental Standards

Standards	Issued By	Reference
National Ambient Air Quality Standards	Central Pollution Control Board	Table No. 6.3
Water quality standards per IS 10500:2012	Bureau of Indian Standards	Table No.6.4
Noise Standards	CPCB / MoEF&CC	Table No.6.5
Permissible Peak Particle Velocity	DGMS, Dhanbad	Table No.6.6

Table 6.3: National Ambient Air Quality Standards

NATIONAL AMBIENT AIR QUALITY STANDARDS
CENTRAL POLLUTION CONTROL BOARD
NOTIFICATION
New Delhi, the 18th November, 2009

No. B-29016/20/90/PCI-L.—In exercise of the powers conferred by Sub-section (2) (h) of section 16 of the Air (Prevention and Control of Pollution) Act, 1981 (Act No.14 of 1981), and in supersession of the Notification No(s). S.O. 384(E), dated 11th April, 1994 and S.O. 935(E), dated 14th October, 1998, the Central Pollution Control Board hereby notify the National Ambient Air Quality Standards with immediate effect, namely:-

NATIONAL AMBIENT AIR QUALITY STANDARDS

S. No.	Pollutant	Time Weighted Average	Concentration in Ambient Air		
			Industrial, Residential, Rural and Other Area	Ecologically Sensitive Area (notified by Central Government)	Methods of Measurement
(1)	(2)	(3)	(4)	(5)	(6)
1	Sulphur Dioxide (SO_2), µg/m³	Annual*	50	20	- Improved West and Gaeke -Ultraviolet fluorescence
		24 hours**	80	80	
2	Nitrogen Dioxide (NO_2), µg/m³	Annual*	40	30	- Modified Jacob & Hochheiser (Na-Arsenite) - Chemiluminescence
		24 hours**	80	80	
3	Particulate Matter (size less than 10µm) or PM_{10} µg/m³	Annual*	60	60	- Gravimetric - TOEM - Beta attenuation
		24 hours**	100	100	
4	Particulate Matter (size less than 2.5µm) or $PM_{2.5}$ µg/m³	Annual*	40	40	- Gravimetric - TOEM - Beta attenuation
		24 hours**	60	60	
5	Ozone (O_3) µg/m³	8 hours**	100	100	- UV photometric - Chemiluminescence - Chemical Method
		1 hour**	180	180	
6	Lead (Pb) µg/m³	Annual*	0.50	0.50	- AAS/ICP method after sampling on EPM 2000 or equivalent filter paper - ED-XRF using Teflon filter
		24 hours**	1.0	1.0	
7	Carbon Monoxide (CO) mg/m³	8 hours**	02	02	- Non Dispersive Infra Red (NDIR) spectroscopy
		1 hour**	04	04	
8	Ammonia (NH_3) µg/m³	Annual*	100	100	-Chemiluminescence -Indophenol blue method
		24 hours**	400	400	

(1)	(2)	(3)	(4)	(5)	(6)
9	Benzene (C_6H_6) $\mu g/m^3$	Annual*	05	05	- Gas chromatography based continuous analyzer - Adsorption and Desorption followed by GC analysis
10	Benzo(a) Pyrene (BaP) - particulate phase only, ng/m^3	Annual*	01	01	- Solvent extraction followed by HPLC/GC analysis
11	Arsenic (As), ng/m^3	Annual*	06	06	- AAS /ICP method after sampling on EPM 2000 or equivalent filter paper
12	Nickel (Ni), ng/m^3	Annual*	20	20	- AAS /ICP method after sampling on EPM 2000 or equivalent filter paper

* Annual arithmetic mean of minimum 104 measurements in a year at a particular site taken twice a week 24 hourly at uniform intervals.

** 24 hourly or 08 hourly or 01 hourly monitored values, as applicable, shall be complied with 98% of the time in a year. 2% of the time, they may exceed the limits but not on two consecutive days of monitoring.

Note. — Whenever and wherever monitoring results on two consecutive days of monitoring exceed the limits specified above for the respective category, it shall be considered adequate reason to institute regular or continuous monitoring and further investigation.

SANT PRASAD GAUTAM, Chairman
[ADVT-III/4/184/09/Envt.]

Note: The notifications on National Ambient Air Quality Standards were published by the Central Pollution Control Board in the Gazette of India, Extraordinary vide notification No(s). S.O. 384(E), dated 11th April, 1994 and S.O. 935(E), dated 14th October, 1998.

Table 6.4: IS – 10500 :2012 Standards

Table 1 Organoleptic and Physical Parameters
(*Foreword* and *Clause* 4)

Sl No.	Characteristic	Requirement (Acceptable Limit)	Permissible Limit in the Absence of Alternate Source	Method of Test, Ref to Part of IS 3025	Remarks
(1)	(2)	(3)	(4)	(5)	(6)
i)	Colour, Hazen units, *Max*	5	15	Part 4	Extended to 15 only, if toxic substances are not suspected in absence of alternate sources
ii)	Odour	Agreeable	Agreeable	Part 5	a) Test cold and when heated b) Test at several dilutions
iii)	*p*H value	6.5-8.5	No relaxation	Part 11	—
iv)	Taste	Agreeable	Agreeable	Parts 7 and 8	Test to be conducted only after safety has been established
v)	Turbidity, NTU, *Max*	1	5	Part 10	—
vi)	Total dissolved solids, mg/l, *Max*	500	2 000	Part 16	—

NOTE — It is recommended that the acceptable limit is to be implemented. Values in excess of those mentioned under 'acceptable' render the water not suitable, but still may be tolerated in the absence of an alternative source but up to the limits indicated under 'permissible limit in the absence of alternate source' in col 4, above which the sources will have to be rejected.

Table No – 6.4 contd.

Table 2 General Parameters Concerning Substances Undesirable in Excessive Amounts
(*Foreword* and *Clause* 4)

Sl No.	Characteristic	Requirement (Acceptable Limit)	Permissible Limit in the Absence of Alternate Source	Method of Test, Ref to	Remarks
(1)	(2)	(3)	(4)	(5)	(6)
i)	Aluminium (as Al), mg/l, *Max*	0.03	0.2	IS 3025 (Part 55)	—
ii)	Ammonia (as total ammonia-N), mg/l, *Max*	0.5	No relaxation	IS 3025 (Part 34)	—
iii)	Anionic detergents (as MBAS) mg/l, *Max*	0.2	1.0	Annex K of IS 13428	—
iv)	Barium (as Ba), mg/l, *Max*	0.7	No relaxation	Annex F of IS 13428* or IS 15302	—
v)	Boron (as B), mg/l, *Max*	0.5	1.0	IS 3025 (Part 57)	—
vi)	Calcium (as Ca), mg/l, *Max*	75	200	IS 3025 (Part 40)	—
vii)	Chloramines (as Cl_2), mg/l, *Max*	4.0	No relaxation	IS 3025 (Part 26)* or APHA 4500-Cl G	—
viii)	Chloride (as Cl), mg/l, *Max*	250	1 000	IS 3025 (Part 32)	—
ix)	Copper (as Cu), mg/l, *Max*	0.05	1.5	IS 3025 (Part 42)	—
x)	Fluoride (as F) mg/l, *Max*	1.0	1.5	IS 3025 (Part 60)	—
xi)	Free residual chlorine, mg/l, *Min*	0.2	1	IS 3025 (Part 26)	To be applicable only when water is chlorinated. Tested at consumer end. When protection against viral infection is required, it should be minimum 0.5 mg/l
xii)	Iron (as Fe), mg/l, *Max*	0.3	No relaxation	IS 3025 (Part 53)	Total concentration of manganese (as Mn) and iron (as Fe) shall not exceed 0.3 mg/l
xiii)	Magnesium (as Mg), mg/l, *Max*	30	100	IS 3025 (Part 46)	—
xiv)	Manganese (as Mn), mg/l, *Max*	0.1	0.3	IS 3025 (Part 59)	Total concentration of manganese (as Mn) and iron (as Fe) shall not exceed 0.3 mg/l
xv)	Mineral oil, mg/l, *Max*	0.5	No relaxation	Clause **6** of IS 3025 (Part 39) Infrared partition method	—
xvi)	Nitrate (as NO_3), mg/l, *Max*	45	No relaxation	IS 3025 (Part 34)	—
xvii)	Phenolic compounds (as C_6H_5OH), mg/l, *Max*	0.001	0.002	IS 3025 (Part 43)	—
xviii)	Selenium (as Se), mg/l, *Max*	0.01	No relaxation	IS 3025 (Part 56) or IS 15303*	—
xix)	Silver (as Ag), mg/l, *Max*	0.1	No relaxation	Annex J of IS 13428	—
xx)	Sulphate (as SO_4) mg/l, *Max*	200	400	IS 3025 (Part 24)	May be extended to 400 provided that Magnesium does not exceed 30
xxi)	Sulphide (as H_2S), mg/l, *Max*	0.05	No relaxation	IS 3025 (Part 29)	—
xxii)	Total alkalinity as calcium carbonate, mg/l, *Max*	200	600	IS 3025 (Part 23)	—
xxiii)	Total hardness (as $CaCO_3$), mg/l, *Max*	200	600	IS 3025 (Part 21)	—
xxiv)	Zinc (as Zn), mg/l, *Max*	5	15	IS 3025 (Part 49)	—

NOTES

1 In case of dispute, the method indicated by '*' shall be the referee method.

2 It is recommended that the acceptable limit is to be implemented. Values in excess of those mentioned under 'acceptable' render the water not suitable, but still may be tolerated in the absence of an alternative source but up to the limits indicated under 'permissible limit in the absence of alternate source' in col 4, above which the sources will have to be rejected.

Table 6.5: Noise Level Standards

Area Code	Category of Area	Limits in dB(A) Leq	
		Day Time	Night Time
(A)	Industrial area	75	70
(B)	Commercial area	65	55
(C)	Residential area	55	45
(D)	Silence Zone	50	40

Note :

1. Day time shall mean from 6 a.m. and 10.0 p.m.
2. Night time shall mean from 10.0 p.m. and 6 a.m.
3. Silence zone is an area comprising not less than 100 meters around hospitals, educational institutions, courts, religious places or any other area which is declared as such by the competent authority.
4. Mixed categories of areas may be average as one of the four above mentioned categories by the competent authority.

* dB(A) Leq denotes the time weighted average of the level of sound in decibels on scale A which is relatable to human hearing.

A “decibel” is a unit in which noise is measured.

“A”, in dB(A) Leq, denotes the frequency weighting in the measurement of noise and corresponds to frequency response characteristics of the human ear.

Leq: It is energy mean of the noise level over a specified period.

Table 6.6: Permissible Noise For Industrial Workers As Laid Down By CPCB

Exposure time (in hr. per day)	Limit in dB(A)
8	**90**
4	**93**
2	**96**
1	**99**
½	**102**
¼	**105**
1/8	**108**
1/16	**111**
1/32	**114**

Table 6.7: Permissible Peak Particle Velocity (PPV) In Mining Areas

In mm/sec.

Type of structure	Dominant excitation frequency Hz		
	<8 Hz	I 8-25 Hz	I >25 Hz
A. Buildings/structures not belonging to owner			
Domestic houses /structures (Kuchha brick and cement)	5	10	15
Industrial buildings (RCC and framed structures)	10	20	25
Objects of historical importance and sensitive structures.	2	5	10
B. Building belonging to owner with limited span of life			
Domestic houses/structures (Kuchha brick and cement)	10	15	25
Industrial buildings (RCC and framed structures)	15	25	50

The above said monitoring location and the frequency of monitoring shall be suitably modified in consultation with the nodal agency as per the actual requirements and prevailing conditions of the mine and environmental factors, as dictated from time to time, depending on the prevailing pollution levels, if required.

6.4 ENVIRONMENTAL MONITORING COST:

Towards environmental monitoring it is proposed to allocate a budget of Rs. 1.00 Lakhs per annum for this project. Further details of the capital and recurring cost of environmental management has been provided in in Table No. 10.2, Chapter-X.

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CHAPTER - VII

ADDITIONAL STUDIES

CHAPTER 7
ADDITIONAL STUDIES

7.1 GENERAL:

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

1. Public consultation of the project as per MoEF&CC mandates.
2. Risk Assessment
3. R&R Plan
4. Mine closure planning

7.2 PUBLIC CONSULTATION:

This draft EIA/EMP report will be submitted for public consultation as per mandatory procedures through the District Collector of Dindigul and State Pollution Control Board officials after giving 30 days advance notice in two local newspapers about the scheduled date and time for conduct of the public hearing procedures. The opinions, concerns and objections of stakeholders will berecorded during the public hearing. All the public queries and the replies to the query by the project proponent and officials concerned will be recorded and incorporated in the EIA/EMP report for approval by SEIAA, Tamil Nadu.

7.3 RISK ASSESSMENT:

For the various risks, likely to arise, detailed analysis of causes and control measures is given in below:

S.No	Factors	Causes of risks	Control measures
1.	Removal of material	a) Bench may slide due to its unconsolidated nature. b) Vibration due to movement of vehicles in the benches.	Overall bench slope angle will be maintained optimally as per DGMS requirement. Working bench width will be more than bench height.
2.	Drilling	a)Due to high pressure of compressed air hoses may burst. b) Down the hole drill rod may break due to improper maintenance of rod.	• Periodical preventative maintenance and replacement of worn out accessories in the compressor and drill equipment. • As per manufacturers recommendation rod to be replaced and bits will be changed.

S.No	Factors	Causes of risks	Control measures
3.	Blasting	a)Fly rock, ground vibration, noise etc. b) Improper charging of explosives	• Burden and spacing will be kept optimum on trial basis. • Explosive charge per delay will be minimized. • Controlled blasting with Nonel will be used.
4.	Excavation	a)Hauling and loading equipment are in such proximity while excavation b)Swinging of bucket over the body of tipper c) Driving of unauthorized person	• Operator shall not operate the machine when person & vehicles are in such proximity. • Shall not swing the bucket over the cab and operator leaves the machine after ensuring the bucket is on ground. • Shall not allow any unauthorized person to operate the machine by effective supervision.
5.	Transportation	a)Operating the vehicle "nose to tail" b) Overloading of material c) While reversal & overtaking of vehicle d) Operator of truck leaving his cabin when it is loaded	• It will be ensured that all these causes will be nullified by giving training to the operators. • No over loading will be done. • Audio visual reverse horn will be provided. • Proper training will be given.
6.	Fire due to electricity and Oil	a)Due to the short circuit of cables & other electrical parts b) Due to the leakage of inflammable liquid like diesel, oil etc.	• Electrical parts shall be cleaned frequently with the help of dry air blower • All fastening parts and places will be tightening. Suitable fire suppression equipment shall be provided.
7.	Natural calamities	Unexpected happenings	The mine management is capable to deal with the situation.

7.3.1. DISASTER MANAGEMENT PLAN:

In General, following natural/industrial hazards may occur during normal operation.

- Inundation of mine pit due to flood/excessive rains :
- Slope failure of the pit and waste dumps
- Accident due to heavy mining equipment and
- Blasting and use of Explosives

Mining operation in this lease will be carried out under the management control and direction of a qualified mine manager. The DGMS have been issuing a number of standing orders, model standing orders and circulars to be followed by the mine management in case of disaster. All these orders statutory rules and regulations will be followed. Seismically project site and study area falls in the Zone – II and is described as least active zone. There are no perennial water body near the lease area to cause any flooding. As such no disaster due to this project is envisaged.

In order to take care of above hazard / disasters the following control measures have been adopted.

- Checking and regular maintenance of garland drains and earthen bunds to avoid any inflow of surface water in the mine pit.
- Avoiding mining during heavy monsoon period and marching of all the HEMM to the top benches during rainy period.
- Provision of high capacity standby pumps with generator sets with sufficient quantity of diesel for emergency pumping especially during monsoon.
- All safety precautions and provisions of regulations will be strictly followed during all mining operations
- Prohibiting entry of unauthorized persons.
- Provision of Fire fighting and first-aid provisions in the mines.
- Provisions of all the safety appliances such as safety boot, helmets, goggles, dust masks, ear plugs and ear muffs etc. are made available to the employees for their use.
- Training and refresher courses for all the employees working in hazardous premises
- Observance of all safety precautions for blasting and storage of explosives as per MMR 1961.
- Working of mine, as per approved plans and regularly updating the mine plans
- Cleaning of mine faces regularly
- Proper storage, usage of explosives through competent persons.
- Regular maintenance and testing of all mining equipment as per manufacturers guidelines

- Suppression of dust on the haulage roads with frequent water sprinkling, etc.
- Increasing the awareness of safety and disaster through competitions, posters and annual safety weeks and environmental weeks, encouraged through suitable rewards and other similar drives.

The management and the EMC will be able to deal with the situations efficiently keeping in view of the likely sources of dangers in the mine.

7.4 REHABILITATION AND RESETTLEMENT (R & R) PLAN:

The mining activities will be carried out within the mine lease area only. The entire mine lease area of 3.59.0Ha is a Patta land. There is no population within the ML area. Hence, the question of R& R does not arise.

7.5 MINE CLOSURE PLAN:

It is proposed to carryout mining operation upto a depth of mining 23m for 5 years and 48m for 10 years (BGL). In the mine closure stage all necessary measures will be taken as per Act & Rules, There is no proposal for back filling, reclamation and rehabilitation. The quarried pits after the end of life of mine will be properly fenced all around to prevent inherent entry of public and cattle and all the statutory requirements will be fulfilled. As already explained, in the post mining stage the rainwater harvested in the mined out void shall be utilized for irrigation and domestic needs locally. The mine closure plan is provided in Figure 4.5 Chapter - IV

7.6 CUMULATIVE IMPACT STUDY:

The details of other quarries located within the 500m radius of this project has been provided in Annexure-12 and the same has been shown below:

Table 7.1: Details of quarries within 500m radius

S.No	Name and address of the lessee	Quarry location	Extent in Hectare	Lease Status
a.	**Existing Quarries**			
1	M.Deivam, S/o.Mockaiyathevar, No.2-B-83, Chinnakalayamputhur, Palani Taluk, Dindigul District.	S.F.No:221/3	1.83.0Ha	22.09.2017 to 21.09.2022
2	S.Athithyan, S/o.Senthil kathiresan, No.4/87.Pillaiyar koil street	223/1A2, 223/2A1	2.91.5Ha	20.11.2017 to 19.11.2022

	Pappampatti post Sulur, Coimbatore			
b. Abandoned Quarries				
1.	Tmt.R.Jayanthi W/o.L..Ramesh 6/1Nehru street, Udumalapet Taluk, Tripur District.	227/1	2.08.0	17.12.2015 to 16.12.2020
2.	L.Ramesh, S/o.Lakshumanasamy, 6/1Nehru street, Udumelpet 642 126	225/8,227/2,229/1A	4.31.0	12.10.2009 to 11.10.2014
C. Proposed Quarries				
1	Tvl.T & P Aggregates Private Limited, Chinnakalayamputhur Village, Palani Taluk, Dindigul District..	225/2A	3.59.0 Ha	Applied area(Rough stone)

From that above it is seen that, although the individual lease area of this project is less than 5 Ha, the other existing and proposed quarries within the 500m radius along with this subject project works out to >5 Ha. As such cluster situation applicable and this report is prepared. A map showing the existing and proposed quarries located near the lease area is provided Figure No.7.1 given below:

Figure 7.1: Vicinity Map

From the above table it is seen that the existing quarries of M.Deivam and S.Athithyan are present in the 500m radius. The baseline monitoring carried out for this project reflects the cumulative impact of these existing quarries. Considering that the lease period of the existing quarry quarries will be coming to an end shortly, the proposed quarry will serve as a replacement for the existing quarries to ensure meeting the present roughstone demands.

7.7 PIT SLOPE STABILITY PLAN

Factors affecting slope stability of the mine are

- Geological structure comprising dip, intervening shear zone formation, clay intrusion, joints / discontinuities, faults etc.,

- Lithology of formation
- Slope geometry
- Ground water availability which may cause increased thrust on the faces

Site specific analysis

Proposed area is a hard rocky charnockite terrain comprising top 2m earth, 1m weathered rock, followed by hard rock. Since the formation is of homogeneous rock type probability of slope failure is lo and can be avoided if proper measures are adopted.

There will be a 7.5m wide barrier zone and 50m safety zone on the eastern side of the lease area for the power line, which will form a ridge which can also take care of the top section and as such no risk is envisaged on this front.

Regular inspection of the mine faces to be carried out by mines manager for ensuring absence of any structural features like faults, joints, dyke, intrusive material in the rock strata which may affect the slope stability and cleared. No loose material or boulders is to be stacked on the mine top or pit benches.

Height of the benches should be 5m. Working bench width should be at least 2.5 times the bench height. Ultimate pit bench width will be 5m & slope is kept at 45^{o} to ensure slope stability. Haul road formation will be at 1 in 16 slope with adequate road width.

There will be no ground water table intersection. No seepage is expected due to formation. Adequate drainage management system comprising peripheral garland drain, settling pond to regulate monsoon water will be created to prevent saturation of compact layers, apparent drainage over the bench slope to avert damages to quarry face and manage the water flow. The above will ensure safe and stable mine prospects.

CONCLUSION:

No adverse impact on the surrounding environment is envisaged from this project since the number of equipment's to be used to achieve this production is less and the magnitude of operation is of low level.

Certified vehicles with low carbon emissions will only be used. 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 550 number of plants will be planted in and around the lease area.

Geologically the area in and around the lease area contains charnokite type rock formation containing mostly fallow land. As such there no major vegetation or agricultural activities are observed.

It will be ensured that mining will be carried out adhering to all the statutory rules and regulations, appointing statutory personnel's like qualified mines manager, blaster, informing DGMS before commencement of mining operations and maintaining the environmental quality within the prescribed standards by effective implementation of various mitigative measures.

As such release of Greenhouse gases (GHG), rise in temperature, affecting livelihood of the local people, loss of Agriculture, Forestry and Traditional Practices is not envisaged. Such a limited scope will not induce any climatic change leading to droughts, floods etc.

Mine closure plan plan is prepared for the lease period and already included in the approved mine plan.

Due to absence of perennial water bodies nearby where in any marine ecosystem is observed, no effect on this front is also expected. Hydrological investigation carried out and as given in Para 3.6 of Chapter III & para 4.3 Chapter – IV shows that the all-time ground water table in this area is much below the mining level. Hence, ground water intersection in not envisaged for the entire life of the mine and ground water will not be affected due to the quarrying operation. As such there will not be any adverse impact on the ground water regime. Besides, this being a mining project, there will be not be any process effluent. As mentioned earlier, the rainfall will be collected in the mine floor sump and gainfully used as per CGWA requirement. Excess water if any in the sump will be pumped to settling pond and supernatant clear water let out for downstream users.

It will be ensured that mining will be carried out adhering to all the statutory rules and regulations, appointing statutory personnel's like qualified mines manager, blaster, informing DGMS before commencement of mining operations and maintaining the environmental quality within the prescribed standards by effective implementation of various mitigative measures for the entire lease period.

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CHAPTER - VIII

PROJECT BENEFITS

CHAPTER 8
PROJECT BENEFITS

The proposed Roughstone and Jelly Quarry of Tvl. T & P Aggregates Private Limited will improve physical and social infrastructures in the area like:

- Direct employment to 24 people.
- Indirect employment to 50 people.
- Financial gains for the governments, through collection of various taxes like royalty, GST, etc.,
- Increase in General Awareness of the People.
- Continual improvements of the local amenities for the local society
- Improvement of the General Living Standard of the People in the Vicinity
- Overall Improvement in HDI (Human Development Index)
- Growth of Allied Industries in the Area.
- Improvement in Per Capita Income.
- Providing certain facilties for the local schools and panchyats

In short, the proposed Rough Stone Quarry will benefit this region in the fields of employment opportunities, improved per capita income for local people, improved social welfare facilities in respect of education, medical systems, infrastructural build-up, etc in its own way.

By means of carrying out the socio-economic development activities, local community development is expected. Towards the same, the proponent has planned to allocateRs.5Lakhsfor various activities under CER. The activities will be implemented once the mining operations commence. From the CER activities allocated for various social welfare activities, the villages near the lease area will be benefited.

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CHAPTER - IX

ENVIRONMENTAL COST BENEFIT ANALYSIS

CHAPTER 9

ENVIRONMENTAL COST BENEFIT ANALYSIS

Appendix-III of the MoEF notification S.O. 1533 dated 14.09.2006, which describes the generic structure of Environmental Impact Assessment document, states that the chapter ' Environmental cost benefit analysis' is applicable if it is recommended during scoping stage.

ToR for this project has been received from SEIAA, Tamil Nadu vide their letter No.SEIAA-TN/F.No.8833/ToR-1108/2021 dated 21.03.2022Environmental cost benefit analysis is not prescribed in the terms of reference. Hence, it is not applicable for this project.

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CHAPTER - X

ENVIRONMENTAL MANAGEMENT PLAN

CHAPTER 10

ENVIRONMENTAL MANAGEMENT PLAN

10.1 INTRODUCTION:

This chapter describes the implementation strategies of the environmental management measures described through the course of this EIA/EMP report for the purpose of mitigating significant impacts due to the proposed mining operations.

10.2 COMPONENTS OF THE ENVIRONMENTAL MANAGEMENT PLAN:

The environmental management plan comprises identification of the major impacts due to project operations and their suitable mitigative measures. (Provided in an elaborate manner in Chapter-IV) Based on the environmental policy of the company, the environmental management cell will oversee the implementation of these mitigative measures. The details of the proponent's environmental policy, environmental management cell and also the budgetary allocation towards various environmental management measures has been elaborated in this chapter.

10.2.1 ENVIRONMENTAL POLICY:

The proponent will frame a well-planned environmental policy. The salient features of this policy will be.

- Ensuring risk-free and safe mining operations by following all rules and conditions prescribed in the Indian mines Act, metalliferrous mining regulation, mineral conservation and development rules, etc,
- Ensuring environmental preservation by adoption of remedial measures for control of air, water quality, noise status, biological improvements, green belt creation, etc,.
- Extending CER activities to cater to the needs of local community for various benefits like improvement of physical and social infrastructures for the welfare of local community.

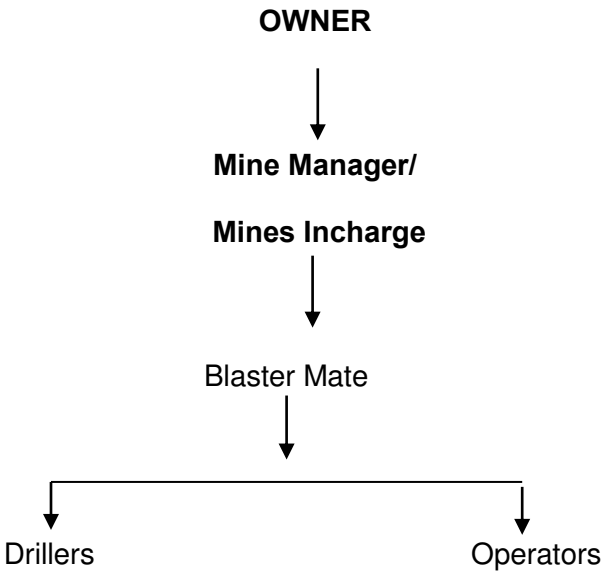
- ❖ Ensuring that all mining operations such as deployment of HEMM, conduct of drilling and blasting operations, etc are strictly conducted keeping with regulatory standards & maintaining safe working environment in the area.
- ❖ Providing periodical training on safety, Health, & Environment to all employers.
- ❖ Any infringement / violation of any rule or unsafe mining operations should be reported mines manager, should be reported by the foremen/ blaster mate etc, who will take immediate corrective measures for avoiding major disasters. The report will ultimately reach the owner through upwardly hierarchical communicative channels from the lowest level to superior levels in a quick time bound duration.
- ❖ The mines manager will exercise overall control over entire mining and connected operations and all infringements / violations on any count pertaining to unsafe operations, environmental degradation, etc, should be brought to the notice of the owner of the quarry. Remedial measures for such violations and deviations should be taken care by the mines manager to avoid any hazards or disasters in the mine and nearby areas. The persons responsible for such violations will be punished through appropriate disciplinarily penal actions.
- ❖ The EC conditions and stipulations will be strictly observed by Mines manager of the mine in various issues like prescribed environmental monitoring schedules conducting of vibratory studies due to blasting, creation of green belt, management of mined area, occupational health review, etc.
- ❖ Penalty actions will be taken by the proponent in cases of continuous negligence resulting in violations deviations in this respect.
- ❖ A time schedule of once in 90 days for review of all operational factors as mentioned above is to be enforced, for proper and quick corrective actions needed in the matter.

10.2.2 ENVIRONMENTAL MANAGEMENT CELL:

The Mines Manager/Mine Incharge will undertake effective monitoring and implementation of various environmental control measures promptly and effectively and to oversee various environmental management schemes for air quality control, water quality status, noise level

control, plantation programme, social development schemes, etc in the mine. The organizational chart for the same has been provided below:

Figure 10.1: Organization Chart



The Mines Manager/Mines Incharge in the mine project site will be directly responsible for various environmental activities in the mine. The owner will correlate and oversee the environmental activities and their effective implementation in consonance with the guidelines in the EMP. The Mines Manager/Mines Incharge will oversee the environmental administration at the mine and he will directly supervise all activities of environmental administration on environmental issues. Necessary assistance from sub ordinates, external consultants and laboratories shall be taken.

Environmental control measures will span various factors like land degradation, air, water and soil quality, noise levels, effective land reclamation for excavated areas, afforestation measures, etc. The administrative functions are given below.

- To observe the implementation of environmental control measures.
- To study the effects of project activities on the environment.
- To ensure implementation of Plantation Programme. Regular monitoring of survival rate of plants is carried out to achieve the desired result.

- To keep records of monitoring etc., in a systematic way, so as to facilitate easy access, when needed by statutory agencies, etc. Also send prescribed returns to statutory authorities.
- To ensure that adequate fencing and plantation is carried out in the safety zones.
- Conducting environmental studies and reporting to SPCB.
- To interact and liaise with Government Departments.
- To evaluate the performance of existing pollution control equipment and systems periodically and take timely action to keep the equipment at its optimum performance condition.
- To take immediate preventive action in case of some unforeseen environmental pollution attributable to the project.
- Conducting safety audits and programmes to create safety awareness in workers/ staff.
- Conducting annual health audits to detect any health problems promptly in the workers/staff. This will reduce occupational health problems.
- Imparting training on safety and conduct safety drills to educate employees. Firefighting equipment and system has to be kept in 'ready-to-fight' condition.
- Carrying out socio economic study in the surrounding areas to find out the benefits derived by the society due to the project and also to fulfill the deficiency, if any, immediately.
- Ensuring proper mine closure arrangements

10.2.3 ENVIRONMENTAL MANAGEMENT PLAN:

10.2.3.1 General:

Systematic monitoring systems and well-conceived and efficient Environment Management Plan will ensure that during the project operations, the various environmental parameters, are well within the statutorily sustainable limits. The environmental control measures proposed to keep

various environmental parameters of the project in terms of air, water, noise, land, biological environment, etc. has been described below.

10.2.3.2Air Quality:

With regards to air quality, to mitigate the fugitive and gaseous emission resulting from mining and allied activities, the following control measures are proposed to be undertaken:

- Regular water sprinkling in the transport roads using mobile tankers for dust suppression.
- Controlled blasting techniques with NONEL.
- Provision of dust filters / mask to workers working at highly dust prone and affected areas.
- Covering of drill holes with wet cloth, using sharp drill bits
- Avoiding blasting during high wind periods where the fine dust is carried out away easily affecting the ambient air quality.
- Proper maintenance of haul roads, HEMM and dumpers.
- Covering of loaded tippers with tarpaulins during transportation
- Vehicular emissions will be controlled through regular and proper preventive maintenance schedules and emissions tests are done with diesel smoke meter equipment to ensure emission values.
- Besides, there will be good green belt cover will be developed around mine periphery and in safety zone.
- Tin sheet will be erected on the eastern side of the lease area. Green netting will be carried out around the lease periphery on all the other sides.

10.2.3.3Water Environment:

There will be no process effluent generated from this project. The domestic sewage to be generated will be collected in septic tank with soak pit arrangements. Besides, there will be no

waste dumps or stockpiles within the lease area as the entire material will be directly dispatched to the consumers.

Surface runoff management structures such as garland drain of 800m length connected to a settling pond will be constructed around the quarry to collect the rain water. The supernatant clear water from the settling pond will be provided to nearby downstream users. Towards rainwater harvesting, the rainwater harvested in the mine will be used to meet the water requirements during mining and excess water in consultation with villagers and in line with government practices will be out in to the nearby stream or shall be distributed to the nearby villages as per their need.

There is a drainage channel originating on the south eastern side of the lease area at a distance of 55m from the lease area. There is no proposal to discharge any effluent into this water body. No major impact is envisaged on the nearby water bodies due to project operations. Elaborate details regarding the same is provided under section 4.3.3, Chapter-IV.

10.2.3.4 Noise Environment:

During the project operations, various control measures as listed below will be carried out to mitigate adverse impact due to the noise generated due to mining and allied activities:

- Good plantation will be carried out in the safety zone areas of 7.5m & 50m in the mine periphery.
- Noise protectors, insulation of operator cabins, installation of silencers in machineries, etc.
- Proper and regular maintenance of equipments
- Providing earplugs to workers exposed to higher noise level.
- Providing in-built mechanism for reducing sound emissions.
- Conducting regular health check-up of workers including Audiometry test for the workers engaged in noise prone area.

- Displaying the noise level status of operational machinery on the machines to know the extent of noise level and to control the time to which the worker is exposed to higher noise levels.

10.2.3.5 Ground Vibration

During the project operations, various control measures as listed below will be carried out to mitigate adverse impact due to the ground vibration caused due to blasting activities:

- Controlled blasting techniques to maintain the peak particle velocity (PPV) below DGMS prescribed levels.
- Ideally formulating drilling and charging pattern.
- To contain fly rocks, stemming column will not be less than burden of the hole. Blasting area will also be muffled, if necessary, to stop fly rocks propagation.
- Blasting will not be carried out when strong winds are blowing towards the inhabited areas. Blasting will be done during midday time and never at night.
- Proper care and supervision during blasting by a competent and experienced person.
- Besides, different blasting time for the projects in the vicinity is suggested and the timing is to be mentioned in the display board in the respective mines entrance.

Further details regarding the same has been provided under section 4.4.2, Chapter-IV.

10.2.3.6 Biological Environment:

Kodaikanal Wildlife Sanctuary is located at a distance of 8.2Km from the lease area. As per MoEF&CC Notification S.O412(E)dated23.01.2020, the Eco sensitive Area is 7.2Km from the lease area. As such the project does not attract NBWL clearance. Besides, no Schedule-I animals are observed in the core and buffer zone. There will be no major clearance of vegetation involved in this project. However, good greenbelt and plantation programmes are planned within the lease area.

In the lease area, safety barrier 7.5m & 50m is left around the periphery. Greenbelt / Plantation will be carried out to enhance the vegetative growth and aesthetic in the safety zone area. This

will boost the biological, visual and aesthetic outlook of the area. Elaborate details regarding the same is provided under section 4.6.4, Chapter-IV.

10.2.3.7 Socio-Economic Environment:

The proposed project operation will provide positive impacts in the region on the employment area as well as on physical and social infrastructural status. Many other tangible benefits will be gained by the local people in the surrounding areas due to ancillary units, trading operations, contractual needs, casual labor, green belt development, etc. Towards the socio economic development of the surrounding area, the proponent has earmarked an amount of Rs.5 Lakhs under Corporate Environmental Responsibility.

10.3 ENVIRONMENTAL POLLUTION CONTROL COST:

In this proposed quarry Implementation of environmental control measures as stated above involves capital as well as recurring expenses. The probable capital and recurring environmental control cost are calculated and given below **Table No – 10.1**

Table 10.1: Environmental Control Cost

Rs. In lakhs

Sl. No	Activity	Capital cost	Recurring Cost /Annum
1	Mobile Water Sprinkling	10.00	1.00
2	Provision of tin sheet and green net around the mine periphery	2.00	-
3	Green belt and Plantation (500 nos)	1.00	0.20
4	Surface Runoff Management Structures – Garland Drain, Settling Pond	0.50	0.10
5	Provision of tyre washing facilities	0.30	-
6	Provision of EC condition display board in the mine entrance	0.30	-
7	Safety Gadgets procurement and health checkup	0.50	0.25
8	Monitoring of environmental quality	-	1.00
9	Adopting controlled blasting technology using NONEL	-	5.00
10	Provision of net enabled CCTV cameras at mine workings	0.30	-
11	Remuneration of statutory persons	-	6.00
	Total	**14.90**	**13.55**

Towards EMP measures, Rs.14.90 lakhs is allocated under capital cost. Besides, Rs.13.55 lakhs per annum will be spent under recurring cost. All the recurring cost of maintenance of pollution control measures, environmental monitoring etc., will be met from revenue.

10.4 CONCLUSION:

A meticulously well planned Environmental Management Plan, with various programme schedules and timely execution objectives, as above, will ensure that the future environmental quality in the area will be maintained within statutory limits. The environmental management strategy as explained above will prove that industrial growth, if properly planned with all environmental concerns and appropriate remedial measures can go a long way to improve life pattern and living conditions of the local community around the project.

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CHAPTER-XI

SUMMARY AND CONCLUSION

CHAPTER 11

SUMMARY & CONCLUSION

11.1 INTRODUCTION:

Tvl.T & P Aggregates Private Limited proposes to operate a **Rough Stone and Jelly Quarry** Survey No.225/2A over an extent of 3.59.0Ha in Chinnakalayamputhur village, Palani Taluk, Dindigul District, Tamil Nadu, and has initiated action towards obtaining environmental clearance for the same. Entire lease area is own patta land.

Although the individual lease area of this project is less than 5 Ha, the other existing quarries within the 500m radius cluster along with this subject project works out to >5 Ha. Hence, this proposal is considered under Category – B1 and as per MoEF & CC notification necessitates preparation of EIA/EMP report and public hearing.

The proposed production for 10 years period is 6,36,690m^3 of Rough stone, 26,520m^3 of Weathered Rock and 55,212m^3 of Topsoil for the depth of 48m. During the first five years, it is proposed to mine 4,00,510m^3 of Rough stone, 26,520m^3 of Weathered Rock and 55,212m3 of Topsoil up to a depth of 23m. The impact assessment and management plan is studied for the peak production of the mine lease period and the entire area of quarry operation and can be construed as applicable for the entire lease period.

11.1.1 STATUTORY APPROVALS:

- **Mining Lease:** Precise Area Communication letter received from the Assistant Director, Dep. of Geology & Mining, Dindigul Vide Rc.No:897/2019 (Mines), dated 19.02.2021. **(Annexure-1)**
- **Mining Plan Approval:** Mine plan for this project was approved by Assistant Director, Dep. of Geology & Mining, Dindigul vide Rc.No:897/2019 (Mines), dated 10.05.2021. (**Annexure-2)**

  As mentioned in the precise area letter, 50m safety distance is maintained for the EB line passing on the eastern side of the lease area and no disturbance will be caused to the structures nearby during mining operation.

11.1.2 ENVIRONMENTAL CLEARANCE APPLICATION:

- **Terms of Reference:** Terms of Reference was issued by SEIAA Tamil Nadu vide letter No. SEIAA-TN/F.No.8833/ToR-1108/2021 dated 21.03.2022
- **Baseline Data Collection:** Baseline data collection for this project was carried out in the March – May 2022 (Summer Season)
- **Draft EIA/EMP Report:** This draft EIA/EMP report will be presented for public hearing, as per rules and procedures in line with the EIA notification 2006 wherein the opinions, concerns and objections if any, of the public and other stakeholders connected will be taken into consideration and a compliance report for the same will be incorporated in the final EIA/EMP report which will be submitted to SEIAA, Tamil Nadu.

11.2 SALIENT FEATURES OF THE PROJECT:

Table 11.1: Site Details

<table>
<tr><th>PARTICULARS</th><th>DETAILS</th></tr>
<tr><td>Name of the project</td><td>Rough Stone and Jelly Quarry of Tvl.T & P Aggregates Private Limited</td></tr>
<tr><td>Extent</td><td>3.59.0 Ha</td></tr>
<tr><td>Proposed production</td><td>
<table>
<tr><th>Years</th><th>Roughstone(m3)</th><th>Weathered Rock(m3)</th><th>Top Soil (m3)</th></tr>
<tr><td>1 -5</td><td>4,00,510</td><td>26,520</td><td>55,212</td></tr>
<tr><td>6 -10</td><td>2,36,180</td><td>-</td><td>-</td></tr>
<tr><td>Total</td><td>6,36,690</td><td>26,520</td><td>55,212</td></tr>
</table>
</td></tr>
<tr><td>Villages</td><td>Chinnakalayamputhur</td></tr>
<tr><td>Tehesil</td><td>Palani</td></tr>
<tr><td>District</td><td>Dindigul</td></tr>
<tr><td>State</td><td>Tamil Nadu</td></tr>
<tr><td>Latitude</td><td>10°28'03.98"N to 10°28'08.83"N</td></tr>
<tr><td>Longitude</td><td>77°26'41.59"E to 77°26'52.83"E</td></tr>
<tr><td>Toposheet</td><td>58 F /6,7,10 &11</td></tr>
<tr><td>Type of land</td><td>Own Patta Land</td></tr>
<tr><td>Topography</td><td>The area applied for quarry lease exhibits almost plain topography covered by Topsoil formation. The massive Charnockite formation is noticed below 2m (Avg) Topsoil and 1m Weathered rock formation and sloping towards South eastern side of the area, the altitude of the area is above 338m (maximum) from MSL</td></tr>
</table>

PARTICULARS	DETAILS
Accessibility	There is an existing road from the area leads to North Thathanaickenpatty – Chinnakalayamputhur village road on Northern side of the area. The Nearest Railway line is Dindigul – Pollachi line which is about 3.0Km on Northern side of the area. The National Highway (NH-209) Dindigul – Coimbatore is about 1.5Km on Northeastern side of the area. The State Highway (SH-192) Madathukulam – Thalaiyuthu is about 6.0Km on Northern side of the area.
Nearest Major RS	Palani – 7.0km (SE)
Nearest Airport	Madurai – 98Km – SE

Table 11.2: Environment Setting of The Study Area

PARTICULARS	DETAILS
Nearest major water bodies	• Drinage channel originates 55m (SE), • Odai 350m(SE), • Pachaiyar R is 5.1km - (S), • Varattar R is 5.4km – (SE), • Porandalar R 6.0Km(SE), • Palar 6.6Km(SE), • Kudiraiyar R 6.8Km(W)
Notified Archaeologically important places, Monuments	Nil within 10Km Radius.
Local Places of Historical and Tourism Interest	Arulmigu Dhandayuthapani Swamy Temple, Palani – 8.5km, SE
Environmental sensitive areas, Protected areas as per Wildlife Protection Act, 1972 (Tiger reserve, Elephant reserve, Biospheres, National parks, Wildlife sanctuaries, community reserves and conservation reserves)	Kodikanal wildlife sanctuary - 8.2Km – SW. Eco-sensitive zone of Kodaikanal wildlife Sanctuary as per Final Notification S.O 412 (E) dated 23.01.2010 of MOEF & CC is 7.2 Kms from the lease boundary and as such this project does not attract NBWL clearance.
Reserved / Protected Forests	Nil within 10 Km radius
Defence Relocations	Nil within 10 km radius
Seismic Zone	Zone – II (Least Active)
Other Industries in the area	Other than crushers, Roughstone quarries, no other major industries are located in the study area.

Table 11.3: Technical Description

<table>
<tr><th>PARTICULARS</th><th>DETAILS</th></tr>
<tr><td>Geological reserve</td><td>Roughstone – 16,12,620 cum, Weathered Rock- 35,836 cum, Gravel - 71,672cum</td></tr>
<tr><td>Mineable reserve upto 48m</td><td>Roughstone – 6,36,690 cum, Weathered Rock - 26,520 cum. Gravel -55,212cum</td></tr>
<tr><td>Method of Mining</td><td>Open cast mechanized mining method with shallow jack hammer drilling, blasting, excavation, loading and transportation of Roughstone to needy buyers.</td></tr>
<tr><td>Production</td><td>
<table>
<tr><th>YEAR</th><th>Roughstone (m3)</th><th>Weathered Rock m^3</th><th>Topsoil (m3)</th></tr>
<tr><td>I</td><td>79825</td><td>16224</td><td>33598</td></tr>
<tr><td>II</td><td>79815</td><td>10296</td><td>21614</td></tr>
<tr><td>III</td><td>79980</td><td>--</td><td>--</td></tr>
<tr><td>IV</td><td>80180</td><td></td><td>-</td></tr>
<tr><td>V</td><td>80710</td><td></td><td>-</td></tr>
<tr><td>Sub Total (Year I to V)</td><td>4,00,510</td><td>26520</td><td>55212</td></tr>
<tr><td>Year VI to X</td><td>2,36,180</td><td>-</td><td>-</td></tr>
<tr><td>Total</td><td>6,36,690</td><td>26,520</td><td>55,212</td></tr>
</table>
</td></tr>
<tr><td>Waste Generation and Management</td><td>There is no waste generation anticipated in this quarry operation since the entire excavated material will be utilized. The overburden in the form top soil will be utilized for formation of boundary barrier, afforestation purpose and disposed outside after paying necessary fees to Government. The rough stone, weathered rock will be excavated and loaded into tipper to the needy buyers for producing crusher aggregates, M Sand.</td></tr>
<tr><td>Depth</td><td>First 5 years – 23m
Balance 5 years - 48m</td></tr>
<tr><td>Man power</td><td>24 no’s</td></tr>
<tr><td>Mode of transport</td><td>By Road</td></tr>
<tr><td>Water requirement</td><td>10 KLD</td></tr>
<tr><td>Source of water</td><td>The required water will be procured from outside agencies initially. Later, water collected in the mine pit will be used to meet the needs.</td></tr>
<tr><td>Power requirement</td><td>All the equipment will be diesel operated. No electricity is needed for mining operation. The minimum power requirement for office, etc will be met from state grid.</td></tr>
<tr><td>Life of the mine</td><td>10 Years</td></tr>
<tr><td>Project cost</td><td>Rs.94,11,000/-</td></tr>
</table>

11.3 EXISTING ENVIRONMENTAL SCENARIO:

11.3.1 GENERAL:

The studies and data collection have been carried out systematically and meticulously as per relevant IS codes, CPCB and MoEF&CC guidelines and as per approved ToR during **Summer Season (March 2022 to May 2022)** For the purpose of this study, the area has been divided into two zones, namely, core and buffer zones. Core zone is considered as the total lease area, while buffer zone encompasses an area of 10 km radius distance from the periphery of core zone.

11.3.2 SOCIO-ECONOMIC STATUS:

The proposed quarry is located in in Chinnakalayamputhur Village, Palani Taluk, Dindigul District. Based on 2011 census data, in the 10km radius there are 32 Rural villages from Two Taluks namely Palani, Madathukulam and 6 urban areas of Palani Taluk namely Chinnakalayamputhur(CT), Neikkarapatti (TP), Palani (M), Balasamudram (TP), Sivagiripatti (CT), Sankaramanallur (TP) belonging to Dindigul and Tiruppur District.

Table 11.4: Social, Economic And Demographic Profile of the Study Area

Details	Population	Percentage
A. Gender-wise distribution		
Male Population	111072	49.86
Female Population	111696	50.14
Total	**222768**	**100**
B. Caste-wise population distribution		
Scheduled Caste	57800	25.95
Scheduled Tribes	903	0.41
Other	164065	73.65
Total	**222768**	**100**
C. Literacy Levels		
Total Literate Population	155702	69.89
Others	67066	30.11
Total	**222768**	**100**
D. Occupational structure		
Main workers	99987	44.90
Marginal workers	7820	3.50
Total Workers	**107807**	**48.40**
Total Non-workers	**114961**	**51.60**
Total	**222768**	**100**

11.3.2.1 SAMPLE SURVEY:

Nearby villages were visited for conducting sample Village survey on all socio-economic aspects and requirements of the people. The existing socio-economic scenario is studied and CER activities are also suggested to the proponent. The study details are given in **Para 3.2.4, Chapter – III**.

11.3.3 EXISTING ENVIRONMENTAL QUALITY:

Baseline monitoring was carried out during Summer Season (March 2022 to May 2022). The details of the same are provided below:

Table 11.5: Baseline Data

A) METEOROLOGICAL DATA	**Monitoring Location -** Near Mine Lease Area		
PARAMETERS	**MINIMUM**	**MAXIMUM**	
Temperature in °C	15.1	36.1	
Humidity in %	12.0	98.5	
Wind speed Km/Hr	<1.8	29.5	
Predominant wind direction (From)	SSW, SW		
B) AMBIENT AIR QUALITY	**Monitoring Location –** 5 locations		
PARAMETER	**RESULT (µg/m3)**		***LIMIT (µg/m3)**
Location	**Core Zone**	**Buffer Zone**	
Particulate Matter (Size <10 µm)	40.1 – 50.2	40.7 – 62.5	100
Particulate Matter (Size <2.5 µm)	17.9 – 22.6	18.7 – 29.1	60
Sulphur Dioxide (as SO_2)	3.5 – 5.8	3.9 – 6.7	80
Nitrogen Dioxide (as NO_2)	6.1 – 8.4	5.9 – 9.4	80
Conclusion: The existing Ambient Air Quality levels for PM10, PM2.5, SO2 and NO2, are within the NAAQ standards prescribed CPCB limits of 100 µg/m3, 60 µg/m3, 80 µg/m3 & 80 µg/m3. The CO values in all the locations were found to be below detectable limit. Silica values in the study area are found to be below detectable limit. (Detection limit – 0.05 mg/m3)			
C) WATER QUALITY	**Monitoring Location –** 4 locations		
PARAMETER	**Result**		***LIMIT (µg/m3)**
pH at 25 ˚C	8.02 – 8.25		**6.5-8.5**
Total Dissolved Solids, mg/L	215 – 1250		**2000**
Chloride as Cl-, mg/L	29.4 – 479		**1000**
Total Hardness (as CaCO3), mg/L	122 – 561		**600**
Total Alkalinity (as CaCO3), mg/L	144– 248		**600**
Sulphates as SO42-, mg/L	21.4 – 345		**400**
Iron as Fe, mg/L	BDL– 0.09		**0.3**

Nitrate as NO3, mg/L	BDL– 2.73	**45**
Fluoride as F, mg/L	0.11 – 0.42	**1.5**
Conclusion: The water quality of ground water is found to be within the prescribed Permissible limits of IS: 10500 Norms in the absence of an alternative source as per Drinking Water Specifications.		

D) NOISE LEVELS	**Monitoring Location –** 5 locations		
PARAMETER	**RESULT dB(A)**		***LIMIT (µg/m3)**
	Day Equivalent	**Night Equivalent**	
Core Zone	41.5	37.9	**90**
Buffer Zone	41.2 – 48.3	38.0 – 41.8	**Day Equivalent - 55dB(A), Night Equivalent - 45dB(A)**
*Permissible noise for industrial workers as laid down by CPCB (at 8 hrs Exposure Time). While comparing with the MoEF&CC Norms, the monitored ambient noise levels are generally within the limit values.			

E) SOIL QUALITY	**Monitoring Location –** 3 locations
PARAMETER	**Range of values**
pH	6.74 to 7.12
Electrical Conductivity (µmho/cm)	32.26 – 42.67
Organic matter (%)	0.68 – 0.75
Total Nitrogen (mg/kg)	142 – 210
Phosphorus (mg/kg)	1.32 – 2.05
Sodium (mg/kg)	342- 410
Potassium (mg/kg)	610 -752
Conclusion: The soil quality data for the 3 samples collected and analyzed are provided in Table No – 3.17.	

F) LAND EVIRONMENT:

For the present study on land use pattern in the study area, remote sensing satellite data have been used. The area estimated of land use categories around the 10km buffer zone is provided below:

Table 11.6: Land Use in 10Km Buffer Zone

S.No	Landuse Feature	Area (Sq.Km)	Percentage
1	Agriculture/ Plantation	123.0711	38.12
2	Fallow Land	63.7543	19.74
3	Land With Scrub	84.2901	26.10
4	Land Without Scrub	23.3255	7.22
5	Water bodies	6.5277	2.02
6	Mining Area/ Industries	1.259	0.39
7	Reserve Forest	8.5065	2.63
8	Settlement	12.158	3.77
	Total	**322.8922**	**100**

From the above table it is seen that 38.12 % of the study area is agriculture land and 19.74 % are fallow land. Land with scrub constitutes 26.10 %, lands without scrub constitute 7.22% waterbodies constitute 2.02% and remaining others constitute 6.79 %. Details are given in **Para 3.4.1, Chapter – III**.

G) BIOLOGICAL ENVIRONMENT:

Flora: The lease area is a non-forest, private land with grasses shrubs, few trees like Prosopis juliflora, neem etc The Dominated species are Albizia amara, Borassus flabelliformis, Morinda tinctoria, Azadirachta indica, Cocus nucifera etc. Patches of coconut farms are also observed.

Fauna: Other than domestic animal, no wild animals are reported in and around the lease area. There is no Schedule-1 species in and around core zone.

Kodikanal wildlife sanctuary - 8.2 Km – SW. The Eco-sensitive zone of Kodaikanal wildlife Sanctuary as per Final Notification S.O 412 (E) dated 23.01.2010 of MOEF & CC is 7.2 Kms from the lease boundary and as such this project does not attract NBWL clearance. The detailed list of fauna Species in the buffer zone is given in Table No - 3.25, Chapter - III.

H) HYDROLOGICAL STUDY:

Study of the area shows that the sub-surface formations reveal less of soil with low recharge potentials. Subsequently hard and massive formations of rock are found.

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 are available mainly after post monsoon and it reduces during summer necessitating only dry crops cultivation. Bore wells are as deep as 300 ft also and it reflects that the yield is only better at deeper water levels.

Based on the available information and the geophysical investigations it is concluded that the project area is considered to poor groundwater potential up to 50m. Besides, the mining area consists of hard compact rock, no major water seepage within the mine is expected. There is no water seepage noticed in to the already quarried pits situated nearby the proposed quarry area. Hence, the quarrying rough stone up to the proposed depth may not have any adverse impact in the area over ground water conditions.

Rain water collected in the tanks in the region acts as a good source of water during post monsoon. 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.

11.4 ANTICIPATED ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES:

11.4.1 GENERAL:

This is a proposed project and Semi – Mechanized Open Cast mining will be carried out to quarry out Rough Stone & Gravel. The identified impacts due to this mine during mining and associated activities have been studied in relation to various environmental components like Air, water, noise, vibration, land, transport etc. **The impact assessment and management plan is studied for the peak production of the mine lease period and the entire area of quarry operation and can be construed as applicable for the entire lease period**.

11.4.2 AIR ENVIRONMENT:

The principal sources of air pollution in the area due to mining and allied activities are dust generation in the mine due to various activities such as excavation of material, movement of HEMM, loading, unloading and transportation operations.. Besides, Gas emission also occur as a result of emission of SO2, NOx, CO etc., from diesel driven mining equipment, compressors, generator sets, etc. The following measures will be adopted to control impact on the air quality due to mining operations in the lease area:

Table 11.7: Mitigation Measures – Air Environment

S.No	Activity	Mitigation Measures
1	Drilling	Usage of Drill bits in good condition
		Covering of drill holes with wet cloth
		Usage of sharp drill bits for drilling of holes.
		Provision of dust filters / mask to workers working at highly dust prone and affected areas.
2	Blasting	Well-designed blasting parameter, effective stemming to achieve optimum breakage occurs without generating fines.
		Use of appropriate explosives for blasting and avoiding overcharging of blast holes.
		Avoiding blasting during high wind periods where the fine dust is carried out away easily affecting the ambient air quality.

		Use of controlled blasting techniques with Nonel to keep the dust generation, noise as well as vibration level within the prescribed limits.
3	Excavation and Loading	Proper maintenance of HEMM
		Enclosures for operator cabin.
		Imparting sufficient training to operators on safety and environmental parameters.
		Proper maintenance of hauling equipments.
		Avoiding overloading of dumpers.
4	Transportation	Regular wetting of transport road using mobile water tanker.
		Setting up of tyre wash facility in the transport road.
		Proper maintenance of haul road and other roads
		Avoiding overloading of tippers
		Covering of loaded tippers with tarpaulins during transportation
		Vehicular emissions will be controlled through regular and proper preventive maintenance schedules and emissions tests are done with diesel smoke meter equipment to ensure emission values.
5	Others	Development of greenbelt / barriers around mine in the safety zone and carrying out plantation within the lease area.
		50m safety distance has been left for the power line adjacent to the eastern side of the lease area. Tin sheet will be erected along the eastern side of the lease area. Green netting will be carried out around the lease periphery on all other sides.

Due to adoption of all these measures, no major impact on air quality is envisaged due to this proposed opencast mining operation.

The impact on air quality due to the proposed project is estimated using AERMOD View Gaussian Plume Air Dispersion Model developed by Lakes Environmental Software which is based on steady state Gaussian plume dispersion. Ground Level Concentration (GLC) have been computed using hourly meteorological data for particulate matter PM10 and PM2.5.

The resultant added concentrations with baseline figures even at worst scenario, show that the values of ambient air quality with respect to PM_{10} are in the range of 52.9 μg/m3 to 63.5 μg/m3 and with respect to PM2.5 are in the range of 24.4 μg/m3 to 30.1 μg/m3 which are within the statutory limits in each case.

For preservation of environment in this mine strict enforcement of management schemes will be undertaken for taking corrective actions, as needed. By adopting the effective implementation

of all the mitigative measures, no adverse impact on Air quality due to the mining operation in this lease area is expected.

11.4.3 WATER ENVIRONMENT:

Water Requirement: The total water requirement for this project will be 10.0 KLD comprising 1.0 KLD for drinking water and domestic use, 8.0 KLD for dust suppression and 1.0 KLD for greenbelt. The water will be sourced initially from outside agencies. Later the rainwater collected in the mine pit sump will be used for this purpose.

The activity / source of pollution, its impact / consequence, proposed control measures are explained below:

Table 11.8: Mitigation Measures – Water Pollution

S.No	Source	Consequence	Mitigation Measures
A	Domestic use	Generation of waste water	The domestic sewage to be generated from the project will be collected in septic tank with soak pits.
B	Rainfall	Runoff from waste dump and stack	Towards surface runoff management, a garland drain of length 800m will be constructed around the quarry and will be connected to a settling pond with silt traps. The supernatant clear water from the settling pond will be flow to the downstream users.
		Rainwater Harvesting	The rain water falling in the quarry will be harvested in the sump at the lowest level of the quarry. This sump will act as a settling pond to prevent solids escaping along with discharge, before outlet. etc.
C	Drainage Course	Disturbance to drainage course	There is a drainage channel originating on the south eastern side of the lease area at a distance of 55m from the lease area. There is no proposal to discharge any effluent into this water body. No major impact is envisaged on the nearby water bodies due to project operations.

- **Stage of Groundwater Development:** The groundwater resource data of Dindigul district was obtained from the data provided in the technical report of the National Water Mission, Ministry of Jal Shakti, Department of Water Resource – Notes on Dindigul District. Based on the report it is seen that this area can be categorized as ‘Safe’ from ground water development point of view.
- **Generation of mine pit water:** The occurrence and movement of groundwater in hard rock formations are restricted to the porous zones of weathered formations and the open

systems of fractures, fissures and joints. Generally, in hard rock regions, occurrence of weathered thickness is discontinuous both in space and depth. Hence recharge of groundwater in hard rock formations is influenced by the intensity and depth of weathering. In the nearby region, the formations are compact with less intergranular porosity and fractures leading to less permeability and transmissivity values and as such the ground water level in this area is deep from surface. The mining area consists of hard compact rock, hence no major water seepage within the mine is expected from the periphery. The ultimate pit depth of mining is 48m. The ground water table in this area is below this level. Hence, ground water intersection in not envisaged and ground water will not be affected appreciably due to the quarrying operation. Nearby mine workings also does not show any major seepage.

11.4.4 NOISE ENVIRONMENT:

Anticipated noise levels resulting from operation of the various machineries like excavator, tippers, drill have been computed using point source model. Computation of cumulative noise levels at the nearby villages is made based on the assumption that there are no attenuation paths between the source and the boundary. From the studies, it is found that the predicted Noise Levels due to mining operations at the periphery of the mine lease itself will be less even without considering any attenuation factor. However, practically there will be attenuation due to vegetation etc., and as such there will not be any adverse noise propagation outside the lease boundary. Since the habitations are also away the effect of noise due to mining operations will not be felt at all in the surrounding village. Hence, by implementing the following mitigative measures for noise control, the impact on noise levels will continue to be insignificant:

- Planting rows of native trees along roads, around mine area and other noise generating centers to act as acoustic barriers.
- Sound proof operator’s cabin for equipments like shovel, tippers, etc.
- Proper and regular maintenance of equipments may lead to less noise generation.
- Providing in-built mechanism for reducing sound emissions.
- Providing earplugs to workers exposed to higher noise level.
- Conducting regular health check-up of workers including Audiometry test for the workers engaged in noise prone area.

- Displaying the noise level status of operational machinery on the machines to know the extent of noise level and to control the time to which the worker is exposed to higher noise levels.
- Provision of green net on the lease periphery.

Further green belt and afforestation will be planned and executed to abate noise and dust propagation in the area.

11.4.5. VIBRATION:

To reduce ground vibratory conditions, various control measures will be implemented such as keeping PPV below 10mm/s for 8-25hz frequency range, formulating drilling and charging pattern with less explosive charge, initiating sequence and using NONEL, carrying out blasting with minimum charge per delay, avoiding blasting during strong winds etc. By adoption of above measures, it will be ensured that the ground level vibration due to blasting are maintained within the limits prescribed by DGMS, Dhanbad at the mining areas vide Circular No. 7 dated 29 -08-1997. Besides, different blasting time for the projects in the vicinity is suggested and the timing is to be mentioned in the display board in the respective mines entrance. SOP for blasting will be followed to ensure no impact on nearby structures. Elaborate details regarding the same are provided under section 4.4.2, Chapter-IV.

11.4.6 IMPACT ON LAND ENVIRONMENT:

This lease area in S.F.No.225/2A over an extent of 3.59.0Ha is a patta land registered in the name of the applicant vide patta No – 1822. There is no waste generation anticipated in this quarry operation since the entire excavated material will be utilized. Hence, there is no external overburden dump involved. In the post mining stage, entire 2.76 Ha of mined out area will be left as water body, 0.02 Ha will be the mine roads, 0.01Ha will be infrastructure, 0.30 Ha Ha will be covered with vegetation and 0.50Ha will be left undisturbed. Entire mined out area will be properly fenced to prevent inadvertent entry of men and animals. In the post mining stage the rainwater harvested in the mined out void shall be utilized.

11.4.7 BIOLOGICAL ENVIRONMENT:

Other than clearing the shrubs and bushes withthin the lease area, no clearance of major vegetation is involved. Necessary mitigative measures like dust suppression, proper

maintenance of equipment's, greenbelt and plantation etc., will be carried out to prevent dust generation & any further impact on the vegetation.

In the lease area, safety barrier has been left around the mine periphery. Greenbelt / Plantation will be carried out to enhance the vegetative growth and aesthetic in the safety zone area. In the post mining stage, entire 2.760 Ha of mined out area will be left as water body, 0.01 Ha will be the infrastructure, 0.02Ha will be road, 0.30 Ha will be covered with vegetation and 0.50Ha will be left as undisturbed area.

11.4.8 SOCIO ECONOMIC ENVIRONMENT:

The entire lease area is a private patta land. Hence, there are no habitations or hutments in the core zone area and no rehabilitation or resettlement problems will arise here.

The mining operations in the proposed quarry will employ about 24 people. Besides through allied opportunities in logistics, trading, repairing works etc. good employment potential will arise in this area, which will provide raising income levels and standards of living in the area through various service related activities connected with the project operations.

Towards the socio economic development of the surrounding area, the proponent has earmarked an amount of Rs.5 Lakhs under Corporate Environmental Responsibility. The activities identified under CER will be implemented in a phased manner.In consultation with the locals based on the need & priority it will be implemented.

11.4.9 OCCUPATIONAL HEALTH AND SAFETY ASPECTS:

In order to ensure minimisation of occupational health and safety problems in the project operation, the following preventive remedial measures will be effectively exercised in the project operations, so as to comply with applicable standards.

- Medical examination of workers at pre-entry level stage of workers, etc., by qualified doctors, with periodical examination of all workers/staff at least once a year, as per DGMS circulars.
- Regular awareness campaigns amongst staff and workers
- Staff will be provided with PPE to guard against excess noise levels, Dust generation and inhalation, etc., as per standards prescribed by DGMS.
- A total budgetary provision of Rs.50,000 under capital cost and Rs.10,000 is allocated under recurring cost towards Occupational health and Safety Budget.

11.4.10 IMPACT ON LOCAL LOGISTICAL SYSTEM DUE TO PROJECT:

From this proposed quarry the entire output will be transported to the consumers like external crusher units for producing stone aggregates of different sizes or construction of roads, bridges, buildings and other buyers etc. Since the productivity is less, there will be about 7 trips per hour. The transport route can easily absorb this negligible traffic due to this project. The following mitigative measures are suggested for mitigation of adverse impacts on the logistical aspect of the project:

- Water sprinkling on Rough stone in the transport vehicles before transporting, so that no dust nuisance during transport will arise.
- Proper maintenance of transport roads
- Proper maintenance of transport vehicles.
- Avoiding overloading of material
- Covering of loaded vehicles with tarpaulins sheet if warranted.
- Limiting of speed

11.4.11 WASTE MANAGEMENT:

Since the entire mined out material will be used there will not be any solid waste generation from this project. There is no process effluent generation from this mine. Hence no liquid waste is generated.

The hazardous waste generated in this mine will be stored in a separate storage area with impervious containers for waste oil, oil contaminated clothes, used lead acid batteries, scraps, tyre storage etc. It will be disposed through authorized recyclers or re-processors periodically. The hazardous wastes will be transported in accordance with the provisions of rules. By effective implementation of above said mitigation measures no major impact due to Hazardous waste is expected.

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.

11.5 ENVIRONMENTAL MONITORING PROGRAMME:

The monitoring schedules are planned for systematic study of various pollution levels with respect to air and water qualities, noise levels, etc. to ensure that they conform to the standards laid down by Environmental Protection Act and various statutory Limits.

Monitoring location and the frequency of monitoring shall be suitably modified in consultation with the nodal agency as per the actual requirements and prevailing conditions of the mine and environmental factors, as dictated from time to time, depending on the prevailing pollution levels, if required.

Towards EMP measures, Rs.14.9 lakhs is allocated under capital cost. Besides, Rs.13.55 lakhs will be spent under recurring cost. All the recurring cost of maintenance of pollution control measures, environmental monitoring etc., will be met from revenue. Further details of the capital and recurring cost of environmental management has been provided in in Table No. 10.1, Chapter-X.

11.6 ADDITIONAL STUDIES:

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

1. Public consultation of the project as per MoEF&CC mandates.
2. Risk Assessment
3. R&R Plan
4. Mine closure plan

This draft EIA/EMP report will be exposed to public consultation as per mandatory procedures through the District Collector and State Pollution Control Board officials after giving 30 days advance notice in two local newspapers about the scheduled date and time for conduct of the public hearing procedures. The opinions, concerns and objections of stakeholders will be recorded during the public hearing. All the public queries and the replies to the query by the project proponent and officials concerned will be recorded and incorporated in the EIA/EMP report for approval by SEIAA, Tamil Nadu.

Elaborate description in respect of Risk Assessment and Mine closure plan are given in **Chapter - VII**.

Although the individual lease area of this project is less than 5 Ha, the other existing and proposed quarries within the 500m radius along with this subject project works out to >5 Ha. Existing quarries of M.Deivam and S.Athithyan are present in the 500m radius. The baseline monitoring carried out for this project reflects the cumulative impact of these existing quarries. Considering that the lease period of the existing quarry quarries will be coming to an end shortly, the proposed quarry will serve as a replacement for the existing quarries to ensure meeting the present Roughstone demands.

11.7 CONCLUSION:

By systematic and scientific mining adhering to all the statutory norms and enforcing and strictly implementing the above said mitigation measures mentioned in this report, no adverse impact is envisaged. The proposed mining project will benefit this region in the fields of potential employment opportunities, improved per capita income for local people, improved social welfare facilities in respect of education, medical healthcare systems, etc. in its own way and also revenue to Government through royalty, taxes etc.

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CHAPTER - XII

DISCLOSURE OF CONSULTANTS ENGAGED

CHAPTER 12

DISCLOSURE OF CONSULTANTS ENGAGED

Creative Engineers & Consultants, Chennai – 600 059, is an **ISO 9001:2015** certified organization with **NABL** accredited testing laboratory and **NABET** accredited consultancy. Team of people are given below:

EXPERT NAME	QUALIFICATION	POSITION	EXPERIENCE
Mr. P. Giri	AMIE (Mining)	EIA Coordinator & Functional area Expert (AP,NV,HW),	Over 30 years of experience in EIA/EMP report, mine plan preparation, including modeling
Mr. K. Shankar	M.Sc (Geology). PGMEMG	Functional area Expert (GEO, HG, SHW, RH) & IBM approved RQP.	Over 25 years of experience in EIA/EMP report, Mine plan, hydrological report preparation
Dr. N. Radhakrishnan	M.Sc., M.Tech., Ph.D	Functional area Expert (Land use)	Over 25 years of experience in using the advanced spatial analysis techniques in GIS environment. Specialized in Spatial Information Technology and Applications (remote sensing, GIS)
Mr.S.S.Rajendran	M.Sc. (Pharmaceutical Chemistry)	Lab head	More than 9 years of experience in Environmental laboratory.
Mrs. V. Sivaranjani	M.Sc. (Env. Sci.)	Functional Area Expert (AQ,WP)	More than 8 years of experience in preparation of EIA / EMP reports
Mr. R. Babu raj	M.A (Sociology), B.Com(Y.L&Cost), ITI, Advance Diploma in	Functional Area Expert (Socio Economy)	Over 13 years of experience in dispersion modeling, computer applications. Specialized in CAD and computer software,

EXPERT NAME	QUALIFICATION	POSITION	EXPERIENCE
	Computer application		applications. 4years experience in the field of socio economy and its allied report preparation.
Mr. B. Govindaraman	B.Sc.	Field technician	Over 20 years of field monitoring & data collection experience
Dr.B.Swamynathan	M.Sc (Ecology & Environmental Sciences), M.Phill (Botany), Ph.D (Ecology & Environmental Sciences)	Team Member (EIA Coordinator)	More than 6 years of experience in Environment and allied fields.
Ms. G. Sandhya	B. Tech Chemical Engineering	Functional Area Associate (AQ, WP)	Over 4 years experience in preparation of EIA/EMP reports

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ANNEXURES

Annexures-1

ANNEXURE I

அனுப்புநர்

வெ.சசிகுமார், எம்.எஸ்.சி.,
உதவி இயக்குநர்,
புவியியல் மற்றும் சுரங்கத்துறை,
திண்டுக்கல்

பெறுநர்

தி/ள்.டி.பி அக்ரிகேட்ஸ் பிரைவேட் லிமிடெட்,
பழனி

ந.க.எண்.897/2019 (கனிமம்), நாள்: .02.2021

பொருள்: கனிமங்களும் சுரங்கங்களும் - சிறுவகைக் கனிமம் - திண்டுக்கல் மாவட்டம் - பழனி வட்டம், சின்னக்கலையம்புத்தூர் கிராமம், புல எண்.225/2ஏ-ல் 3.59.0 ஹெக்டேர் பட்டா நிலத்தில் கல்குவாரி செய்ய அனுமதி கோரி தி/ள்.டி.பி அக்ரிகேட்ஸ் பிரைவேட் லிமிடெட் நிறுவனத்தினர் விண்ணப்பித்தது - ஏற்பளிக்கப்பட்ட சுரங்கத்திட்டம் மற்றும் மாநில அளவிலான சுற்றுப்புறச் சூழல் தாக்க மதிப்பீட்டு ஆணையம் சான்றிதழ் அனுப்பக் கோருதல் - தொடர்பாக.

பார்வை:
1. அரசாணை எண்: 79, தொழில் (எம்.எம்.சி1)துறை, நாள்: 6.4.2015
2. அரசாணை எம்.எஸ்.எண்.169, தொழில்(எம்.எம்.சி1) துறை நாள்: 04.08.2020
3. தி/ள்.டி.பி அக்ரிகேட்ஸ் பிரைவேட் லிமிடெட், பழனி என்பவரது மனு நாள்: 05.12.2020
4. இவ்வலுவலக இதே எண்ணிட்ட கடிதம் நாள்:16.07.2020
5. பழனி வருவாய் கோட்டாட்சியர் கடித ந.க.எண்.672/2021/அ7 நாள்: 25.01.2021
6. உதவி இயக்குநர் (கனிமம்) திண்டுக்கல் புலத்தணிக்கை அறிக்கை நாள்: 12.02.2021

பார்வை 1-ல் காணும் மனுவில் 1959 ஆம் வருடத்திய தமிழ்நாடு சிறுகனிமச் சலுகை விதி எண்.19(1)ன்படி பழனி வட்டம், சின்னக்கலையம்புத்தூர் கிராமம், புல எண்.225/2ஏ-ல் 3.59.0 ஹெக்டேர் பட்டா நிலத்தில் கல் குவாரி செய்ய அனுமதி கோரி தி/ள்.டி.பி அக்ரிகேட்ஸ் பிரைவேட் லிமிடெட் நிறுவனத்தினர் மனுச் செய்துள்ளனர். மனுதாரர் மனுவுடன் விண்ணப்பக் கட்டணம் ரூ.1500/- செலுத்தியுள்ளார்.

தி/ள்.டி.பி அக்ரிகேட்ஸ் பிரைவேட் லிமிடெட் நிறுவனத்தினர் மனுவின்மீது பழனி வருவாய் கோட்டாட்சியரிடம் பார்வை 4-ல் காணும் கடிதத்தில் பரிந்துரை அறிக்கை கோரப்பட்டது. பார்வை 5-ல் காணும் கடிதத்தில் பழனி வருவாய் கோட்டாட்சியர் மனுதாருக்கு குத்தகை உரிமம் வழங்க பரிந்துரை செய்துள்ளார்.

பழனி வட்டம், சின்னக்கலையம்புத்தூர் கிராமம், புல எண்.225/2ஏ-ல் 3.59.0 ஹெக்டேர் நிலம் பட்டா எண்.1822-ன்படி தி/ள்.டி.பி அக்ரிகேட்ஸ் பிரைவேட் லிமிடெட் பெயரில் பட்டா தாக்கலாகியுள்ளது என்றும், கல்குவாரி செய்ய அனுமதி கேட்கும் நிலத்தின் வழியே ஓடை, வாய்க்கால் ஏதும் செல்லவில்லை என்றும், கல்குவாரி உரிமம் கோரும் நிலத்தினைச் சுற்றிலும் 300 மீட்டர் சுற்றளவில் குடியிருப்புகள், வீட்டுமனைகள், வழிபாட்டுதலங்கள் மற்றும் புராதான சின்னங்கள் ஏதும் இல்லை என்றும், 50 மீட்டர் தொலைவிற்குள் உயர்மின் அழுத்த கம்பிகள் மற்றும் குறைந்த மின் அழுத்த கம்பிகள், சாலை, வண்டிப்பாதை, ஓடை ஏதுமில்லை என்றும், கல்குவாரி உரிமம் கோரும் புல எண்.225/2ஏ பஞ்சமர்நிலமோ, ஒப்படை வழங்கப்பட்ட நிலமோ

அல்ல என்றும், கல்குவாரி உரிமம் கோரும் நிலத்திற்கு ஆட்சேபனைகள் இல்லை என மேற்படி கிராமத்தில் பொதுமக்கள் வாக்குமூலம் மற்றும் ஆ நோட்டீஸ் பெறப்பட்டுள்ளது என்றும்,கல்குவாரி அனுமதி கோரும் நிலத்தின் மேில் வழக்குகள் ஏதும் நிலுவையில் இல்லை என்றும், எனவே, தி/ள்.டி.வி அக்ரிகேட்ஸ் பிரைவேட் லிமிடெட் நிறுவனத்தினருக்கு பழனி வட்டம், சின்னக்கலையம்புத்தூர் கிராமம், புல எண்.225/2ஏ-ல் 3.59.0 ஹெக்டேர் நிலத்தில் கனிம விதிகளுக்குட்பட்டு கல் குவாரிப்பணி செய்ய அனுமதி வழங்கலாம் என பழனி வருவாய் கோட்டாட்சியர் தனது அறிக்கையில் தெரிவித்துள்ளார்.

மேற்படி புலங்களை இவ்வலுவலக களப்பணியாளர்களுடன் 12.12.2021 அன்று தணிக்கை செய்து பார்வை 8-ல் கண்டுள்ளபடி உதவி இயக்குநர் (கனிமம்) அறிக்கை சமர்ப்பித்துள்ளார்.

அவ்வறிக்கையில் மனுதாரர் மனுச்செய்துள்ள பழனி வட்டம், சின்னக்கலையம்புத்தூர் கிராமம், புல எண்.225/2ஏ-ல் 3.59.0 ஹெக்டேர் பட்டா நிலத்தில் கல்குவாரி பணி செய்ய மனுதாருக்கு கீழ்க்காண்டவாறு எந்தவ உரிமை உள்ளது என்றும்,

வ.எண்.	புல எண்	பரப்பளவு (ஹெக்டேரில்)	வகைப்பாடு	பட்டா எண்.	பட்டாதாரர் பெயர்
1.	225/2ஏ	3.59.0	புன்செய்	1822	தி/ள்.டி.வி அக்ரிகேட்ஸ் பிரைவேட் லிமிடெட்
மொத்தம்		**3.59.0**			

மனுதாரர் மனு செய்துள்ள புலமானது குவாரிப்பணி ஏதும் நடைபெறாத புலமாகும் என்றும், மனு செய்துள்ள புலத்தில் மண் படிந்து காணப்பட்டது என்றும், மனு செய்துள்ள புலத்தில் பாறைப்படிவங்கள் பரவலாகக் காணப்பட்டன என்றும், மனு செய்துள்ள புலத்தினை அருகில் தெற்குப் பகுதியில் கிழக்கிலிருந்து மேற்காக வண்டிப்பாதை செல்கிறது என்றும், மனு செய்துள்ள புலத்தில் பாறைப்படிவங்களின் தலப்போக்கு கிழ-மேற்கு திசையில் அமைந்துள்ளது என்றும், மேற்படி புலத்தில் 0-1.5 மீ வரை மண் படிந்துள்ளது என்றும், 1.5-2.5 மீ சிதைந்த பாறைகளும், 2.5மீ கீழே சார்னகைட் வகையைச் சார்ந்த பாறைகள் மெல்லிய இணைப்புகளுடன் காணப்பட்டது என்றும், மேற்படி புலத்தில் வெட்டியெடுக்கப்படும் கற்கள் ஜல்லி / உடைகற்கள் தயாரிக்க உகந்ததாக இருக்கும் என்றும்,

மனுதாரர் குவாரிப்பணி செய்ய விண்ணப்பித்துள்ள புலங்களின் நான்குமால் எல்லைகளின் விபரம்

வடக்கு: புல எண். 223, 224 - பட்டா நிலம்
தெற்கு: புல எண்: 225/2பி, 227 - பட்டா நிலம்
மேற்கு: புல எண். 225/1 - பட்டா நிலம்
கிழக்கு: புல எண்:224/2, 226 - பட்டா நிலம்

எனவே, மேற்கண்ட காரணங்களின் அடிப்படையில் மனுதாரர் தி/ள்.டி.வி அக்ரிகேட்ஸ் பிரைவேட் லிமிடெட் நிறுவனத்தினருக்கு பழனி வட்டம், சின்னக்கலையம்புத்தூர் கிராமம், புல எண்.225/2ஏ-ல் 3.59.0 ஹெக்டேர் பட்டா நிலத்தில் கல் குவாரி செய்ய நிபந்தனைகளுக்குட்பட்டு 1959 ஆம் வருடத்திய தமிழ்நாடு சிறுகனிமச் சலுகை விதி 19(1)ன்படி பத்து ஆண்டுகளுக்கு குத்தகை உரிமம் வழங்கலாம் என உதவி இயக்குநர் தனது அறிக்கையில் தெரிவித்துள்ளார்.

நிபந்தனைகள்:-

1. மனுதாரர் குவாரிப் பணி செய்யும் பகுதியினை சுற்றிலும் உள்ள பட்டா மற்றும் புறம்போக்கு நிலங்களுக்கு 7.5 மீட்டர் மற்றும் 10 மீட்டர் பாதுகாப்பு இடைவெளியாக விட வேண்டும்.
2. விண்ணப்ப புலங்களின் கிழக்கில் புல எண்.224 மற்றும் [illegible]-ல் செல்லும் குறைந்தழுத்த மின்கம்பிகளுக்கு 50 மீட்டர் பாதுகாப்பு இடைவெளி விட வேண்டும்.
3. விண்ணப்ப புலங்களின் வடக்கு மற்றும் கிழக்கில் [illegible] இரண்டு அங்கீகரிக்கப்படாத இரண்டு ஓட்டு வீடுகளுக்கு எல்லித பாதிப்பும் ஏற்படாவண்ணம் குறைந்த அளவு வெடி மருந்து பயன்படுத்தி குவாரிப்பணி செய்ய வேண்டும்.
4. குவாரிப்பணி செய்யும் பரப்பினைச் சுற்றி முழுவதும் Wire Fencing செய்திட வேண்டும்.

இந்நேர்வில் பார்வை 1-ல் காணும் அரசாணையின்படி சிறுகனிமக் குவாரிகளுக்கு 1959 ஆம் வருடத்திய தமிழ்நாடு சிறுகனிமச் சலுகை விதிகள் விதி எண்: 41 மற்றும் 42-ன்கீழ் குத்தகை உரிமம் வழங்கும் முன் மேற்படி குத்தகை உரிமம் கோரிய புலத்தில் குவாரிப்பணி செய்வதால் சுற்றுப்புறச் சூழலுக்கு மாசுபடுதல் தொடர்பாக, **மாநில அளவிலான சுற்றுப்புறச் சூழல் தாக்க மதிப்பீடு ஆணையத்தின் ஒப்புதல் பெற்று குவாரி குத்தகை உரிமம் வழங்க வேண்டும் என அறிவுறுத்தப்பட்டு நடைமுறையில் செயல்படுத்த தெளிவுரை வழங்கப்பட்டுள்ளது.**

1) பார்வை 1-ல் கண்ட அரசாணையில் பத்தி 7 மற்றும் 8-ல் குறிப்பிட்டபடி மாவட்ட ஆட்சித்தலைவர் மூலம் குத்தகை வழங்க கருதப்பட்ட பரப்பிற்கு வரைவு சுரங்கத்திட்ட அறிக்கை சமர்ப்பிக்க அறிவுறுத்திய கடிதம் குத்தகைதாரரால் பெறப்பட்ட நாளிலிருந்து மூன்று மாதத்திற்குள் சுரங்கத் திட்ட வரைபடம் மூன்று பிரதிகள் மாவட்ட அளவில் உள்ள துணை இயக்குநர்/உதவி இயக்குநர், புவியியல் மற்றும் சுரங்கத்துறை அலுவலகத்தில் சமர்ப்பிக்கப்பட வேண்டும்.

2) குத்தகைதாரர் மூலம் பெறப்பட்ட வரைவு சுரங்கத்திட்ட அறிக்கையினை துணை இயக்குநர் / உதவி இயக்குநர் புவியியல் மற்றும் சுரங்கத்துறை பார்வை 1-ல் பத்தி 7(IV)-ல் குறிப்பிட்டபடி ஆய்வு செய்து ஒப்புதல் செய்து குத்தகைதாருக்கு வழங்கவேண்டும்.

3) குத்தகைதாரர் ஏற்பளிக்கப்பட்ட வரைவு சுரங்கத்திட்ட அறிக்கை பெறப்பட்டவுடன் அத்துடன் மேலும் பார்வை 1-ல் தெரிவித்தபடி மாநில அளவிலான சுற்றுப்புற சூழல் செயல்விளைவு மதிப்பீடு ஆணையத்திலிருந்து சான்றிதழ் பெற கீழ்க்கண்ட ஆவணங்களை இணைத்து மாநில அளவிலான சுற்றுப்புறச் சூழல் தாக்க மதிப்பீடு ஆணைய அலுவலகத்திற்கு விண்ணப்பித்து அதன் அறிக்கை பெற்று சமர்ப்பிக்க வேண்டும்.

அ) படிவம்-I(Environment Impact Assessment Authority Notification 2006)
ஆ) An Environment impact Assessment Report
இ) An Approved Mining Plan, by the Competent Authority

4) மாநில அளவிலான சுற்றுப்புறச் சூழல் தாக்க மதிப்பீடு ஆணையத்தின் ஏற்பளிக்கப்பட்ட சுரங்கத்திட்டம் மற்றும் தடையில்லாச் சான்று பெற்ற பின்னர் அதனடிப்படையில் 1959 ஆம் வருடத்திய தமிழ்நாடு சிறுகனிமச் சலுகை விதி எண்.19(1) மற்றும் 20-ன்படி தினண்டுக்கல் புவியியல் மற்றும் சுரங்கத்துறை உதவி இயக்குநரால் மனுதாரருக்கு குத்தகை உரிமம் வழங்குவது குறித்து இறுதி ஆணை பிறப்பிக்க முடிவு எடுக்கப்பட வேண்டும்.

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மேற்கூறிய ஷரத்துக்களின்படி பழனி வருவாய் கோட்டாட்சியர் மற்றும் திண்டுக்கல் புவியியல் மற்றும் சுரங்கத்துறை உதவி இயக்குநர் ஆகியோரின் அறிக்கையின்படி திண்டுக்கல் மாவட்டம், பழனி வட்டம், சின்னக்கலையம்புத்தூர் கிராமம், புல எண்.225/2ஏ-ல் 1.49.0 ஹெக்டேர் பட்டா நிலத்தில் தி/ள்.டி.வி அக்ரிகேட்ஸ் பிரைவேட் லிமிடெட் நிறுவனத்தினருக்கு 1959 ஆம் வருடத்திய தமிழ்நாடு சிறுகனிமச் சலுகை விதி 19(1)-ன்படி திண்டுக்கல் புவியியல் மற்றும் சுரங்கத்துறை உதவி இயக்குநரால் பரிந்துரைக்கப்படும் காலத்திற்கு உடைகல், ஜல்லி குவாரி செய்ய கீழ்க்கண்ட நிபந்தனைகளுக்குட்பட்டு குத்தகை உரிமம் வழங்குவதற்குரிய (Precise Area Communication) பரப்பாக கருதப்படுகிறது.

நிபந்தனைகள்:-

1. மனுதாரர் குவாரிப் பணி செய்யும் பகுதியினை சுற்றிலும் உள்ள பட்டா மற்றும் புறம்போக்கு நிலங்களுக்கு 7.5 மீட்டர் மற்றும் 10 மீட்டர் பாதுகாப்பு இடைவெளியாக விட வேண்டும்.
2. விண்ணப்ப புலங்களின் கிழக்கில் புல எண்.224 மற்றும் 226-ல் செல்லும் குறைந்தழுத்த மின்சும்பிகளுக்கு 50 மீட்டர் பாதுகாப்பு இடைவெளி விடவேண்டும்.
3. விண்ணப்ப புலங்களின் வடக்கு மற்றும் கிழக்கில் உள்ள இரண்டு அங்கீகரிக்கப்படாத இரண்டு ஓட்டு வீடுகளுக்கு எவ்வித பாதிப்பும் இல்லாமல் குறைந்த அளவு வெடி மருந்து பயன்படுத்தி குவாரிப்பணி செய்ய வேண்டும்.
4. குவாரிப்பணி செய்யும் பரப்பினைச் சுற்றி முழுவதும் Wire Fencing செய்திட வேண்டும்.
5. 1959 ஆம் வருடத்திய தமிழ்நாடு சிறுகனிமச் சலுகை விதிகள் விதி எண். 36(1)-க்குட்பட்ட அனைத்து விதிகளும் பொருந்தும்.
6. மாநில அளவிலான சுற்றுப்புறச் சூழல் தாக்க மதிப்பீடு ஆணையத்தின் வழிமுறைகள் படி சுரங்கதிட்டம் சமர்ப்பிக்கப்பட வேண்டும்.
7. மாநில அளவிலான சுற்றுப்புறச் சூழல் தாக்க மதிப்பீடு ஆணையத்திடமிருந்து தடையில்லா சான்று பெற்று சமர்ப்பிக்கப்பட வேண்டும்.

மேலும் மேற்குறிப்பிட்ட விண்ணப்ப புலத்திற்கு வரைவு சுரங்கத்திட்ட அறிக்கையை இக்கடிதம் கிடைக்கப்பெற்ற நாளிலிருந்து மூன்று மாத காலத்திற்குள் தவறாது தாக்கல் செய்யப்படவேண்டும். மற்றும் ஏற்பளிக்கப்பட்ட வரைவு திட்ட அறிக்கை கிடைக்கப்பெற்ற பின்னர் மாநில அளவிலான சுற்றுப்புறச் சூழல் செயல் விழைவு மதிப்பீடு ஆணையத்தால் மேலொப்பம் வழங்கப்பட்ட சுரங்கத்திட்ட அறிக்கை மற்றும் ஆணையத்தின் தடையில்லாச் சான்று பெற்று உரிய காலத்திற்குள் சமர்ப்பிக்க குத்தகைதாரர் கேட்டுக் கொள்ளப்படுகிறார். தவறும்பட்சத்தில் உரிய விதிகளின்படி இறுதி முடிவு எடுக்கப்படும்.

உதவி இயக்குநர்,
புவியியல் மற்றும் சுரங்கத்துறை,
திண்டுக்கல்

நகல்:-
இயக்குநர்,
புவியியல் மற்றும் சுரங்கத்துறை,
கிண்டி, சென்னை - 32.

Annexure-2

From

V.Sasikumar, M.Sc.,
Assistant Director,
Geology and Mining,
Dindigul.

To

Tvl.T&P Aggregates Private Limited,
Chinnakalayamputhur,
Palani Taluk,
Dindigul

Roc.No. 897/2019 (Mines), dated: .05.2021

Sub: Mines and Minerals – Minor Mineral – Dindigul District – Tvl.T&P Agreegates has applied for rough stone quarry lease - over an extent of 3.59.0 hec in SF.No.225/2A of Chinna kalayamputhur Village, Palani Taluk, Dindigul District – Approval of Mining Plan - Regarding.

Ref:
1. Mining Plan submitted by Tvl.T&P Agreegates Private Ltd, Palani dated: 20.02.2021
2. This office letter No.897/2019 (Mines), dated:19.02.2021
3. The Commissioner of Geology and Mining, Chennai letter Rc No 3868/LC/2012, dated: 19.11.2012.
4. G.O (Ms) No 79, Ind (MMA1)Dept, dated:06.04.2015.

Vide reference 1st cited, the Mining Plan submitted by Tvl.T&P Agreegates Private Limited was examined in detail as per Guidelines given vide letter reference 3rd cited.

The Mining Plan has been prepared by RQP C.Natarajan, (RQP/MAS/004/87/A), as per Guidelines given by the Commissioner of Geology and Mining vide reference 3rd cited. The Geology and Mineral reserves are discussed in chapter 4. The estimated mineable reserve is **6,36,690 cum of Rough stone, 26,520 cum of Weathered Roak & 55,212 cum of Topsoil.**

The blasting techniques, Environmental Management Plan, and Mining Closure Plan are discussed in Chapter 6, 10 and 11. It is proposed that during the 5 years lease period, the applicant intends to excavate **4,00,510 cum of Rough stone, 26,520 cum of Weathered Roak & 55,212 cum of Topsoil.**

The RQP has stated that no interstate boundary is located at a distance of 10km from the lease applied area. The applied area does not fall under HACA notified villages.

In view of the above, and as per the power delegated vide Commissioner of Geology and Mining, Chennai letter Roc.No.3868/LC/2012, dated 19.11.2012 para 7(iv), I hereby approve the mining plan submitted by Tvl.T&P Agreegates for quarrying Rough stone over an extent of 3.59.0 hec in SF.No.225/2A of Chinna kalayamputhur Village, Palani Taluk, Dindigul District subject to the following conditions.

1. The applicant should leave 7.5m & 10m safety distance to the adjacent patta and Poamboke lands.
2. The applicant should leave 50m safety distance to the Low Tension Power line in SF.Nos.224 & 226 on the Eastern side of the applied area.
4. The applicant should obtain approval from SEIAA authority at Chennai before grant of lease.
5. That the mining plan is approved without prejudice to any other Law applicable to the quarry permission from time to time where such Laws are made by the State Government or any other authority.
6. This 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 Rule, 1959.
7. That the Mining plan is approved without prejudice to any other order or direction from any court of competent jurisdiction.
8. The applicant is directed to submit the application in Form-I as prescribed by the MoEF along with the approved Mining plan to the State Environment Impact Assessment Authority to issue Environment Clearance.
9. The applicant should use mild blasting while quarrying.

Encl: Two Copies of Mining Plan.

Assistant Director,
Geology and Mining,
Dindigul

Copy submitted to the Chairman, State Environment Impact Assessment Authority, Panagal Building, Saidapet, Chennai-15

Copy submitted to the Commissioner of Geology and Mining, Guindy, Chennai – 32

ANNEXURE IV

Annexure-3

தமிழக அரசு

வருவாய்த் துறை

நில உரிமை விபரங்கள் : இ. எண் 10(1) பிரிவு

Director Dept.of Geology and Mining. Collectorate Dindigul

மாவட்டம் : திண்டுக்கல் வட்டம் : பழனி

வருவாய் கிராமம் : சின்னக்கலையம்புத்தூர் பட்டா எண் :
1822

உரிமையாளர்கள் பெயர்

1. டீ அண்டு பி அக்ரிகேட்ஸ்பிரைவேட் லிமிடெட்காக மானேஜிங் டைரக்டர் ரிஜோ ஜோஸ் தராயில் -

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	
219	1B	0 - 30.40	0.84	--	--	--	--	2019/0103 /13/081722--2017 /13/21/0000575D -- 01-07-2019
220	-	2 - 35.50	5.06	--	--	--	--	2019/0103 /13/081722--- -- 01-07-2019
224	2	4 - 38.00	12.13	--	--	--	--	2018/0103 /13/067232--- -- 01-07-2019
224	3A2	0 - 20.31	0.57	--	--	--	--	2019/0103 /13/081722--2017 /13/21/000058SD -- 01-07-2019
224	3C2	0 - 9.30	0.26	--	--	--	--	2019/0103 /13/081722--2017 /13/21/000112SD -- 01-07-2019
225	2A	3 - 59.00	7.72	--	--	--	--	2019/0103 /13/081722--- -- 01-07-2019
225	2B	1 - 79.50	3.86	--	--	--	--	2019/0103 /13/081722--- -- 01-07-2019
225	3	1 - 94.50	4.18	--	--	--	--	2019/0103 /13/081722--- -- 01-07-2019
225	7	0 - 86.00	1.84	--	--	--	--	2019/0103 /13/081722--- -- 01-07-2019
225	8	0 - 90.00	1.94	--	--	--	--	2019/0103 /13/081722--- -- 01-07-2019

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Annexure-4

POPULATION BREAKUP & LITERACY LEVEL IN THE BUFFER ZONE

Sl.No	No. of Villages	Name of village	Rural / urban	HOUSE HOLDS	POPULATION			POPULATION BELOW 6 AGE GROUP			SCHEDULE CASTE			SCHEDULE TRIBE			LITRERATES			OTHERS		
					TOTAL	MALE	F.MALE	TOTAL	MALE	F.MALE	TOTAL	MALE	F.MALE	TOTAL	MALE	F. MALE	TOTAL	MALE	F.MALE	TOTAL	MALE	F.MALE
0-2 km,Palani Sub-District, Dindigul District																						
1	1	Thathanaickenpatti (N)	Rural	293	1011	512	499	90	43	47	322	161	161	0	0	0	604	337	267	407	175	232
2	2	Neikarapatti	Rural	297	1065	537	528	85	45	40	354	178	176	0	0	0	817	438	379	248	99	149
Palani Sub-District, Dindigul District																						
3	3	Chinnakalayamputhur (CT)	Urban	1475	5162	2537	2625	327	171	156	713	355	358	0	0	0	3941	2065	1876	1221	472	749
		total (A)		**2065**	**7238**	**3586**	**3652**	**502**	**259**	**243**	**1389**	**694**	**695**	**0**	**0**	**0**	**5362**	**2840**	**2522**	**1876**	**746**	**1130**
2-5 km,Palani Sub-District, Dindigul District																						
4	1	Chithraikulam	Rural	500	1749	846	903	124	69	55	308	152	156	0	0	0	1190	642	548	559	204	355
5	2	Sukkamanaickenpatti	Rural	518	2251	1203	1048	139	71	68	475	224	251	5	4	1	1692	963	729	559	240	319
6	3	Pethanaickenpatti	Rural	581	2164	1117	1047	192	109	83	771	397	374	0	0	0	1411	807	604	753	310	443
7	4	A-Kalayamputhur	Rural	3171	11746	5730	6016	1129	549	580	5784	2789	2995	3	1	2	7447	4067	3380	4299	1663	2636
8	5	R.Vadipatti (North)	Rural	188	694	352	342	40	19	21	128	65	63	0	0	0	466	257	209	228	95	133
9	6	Kavalapatti	Rural	1054	3867	1941	1926	395	205	190	1322	635	687	0	0	0	2157	1196	961	1710	745	965
Palani Sub-District, Dindigul District																						
10	1	Neikkarapatti (TP)	Urban	3113	11753	5811	5942	982	509	473	3104	1539	1565	115	62	53	8461	4579	3882	3292	1232	2060
		total (B)		**9125**	**34224**	**17000**	**17224**	**3001**	**1531**	**1470**	**11892**	**5801**	**6091**	**123**	**67**	**56**	**22824**	**12511**	**10313**	**11400**	**4489**	**6911**
5-10 km,Palani Sub-District, Dindigul District																						
11	1	Pushpathur	Rural	2436	8490	4302	4188	789	411	378	1306	679	627	0	0	0	5801	3221	2580	2689	1081	1608
12	2	Kolumakondan	Rural	539	1861	937	924	156	83	73	318	159	159	0	0	0	1199	675	524	662	262	400
13	3	Korikadavu	Rural	733	2610	1296	1314	206	100	106	1950	956	994	0	0	0	1502	871	631	1108	425	683
14	4	Thummalapatti	Rural	657	2194	1109	1085	168	83	85	526	258	268	0	0	0	1330	770	560	864	339	525
15	5	Pudur	Rural	122	470	235	235	47	23	24	262	129	133	0	0	0	281	160	121	189	75	114
16	6	Akkaraipatti	Rural	625	2195	1103	1092	157	79	78	316	161	155	0	0	0	1366	751	615	829	352	477
17	7	Thalaiyuthu	Rural	1722	5923	3008	2915	442	235	207	648	336	312	0	0	0	3883	2224	1659	2040	784	1256
18	8	Ayyampalayam	Rural	596	1901	977	924	124	63	61	377	208	169	0	0	0	1206	728	478	695	249	446
19	9	Manoor	Rural	1630	5746	2869	2877	498	234	264	2882	1436	1446	0	0	0	3457	1974	1483	2289	895	1394
20	10	Vilvathampatti	Rural	436	1525	751	774	137	68	69	481	227	254	0	0	0	955	541	414	570	210	360
21	11	Puliampatti	Rural	673	2395	1210	1185	238	130	108	502	239	263	0	0	0	1594	870	724	801	340	461
22	12	Kalickkanaickenpatti	Rural	506	1830	900	930	211	114	97	1088	529	559	0	0	0	1128	616	512	702	284	418
23	13	Kodaimangalam	Rural	2242	8554	4278	4276	849	420	429	3209	1615	1594	2	0	2	5777	3186	2591	2777	1092	1685
24	14	Pappampatti	Rural	2119	7988	3945	4043	804	393	411	3163	1572	1591	2	1	1	4839	2718	2121	3149	1227	1922
25	15	Velusamudram	Rural	155	555	289	266	46	30	16	106	56	50	0	0	0	336	196	140	219	93	126
26	16	Andipatti	Rural	1510	5506	2788	2718	513	268	245	1460	747	713	149	80	69	3067	1705	1362	2439	1083	1356
27	17	Cinnammapatti	Rural	87	321	180	141	26	14	12	3	2	1	0	0	0	203	121	82	118	59	59
28	18	Reddaiyambadi	Rural	5	23	14	9	1	1	0	11	7	4	0	0	0	16	11	5	7	3	4
29	19	Sitharevu	Rural	159	584	287	297	48	21	27	304	151	153	0	0	0	323	181	142	261	106	155
30	20	Thathanaickenpatti (South)	Rural	144	522	260	262	70	38	32	66	30	36	0	0	0	289	171	118	233	89	144
31	21	Iravimangalam	Rural	226	840	431	409	95	49	46	319	160	159	33	22	11	350	227	123	490	204	286
32	22	Periyammapatti	Rural	1497	5316	2701	2615	460	237	223	2531	1285	1246	99	50	49	3134	1849	1285	2182	852	1330
33	23	Tamaraikulam	Rural	290	1044	511	533	83	38	45	278	132	146	0	0	0	770	411	359	274	100	174
Palani Sub-District, Dindigul District																						
34	1	Palani (M)	Urban	19015	70467	34827	35640	6467	3283	3184	11679	5664	6015	160	85	75	55636	29102	26534	14831	5725	9106
35	2	Balasamudram (TP)	Urban	3802	14179	7108	7071	1354	682	672	4840	2411	2429	311	164	147	8534	4774	3760	5645	2334	3311
36	3	Sivagiripatti (CT)	Urban	4639	17306	8675	8631	1642	831	811	3189	1617	1572	23	11	12	13508	7133	6375	3798	1542	2256
Madathukulam Sub-District, Tiruppur District																						
37	1	Kuppampalayam	Rural	207	678	350	328	31	18	13	203	107	96	0	0	0	433	260	173	245	90	155
Madathukulam Sub-District, Tiruppur District																						
38	1	Sankaramanallur (TP)	Urban	2995	10283	5145	5138	886	485	401	2502	1240	1262	1	1	0	6599	3730	2869	3684	1415	2269
		total (C)		**49767**	**181306**	**90486**	**90820**	**16548**	**8431**	**8117**	**44519**	**22113**	**22406**	**780**	**414**	**366**	**127516**	**69176**	**58340**	**53790**	**21310**	**32480**
		Grand Total (A+B+C)		**60957**	**222768**	**111072**	**111696**	**20051**	**10221**	**9830**	**57800**	**28608**	**29192**	**903**	**481**	**422**	**155702**	**84527**	**71175**	**67066**	**26545**	**40521**

***Source: District Primary Cences Absract, Dindigul District of Tamilnadu State-2011**

Annexure-5

OCCUPATIONAL STRUCTURE IN THE BUFFER ZONE

Sl.No	No. of Villages	Name of village	Rural / urban	MAIN WORKERS		CULTIVATORS		AGRI LABOURS		HOUSE HOLD		OTHERS		MARGINAL WORKERS		NON WORKERS	
				MALE	F.MALE	MALE	F.MALE	MALE	F.MALE	MALE	F.MALE	MALE	F.MALE	MALE	F.MALE	MALE	F.MALE
0-2 km,Palani Sub-District, Dindigul District																	
1	1	Thathanaickenpatti (N)	**Rural**	169	101	98	59	10	24	6	3	55	15	195	175	148	223
2	2	Neikarapatti	**Rural**	293	232	75	56	151	146	0	0	67	30	42	40	202	256
Palani Sub-District, Dindigul District																	
3	3	Chinnakalayamputhur (CT)	**Urban**	1393	677	130	52	387	312	11	11	865	302	237	182	907	1766
		total (B)		**1855**	**1010**	**303**	**167**	**548**	**482**	**17**	**14**	**987**	**347**	**474**	**397**	**1257**	**2245**
2-5 km,Palani Sub-District, Dindigul District																	
4	1	Chithraikulam	**Rural**	552	257	225	36	223	199	2	0	102	22	4	7	290	639
5	2	Sukkamanaickenpatti	**Rural**	525	365	61	52	133	140	10	8	321	165	12	11	666	672
6	3	Pethanaickenpatti	**Rural**	677	472	46	24	231	249	87	41	313	158	35	65	405	510
7	4	A-Kalayamputhur	**Rural**	3408	2373	134	31	1834	1761	51	34	1389	547	49	56	2273	3587
8	5	R.Vadipatti (North)	**Rural**	203	124	78	49	66	48	0	0	59	27	30	33	119	185
9	6	Kavalapatti	**Rural**	1302	1070	274	200	824	797	4	3	200	70	35	56	604	800
Palani Sub-District, Dindigul District																	
10	1	Neikkarapatti (TP)	**Urban**	3430	1484	316	65	1274	926	84	36	1756	457	110	105	2271	4353
		total (B)		**10097**	**6145**	**1134**	**457**	**4585**	**4120**	**238**	**122**	**4140**	**1446**	**275**	**333**	**6628**	**10746**
5-10 km,Palani Sub-District, Dindigul District																	
11	1	Pushpathur	**Rural**	2637	1418	245	169	505	546	44	29	1843	674	76	82	1589	2688
12	2	Kolumakondan	**Rural**	614	570	216	211	192	229	113	95	93	35	15	22	308	332
13	3	Korikadavu	**Rural**	728	662	20	13	536	589	21	10	151	50	58	54	510	598
14	4	Thummalapatti	**Rural**	691	416	368	167	183	212	5	1	135	36	47	55	371	614
15	5	Pudur	**Rural**	155	9	11	0	116	8	2	0	26	1	0	0	80	226
16	6	Akkaraipatti	**Rural**	647	505	327	267	129	137	0	1	191	100	153	226	303	361
17	7	Thalaiyuthu	**Rural**	1867	1425	562	444	572	707	43	33	690	241	110	141	1031	1349
18	8	Ayyampalayam	**Rural**	657	490	255	169	210	236	105	56	87	29	16	53	304	381
19	9	Manoor	**Rural**	1790	1272	103	44	1069	1061	10	8	608	159	45	41	1034	1564
20	10	Vilvathampatti	**Rural**	412	331	177	155	49	60	0	3	186	113	91	129	248	314
21	11	Puliampatti	**Rural**	767	277	153	44	293	170	13	5	308	58	51	170	392	738
22	12	Kalickkanaickenpatti	**Rural**	565	380	96	60	175	271	2	1	292	48	4	1	331	549
23	13	Kodaimangalam	**Rural**	2280	1256	136	51	664	614	64	50	1416	541	408	409	1590	2611
24	14	Pappampatti	**Rural**	2388	1953	269	151	1599	1644	15	10	505	148	147	216	1410	1874
25	15	Velusamudram	**Rural**	162	147	129	120	17	12	1	3	15	12	60	61	67	58
26	16	Andipatti	**Rural**	1664	1348	266	164	1086	1092	17	9	295	83	189	156	935	1214
27	17	Cinnammapatti	**Rural**	120	100	74	58	43	41	0	0	3	1	2	1	58	40
28	18	Reddaiyambadi	**Rural**	12	7	0	0	12	7	0	0	0	0	0	0	2	2
29	19	Sitharevu	**Rural**	192	177	48	35	116	140	0	0	28	2	0	0	95	120
30	20	Thathanaickenpatti (South)	**Rural**	159	169	4	2	136	154	3	0	16	13	1	4	100	89
31	21	Iravimangalam	**Rural**	257	179	145	95	87	74	5	2	20	8	5	4	169	226
32	22	Periyammapatti	**Rural**	1399	1302	325	255	809	912	7	13	258	122	389	343	913	970
33	23	Tamaraikulam	**Rural**	337	191	46	2	209	170	5	3	77	16	2	3	172	339
Palani Sub-District, Dindigul District																	
34	1	Palani (M)	**Urban**	19839	6051	306	66	706	571	363	400	18464	5014	791	469	14197	29120
35	2	Balasamudram (TP)	**Urban**	4452	2862	338	116	2238	2024	57	189	1819	533	104	235	2552	3974
36	3	Sivagiripatti (CT)	**Urban**	4677	1868	147	75	444	404	62	60	4024	1329	304	304	3694	6459
Madathukulam Sub-District, Tiruppur District																	
37	1	Kuppampalayam	**Rural**	237	193	55	52	121	118	0	0	61	23	8	9	105	126
Madathukulam Sub-District, Tiruppur District																	
38	1	Sankaramanallur (TP)	**Urban**	3381	2236	697	360	1476	1486	158	92	1050	298	31	46	1733	2856
		total (C)		**53086**	**27794**	**5518**	**3345**	**13792**	**13689**	**1115**	**1073**	**32661**	**9687**	**3107**	**3234**	**34293**	**59792**
		Grand Total (A+B+C)		**65038**	**34949**	**6955**	**3969**	**18925**	**18291**	**1370**	**1209**	**37788**	**11480**	**3856**	**3964**	**42178**	**72783**

***Source: District Primary Cences Absract, Dindigul District of Tamilnadu State-2011**

EDUCATIONAL FACILITIES IN THE BUFFER ZONE

Sl.No	No. of Villages	Name of village	Educational Facilities (A(1)/ NA(2))	Govt Pre - Primary School (Nursery/LKG/UKG) (Numbers)	Govt Primary School (Numbers)	Govt Middle School (Numbers)	Govt Secondary School (Numbers)	Govt Senior Secondary School (Numbers)	Govt Arts and Science Degree College (Numbers)	Govt Engineering College (Numbers)	Govt Medicine College (Numbers)	Govt Management Institute (Numbers)	Govt Polytechnic (Numbers)	Govt Vocational Training School/ITI (Numbers)	Government Non Formal Training Centre (Numbers)	Government School For Disabled (Numbers)
0-2 km,Palani Sub-District, Dindigul District																
1	1	Thathanaickenpatti (N)	**1**	1	1	0	0	0	0	0	0	0	0	0	0	0
2	2	Neikarapatti	**1**	1	0	0	0	0	0	0	0	0	0	0	0	0
		total (B)	**2**	**2**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
2-5 km,Palani Sub-District, Dindigul District																
3	1	Chithraikulam	**1**	2	2	0	0	0	0	0	0	0	0	0	0	0
4	2	Sukkamanaickenpatti	**1**	1	2	0	0	0	0	0	0	0	0	0	0	0
5	3	Pethanaickenpatti	**1**	1	1	1	0	0	0	0	0	0	0	0	0	0
6	4	A-Kalayamputhur	**1**	1	6	1	1	0	0	0	0	0	0	0	0	0
7	5	R.Vadipatti (North)	**1**	1	1	0	0	0	0	0	0	0	0	0	0	0
8	6	Kavalapatti	**1**	4	2	2	0	0	0	0	0	0	0	0	0	0
		total (B)	**6**	**10**	**14**	**4**	**1**	0	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
5-10 km,Palani Sub-District, Dindigul District																
9	1	Pushpathur	**1**	2	5	1	0	0	0	0	0	0	0	0	0	0
10	2	Kolumakondan	**1**	2	2	0	0	0	0	0	0	0	0	0	0	0
11	3	Korikadavu	**1**	2	1	0	0	0	0	0	0	0	0	0	0	0
12	4	Thummalapatti	**1**	2	2	0	0	0	0	0	0	0	0	0	0	0
13	5	Pudur	**1**	0	0	0	0	0	0	0	0	0	0	0	0	0
14	6	Akkaraipatti	**1**	2	1	0	0	0	0	0	0	0	0	0	0	0
15	7	Thalaiyuthu	**1**	8	8	1	1	0	0	0	0	0	0	0	0	0
16	8	Ayyampalayam	**1**	2	1	1	0	0	0	0	0	0	0	0	0	0
17	9	Manoor	**1**	5	1	1	1	0	0	0	0	0	0	0	0	0
18	10	Vilvathampatti	**1**	2	2	2	0	0	0	0	0	0	0	0	0	0
19	11	Puliampatti	**1**	1	1	0	0	0	0	0	0	0	0	0	0	0
20	12	Kalickkanaickenpatti	**1**	1	1	1	0	0	0	0	0	0	0	0	1	0
21	13	Kodaimangalam	**1**	8	2	1	0	0	0	0	0	0	0	0	0	0
22	14	Pappampatti	**1**	4	3	3	1	1	0	0	0	0	0	0	0	0
23	15	Velusamudram	**1**	1	1	0	0	0	0	0	0	0	0	0	0	0
24	16	Andipatti	**1**	1	1	1	0	0	0	0	0	0	0	0	0	0
25	17	Cinnammapatti	**2**	0	0	0	0	0	0	0	0	0	0	0	0	0
26	18	Reddaiyambadi	**2**	0	0	0	0	0	0	0	0	0	0	0	0	0
27	19	Sitharevu	**1**	1	1	0	0	0	0	0	0	0	0	0	0	0
28	20	Thathanaickenpatti (South)	**1**	1	1	0	0	0	0	0	0	0	0	0	0	0
29	21	Iravimangalam	**1**	1	2	0	0	0	0	0	0	0	0	0	0	0
30	22	Periyammapatti	**1**	7	7	2	0	0	0	0	0	0	0	0	1	0
31	23	Tamaraikulam	**1**	1	1	1	0	0	0	0	0	0	0	0	0	0
Madathukulam Sub-District, Tiruppur District																
32	1	Kuppampalayam	**1**	1	1	0	0	0	0	0	0	0	0	0	1	0
		total (C)	**26**	**55**	**45**	**15**	**3**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**3**	**0**
		Grand Total (A+B+C)	**34**	**67**	**60**	**19**	**4**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**3**	**0**

***Source: District Primary Cences Absract, Dindigul District of Tamilnadu State-2011**

Annexure-7

MEDICAL FACILITIES IN THE BUFFER ZONE

Sl.No	No. of Villages	Name of village	Medical Facilities (A(1)/NA(2))	Community Health Centre (Numbers)	Primary Health Centre (Numbers)	Primary Heallth Sub Centre (Numbers)	Maternity And Child Welfare Centre (Numbers)	TB Clinic (Numbers)	Hospital Allopathic (Numbers)	Hospiltal Alternative Medicine (Numbers)	Dispensary (Numbers)	Veterinary Hospital (Numbers)	Mobile Health Clinic (Numbers)	Family Welfare Centre (Numbers)
0-2 km,Palani Sub-District, Dindigul District														
1	1	Thathanaickenpatti (N)	**2**	0	0	0	0	0	0	0	0	0	0	0
2	2	Neikarapatti	**2**	0	1	1	1	1	0	0	1	1	0	1
		total (B)	**4**	**0**	**1**	**1**	**1**	**1**	**0**	**0**	**1**	**1**	**0**	**1**
2-5 km,Palani Sub-District, Dindigul District														
3	1	Chithraikulam	**2**	0	0	0	0	0	0	0	0	0	0	0
4	2	Sukkamanaickenpatti	**2**	0	0	0	0	0	0	0	0	0	0	0
5	3	Pethanaickenpatti	**2**	0	0	0	0	0	0	0	0	0	0	0
6	4	A-Kalayamputhur	**1**	0	2	2	2	2	0	0	2	0	0	2
7	5	R.Vadipatti (North)	**2**	0	0	0	0	0	0	0	0	0	0	0
8	6	Kavalapatti	**1**	0	0	1	0	0	0	0	0	1	0	0
		total (B)	**10**	**0**	**2**	**3**	**2**	**2**	**0**	**0**	**2**	**1**	**0**	**2**
5-10 km,Palani Sub-District, Dindigul District														
9	1	Pushpathur	**1**	0	0	1	0	0	0	0	0	0	0	0
10	2	Kolumakondan	**2**	0	0	0	0	0	0	0	0	0	0	0
11	3	Korikadavu	**1**	0	0	1	0	0	0	0	0	0	0	0
12	4	Thummalapatti	**1**	0	0	1	0	0	0	0	0	1	0	0
13	5	Pudur	**2**	0	0	0	0	0	0	0	0	0	0	0
14	6	Akkaraipatti	**1**	0	0	0	0	0	0	0	0	1	0	0
15	7	Thalaiyuthu	**1**	0	0	1	1	0	0	0	0	1	0	0
16	8	Ayyampalayam	**1**	0	0	1	0	0	0	0	0	0	0	0
17	9	Manoor	**1**	0	0	1	0	0	0	0	0	1	0	0
18	10	Vilvathampatti	**2**	0	0	0	0	0	0	0	0	0	0	0
19	11	Puliampatti	**2**	0	0	0	0	0	0	0	0	0	0	0
20	12	Kalickkanaickenpatti	**1**	0	0	1	1	0	0	0	0	0	0	0
21	13	Kodaimangalam	**1**	0	0	1	0	0	0	0	0	0	0	0
22	14	Pappampatti	**1**	1	1	1	1	1	0	0	1	1	0	1
23	15	Velusamudram	**2**	0	0	0	0	0	0	0	0	0	0	0
24	16	Andipatti	**1**	0	0	1	0	0	0	0	0	1	0	0
25	17	Cinnammapatti	**1**	0	1	1	1	1	0	0	1	0	0	1
26	18	Reddaiyambadi	**2**	0	0	0	0	0	0	0	0	0	0	0
27	19	Sitharevu	**2**	0	0	0	0	0	0	0	0	0	0	0
28	20	Thathanaickenpatti (South)	**2**	0	0	0	0	0	0	0	0	0	0	0
29	21	Iravimangalam	**2**	0	0	0	0	0	0	0	0	0	0	0
30	22	Periyammapatti	**1**	0	0	3	0	0	0	0	0	0	0	0
31	23	Tamaraikulam	**1**	0	0	1	0	0	0	0	0	0	0	0
Madathukulam Sub-District, Tiruppur District														
32	1	Kuppampalayam	**2**	0	0	0	0	0	0	0	0	0	0	0
		total (C)	**34**	**1**	**2**	**15**	**4**	**2**	**0**	**0**	**2**	**6**	**0**	**2**
		Grand Total (A+B+C)	**48**	**1**	**5**	**19**	**7**	**5**	**0**	**0**	**5**	**8**	**0**	**5**

***Source: District Primary Cences Absract, Dindigul District of Tamilnadu State-2011**

Note : **A: Available, NA- Not Available**

Annexure-8

INFRASTRUCTURAL FACILITIES IN THE BUFFER ZONE

Sl.No	No. of Villages	Name of village	Tap Water-Treated	Covered Well	Hand Pump	Tube Wells/Borehole	Spring	River/Canal	Tank/Pond/Lake	Post Office	Sub Post Office	Post And Telegraph Office	Telephone (landlines)	Mobile Phone Coverage	Public Bus Service	Railway Station	Commercial Bank	Cooperative Bank	Agricultural Credit Societies
0-2 km,Palani Sub-District, Dindigul District																			
1	1	Thathanaickenpatti (N)	1	2	2	2	2	2	2	2	1	2	1	1	1	2	2	2	2
2	2	Neikarapatti	1	1	2	1	2	2	2	2	1	2	1	1	1	2	1	1	1
2-5 km,Palani Sub-District, Dindigul District																			
3	1	Chithraikulam	1	1	2	1	2	2	2	2	2	2	1	1	1	2	2	1	1
4	2	Sukkamanaickenpatti	1	1	2	1	2	2	2	2	2	2	1	1	1	2	2	2	2
5	3	Pethanaickenpatti	1	2	2	2	2	2	2	2	2	2	1	1	1	2	2	2	2
6	4	A-Kalayamputhur	1	2	1	1	2	2	2	2	1	2	1	1	1	2	2	1	1
7	5	R.Vadipatti (North)	1	2	2	1	2	2	2	2	2	2	1	1	1	2	2	2	2
8	6	Kavalapatti	1	2	2	1	2	2	2	2	1	2	1	1	1	2	2	2	2
5-10 km,Palani Sub-District, Dindigul District																			
9	1	Pushpathur	1	2	2	1	2	1	2	2	1	2	1	1	1	1	1	1	1
10	2	Kolumakondan	1	2	2	1	2	2	2	2	2	2	1	1	1	2	2	2	2
11	3	Korikadavu	1	2	2	2	2	2	2	2	2	2	1	1	1	2	2	2	2
12	4	Thummalapatti	1	2	1	1	2	2	2	2	1	2	1	1	1	2	2	1	2
13	5	Pudur	2	2	2	2	2	2	2	2	2	2	2	1	2	2	2	2	2
14	6	Akkaraipatti	1	1	2	1	2	1	2	2	2	2	1	1	2	2	2	2	2
15	7	Thalaiyuthu	1	1	1	1	1	2	2	2	1	2	1	1	1	1	1	1	1
16	8	Ayyampalayam	1	2	2	1	2	2	2	2	1	2	1	1	1	2	2	2	2
17	9	Manoor	1	1	2	1	2	2	2	2	1	2	1	1	1	2	1	1	1
18	10	Vilvathampatti	1	1	2	1	1	2	2	2	2	2	1	1	1	2	2	2	2
19	11	Puliampatti	1	2	1	1	2	2	2	2	1	2	1	1	1	2	2	1	1
20	12	Kalickkanaickenpatti	1	1	2	2	2	2	2	2	2	2	1	1	1	2	2	2	2
21	13	Kodaimangalam	1	1	1	1	2	2	2	2	1	2	1	1	2	2	2	2	2
22	14	Pappampatti	1	2	2	2	2	2	2	2	1	2	1	1	1	2	2	1	1
23	15	Velusamudram	1	2	2	1	2	2	2	2	2	2	1	1	1	2	2	2	2
24	16	Andipatti	1	2	2	2	2	2	2	2	1	2	1	1	1	2	2	1	1
25	17	Cinnammapatti	1	2	2	2	2	2	2	2	1	2	1	1	2	2	2	2	2
26	18	Reddaiyambadi	2	2	2	2	2	2	2	2	2	2	2	1	2	2	2	2	2
27	19	Sitharevu	2	2	2	1	2	2	2	2	2	2	1	1	1	2	2	2	2
28	20	Thathanaickenpatti (South)	1	1	2	1	2	2	2	2	2	2	2	1	1	2	2	2	2
29	21	Iravimangalam	2	2	1	2	2	1	2	2	2	2	1	1	1	2	2	2	2
30	22	Periyammapatti	1	1	1	1	2	2	2	2	1	2	1	1	1	2	2	2	2
31	23	Tamaraikulam	1	2	2	1	2	1	2	1	2	1	1	1	1	2	2	2	2
Madathukulam Sub-District, Tiruppur District																			
32	1	Kuppampalayam	1	1	1	1	2	2	2	2	2	2	1	1	1	2	2	2	2

***Source: District Primary Cences Absract, Dindigul District of Tamilnadu State-2011**

Note : **A: Available, NA- Not Available, A(1), NA(2)**

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DEPARTMENT OF INDUSTRIES AND COMMERCE REGISTERED COMPANY

AMBIENT AIR QUALITY

Project : **Rough Stone and Jelly Quarry Tvl. T& P Aggregates Private Limited**
Name of the Location : **Near Mine Lease Area**
Station Code : **A1**

SL.NO	DATE	PM10	PM2.5	SO2	NO2
1	07.03.2022	48.5	21.8	5.6	8.2
2	08.03.2022	44.9	20.2	4.7	7.3
3	18.03.2022	41.3	18.6	3.8	6.4
4	19.03.2022	45.3	20.4	4.8	7.4
5	21.03.2022	40.1	17.9	3.5	6.1
6	22.03.2022	43.7	19.7	4.4	7.0
7	01.04.2022	42.9	19.3	4.2	6.8
8	02.04.2022	47.7	21.5	5.4	8.0
9	04.04.2022	46.5	20.9	5.1	7.7
10	05.04.2022	42.1	18.9	4.0	6.6
11	15.04.2022	40.5	18.2	3.6	6.2
12	16.04.2022	44.1	19.8	4.5	7.1
13	18.04.2022	49.3	22.2	5.7	8.3
14	19.04.2022	44.5	20.1	4.6	7.2
15	29.04.2022	40.9	18.4	3.7	6.3
16	30.04.2022	43.3	19.5	4.3	6.9
17	02.05.2022	46.1	20.7	5.0	7.6
18	03.05.2022	42.5	19.1	4.1	6.7
19	13.05.2022	50.2	22.6	5.8	8.4
20	14.05.2022	47.3	21.3	5.3	7.9
21	16.05.2022	46.9	21.1	5.2	7.8
22	17.05.2022	41.7	18.8	3.9	6.5
23	27.05.2022	48.1	21.6	5.5	8.1
24	28.05.2022	45.7	20.6	4.9	7.5
	MIN	**40.1**	**17.9**	**3.5**	**6.1**
	AVE	**44.8**	**20.1**	**4.7**	**7.3**
	MAX	**50.2**	**22.6**	**5.8**	**8.4**

Note: BDL – Below Detectable Limit, DL: Detectable Limit.

Prepared by

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e-mail : cecgiri@yahoo.com, web : www.creativeengineers.co.in

AMBIENT AIR QUALITY

Project : **Rough Stone and Jelly Quarry Tvl. T& P Aggregates Private Limited**
Name of the Location : **Samathuvapuram Village**
Station Code : **A2**

SL.NO	DATE	PM10	PM2.5	SO2	NO2
1	07.03.2022	48.7	22.4	5.4	7.6
2	08.03.2022	43.5	20.1	4.5	6.5
3	18.03.2022	50.9	23.4	5.5	7.9
4	19.03.2022	47.1	21.7	5.2	7.4
5	21.03.2022	47.9	22.1	5.3	7.5
6	22.03.2022	45.9	21.1	5.0	7.1
7	01.04.2022	41.1	18.9	4.0	6.0
8	02.04.2022	45.1	20.7	4.8	7.0
9	04.04.2022	44.3	20.4	4.6	6.8
10	05.04.2022	41.9	19.3	4.1	6.2
11	15.04.2022	49.1	22.6	5.4	7.7
12	16.04.2022	46.7	21.5	5.1	7.3
13	18.04.2022	40.7	18.7	3.9	5.9
14	19.04.2022	43.1	19.8	4.4	6.5
15	29.04.2022	48.3	22.2	5.3	7.5
16	30.04.2022	46.3	21.3	5.1	7.2
17	02.05.2022	42.7	19.6	4.3	6.4
18	03.05.2022	45.5	20.9	4.9	7.1
19	13.05.2022	44.7	20.6	4.7	6.9
20	14.05.2022	42.3	19.5	4.2	6.3
21	16.05.2022	41.5	19.1	4.0	6.1
22	17.05.2022	43.9	20.2	4.5	6.7
23	27.05.2022	49.5	22.8	5.5	7.8
24	28.05.2022	47.5	21.9	5.2	7.4
	MIN	**40.7**	**18.7**	**3.9**	**5.9**
	AVE	**45.3**	**20.9**	**4.8**	**7.0**
	MAX	**50.9**	**23.4**	**5.5**	**7.9**

Note: BDL – Below Detectable Limit, DL: Detectable Limit.

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DEPARTMENT OF INDUSTRIES AND COMMERCE REGISTERED COMPANY

AMBIENT AIR QUALITY

Project : **Rough Stone and Jelly Quarry Tvl. T& P Aggregates Private Limited**
Name of the Location : **Neykarapatti Village**
Station Code : **A3**

SL.NO	DATE	PM10	PM2.5	SO2	NO2
1	09.03.2022	61.9	28.8	6.6	9.3
2	10.03.2022	59.5	27.7	6.4	8.8
3	16.03.2022	55.9	25.9	6.1	8.2
4	17.03.2022	52.3	24.3	5.7	7.6
5	23.03.2022	49.3	22.9	5.2	7.1
6	24.03.2022	54.7	25.4	6.1	8.1
7	30.03.2022	61.3	28.5	6.6	9.2
8	31.03.2022	57.1	26.6	6.2	8.4
9	06.04.2022	58.3	27.1	6.3	8.6
10	07.04.2022	51.7	24.1	5.6	7.5
11	13.04.2022	53.5	24.9	5.9	7.8
12	14.04.2022	50.5	23.5	5.4	7.3
13	20.04.2022	55.3	25.7	6.1	8.1
14	21.04.2022	59.8	27.8	6.5	8.9
15	27.04.2022	49.9	23.2	5.3	7.2
16	28.04.2022	54.1	25.2	5.9	7.9
17	04.05.2022	51.1	23.8	5.5	7.4
18	05.05.2022	52.9	24.6	5.8	7.7
19	11.05.2022	60.7	28.2	6.5	9.1
20	12.05.2022	57.7	26.8	6.2	8.5
21	18.05.2022	62.5	29.1	6.7	9.4
22	19.05.2022	58.9	27.4	6.3	8.7
23	25.05.2022	56.5	26.3	6.1	8.3
24	26.05.2022	60.1	27.9	6.5	9.0
	MIN	**49.3**	**22.9**	**5.2**	**7.1**
	AVE	**56.1**	**26.1**	**6.1**	**8.3**
	MAX	**62.5**	**29.1**	**6.7**	**9.4**

Note: BDL – Below Detectable Limit, DL: Detectable Limit.

Prepared by

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DEPARTMENT OF INDUSTRIES AND COMMERCE REGISTERED COMPANY

AMBIENT AIR QUALITY

Project : **Rough Stone and Jelly Quarry Tvl. T& P Aggregates Private Limited**
Name of the Location : **R. Vadipatti Village**
Station Code : **A4**

SL.NO	DATE	PM10	PM2.5	SO2	NO2
1	09.03.2022	52.1	24.2	5.9	7.7
2	10.03.2022	48.8	22.7	5.2	6.9
3	16.03.2022	56.5	26.3	6.5	8.6
4	17.03.2022	54.1	25.2	6.2	8.2
5	23.03.2022	52.5	24.4	6.1	7.9
6	24.03.2022	54.8	25.5	6.3	8.4
7	30.03.2022	55.2	25.7	6.3	8.5
8	31.03.2022	49.2	22.9	5.3	7.1
9	06.04.2022	47.2	21.9	4.8	6.5
10	07.04.2022	50.8	23.6	5.7	7.4
11	13.04.2022	52.4	24.4	6.2	7.8
12	14.04.2022	49.9	23.2	5.5	7.2
13	20.04.2022	55.6	25.9	6.4	8.5
14	21.04.2022	53.2	24.7	6.1	8.2
15	27.04.2022	49.6	23.1	5.4	7.1
16	28.04.2022	54.4	25.3	6.2	8.3
17	04.05.2022	51.2	23.8	5.8	7.5
18	05.05.2022	47.6	22.1	4.9	6.6
19	11.05.2022	50.4	23.4	5.6	7.3
20	12.05.2022	48.4	22.5	5.1	6.8
21	18.05.2022	56.2	26.1	6.4	8.6
22	19.05.2022	53.6	24.9	6.1	8.1
23	25.05.2022	51.6	24.0	5.9	7.6
24	26.05.2022	48.1	22.4	5.1	6.7
	MIN	**47.2**	**21.9**	**4.8**	**6.5**
	AVE	**51.8**	**24.1**	**5.8**	**7.6**
	MAX	**56.5**	**26.3**	**6.5**	**8.6**

Note: BDL – Below Detectable Limit, DL: Detectable Limit.

prepared by

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AMBIENT AIR QUALITY

Project : **Rough Stone and Jelly Quarry Tvl. T& P Aggregates Private Limited**
Name of the Location : **Tatanayakkanpatti Village**
Station Code : **A5**

SL.NO	DATE	PM10	PM2.5	SO2	NO2
1	11.03.2022	48.1	22.1	5.2	7.6
2	12.03.2022	50.1	23.0	5.9	8.3
3	14.03.2022	52.1	24.0	6.4	8.8
4	15.03.2022	49.5	22.8	5.6	8.0
5	25.03.2022	46.1	21.2	4.7	7.1
6	26.03.2022	44.5	20.5	4.3	6.7
7	28.03.2022	50.9	23.4	6.1	8.5
8	29.03.2022	45.7	21.0	4.6	7.0
9	08.04.2022	44.1	20.3	4.2	6.6
10	09.04.2022	47.7	21.9	5.1	7.5
11	11.04.2022	50.5	23.2	6.0	8.4
12	12.04.2022	48.5	22.3	5.3	7.7
13	22.04.2022	52.5	24.2	6.5	8.9
14	23.04.2022	49.6	22.8	5.7	8.1
15	25.04.2022	51.7	23.8	6.3	8.7
16	26.04.2022	48.9	22.5	5.4	7.8
17	06.05.2022	47.3	21.8	5.0	7.4
18	07.05.2022	49.9	23.0	5.8	8.2
19	09.05.2022	46.5	21.4	4.8	7.2
20	10.05.2022	45.3	20.8	4.5	6.9
21	20.05.2022	46.9	21.6	4.9	7.3
22	21.05.2022	44.9	20.7	4.4	6.8
23	23.05.2022	51.3	23.6	6.2	8.6
24	24.05.2022	49.3	22.7	5.5	7.9
	MIN	**44.1**	**20.3**	**4.2**	**6.6**
	AVE	**48.4**	**22.3**	**5.4**	**7.8**
	MAX	**52.5**	**24.2**	**6.5**	**8.9**

Note: BDL – Below Detectable Limit, DL: Detectable Limit.

Prepared by

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WATER QUALITY DATA

S. No.	Parameter	Unit	W 1	W 2	W 3	W 4	*Permissible Limits
1	pH	-	8.25	8.08	8.24	8.02	6.5-8.5
2	Electrical Conductivity	µmhos/cm	354.7	2082	517.4	961.3	-
3	Odor	-	AGREEABLE	AGREEABLE	AGREEABLE	AGREEABLE	AGREEABLE
4	Turbidity	NTU	<1	<1	<1	<1	5.0
5	Total Hardness as $CaCO_3$	mg/L	122	561	223	349	600
6	Calcium Hardness $CaCO_3$	mg/L	88.2	329	123	216	-
7	Magnesium Hardness $CaCO_3$	mg/L	33.3	231	100	133	-
8	Calcium Ca	mg/L	35.3	132	49.4	86.2	200
9	Magnesium Mg	mg/L	8.0	55.5	24.0	32	100
10	Alkalinity $CaCO_3$	mg/L	144	248	207	225	600
11	Chloride Cl^-	mg/L	29.4	479	59.7	108	1000
12	Sulphate SO_4^{2}	mg/L	30.3	345	21.4	84.7	400
13	Iron Fe	mg/L	BDL(D.L - 0.01)	0.09	0.04	0.05	0.3
14	Nitrate NO_3	mg/L	BDL(D.L - 1.0)	2.15	1.86	2.73	45
15	Fluoride F	mg/L	0.11	0.42	0.19	0.32	1.5
16	Total Dissolved Solids	mg/L	215	1250	312	580	2000
17	Free Residual Chlorine Cl^-	mg/L	BDL(D.L-0.2)	BDL(D.L-0.2)	BDL(D.L-0.2)	BDL(D.L-0.2)	1.0
18	Manganese Mn	mg/L	BDL(D.L-0.05)	BDL(D.L-0.05)	BDL(D.L-0.05)	BDL(D.L-0.05)	0.3

Note: * The water quality of the collected ground water samples were found to be within the prescribed permissible limits of IS: 10500:2012 Norms for Drinking in the absence of an alternative source.

Location Name:

Ground Water	
W1	Near Mine Lease Area(BW)
W2	Neykarapatti Village(BW)
W3	R.Vadipatti Village(BW)
W4	Tatanayakkanpatti Village (BW)

CREATIVE ENGINEERS & CONSULTANTS CHENNAI 600 059

Prepared by

Annexure-11

LAND USE PATTERN OF THE STUDY AREA AS PER CENSUS 2011

Sl.No	No. of Villages	Name of village	Total Geographical Area (in Hectares)	Forest Area (in Hectares)	Area under Non-Agricultural Uses (in Hectares)	Barren & Un-cultivable Land Area (in Hectares)	Permanent Pastures and Other Grazing Land Area (in Hectares)	Land Under Miscellaneous Tree Crops etc. Area (in Hectares)	Culturable Waste Land Area (in Hectares)	Fallows Land other than Current Fallows Area (in Hectares)	Current Fallows Area (in Hectares)	Total Unirrigated Land Area (in Hectares)	Area Irrigated by Source (in Hectares)
0-2 km,Palani Sub-District, Dindigul District													
1	1	Thathanaickenpatti (N)	950.2	0	262.5	365.5	0	0	0	0	194.8	124.5	2.9
2	2	Neikarapatti	545.73	0	0	78.91	0	0	0.02	0	11.91	356	98.89
		total (B)	**1495.93**	**0**	**262.5**	**444.41**	**0**	**0**	**0.02**	**0**	**206.71**	**480.5**	**101.79**
2-5 km,Palani Sub-District, Dindigul District													
3	1	Chithraikulam	940.16	0	94.67	6.28	19.85	32.49	0.25	74.9	57.44	130.92	523.36
4	2	Sukkamanaickenpatti	635.33	0	90.42	4.65	33.88	12.33	0	37.17	10.05	136.55	310.28
5	3	Pethanaickenpatti	458.02	0	66.99	0.2	39.15	2.15	0.85	26.59	31.04	168.71	122.34
6	4	A-Kalayamputhur	1412.67	0	216.79	4.89	61.03	15.24	24.09	112.71	91.43	34.17	852.32
7	5	R.Vadipatti (North)	787.6	0	61.23	0	0	0	61.11	0.35	0	512.85	152.06
8	6	Kavalapatti	512.1	0	0	0	0	0	58.3	0	50.3	188.1	215.4
		total (B)	**4745.88**	**0**	**530.1**	**16.02**	**153.91**	**62.21**	**144.6**	**251.72**	**240.26**	**1171.3**	**2175.76**
5-10 km,Palani Sub-District, Dindigul District													
9	1	Pushpathur	1627.27	0	200.66	1.24	68	22	0	200.79	195.1	415.14	524.34
10	2	Kolumakondan	1628.77	0	140.64	25.46	0	0	80.31	521.74	44.29	216.33	600
11	3	Korikadavu	557.08	0	68.87	0	0	0	180.5	0	109.26	0	198.45
12	4	Thummalapatti	938.82	0	78.17	0	0	0	11.88	42.84	217	0	588.93
13	5	Pudur	226.68	0	11.72	0	0	0	0	0	41.77	4.33	168.86
14	6	Akkaraipatti	1063.42	0	75.87	20	66	33	0.1	96.06	40	128.57	603.82
15	7	Thalaiyuthu	2996.7	0	216.69	0	0	0	0	0	1321.06	0	1458.95
16	8	Ayyampalayam	627.91	0	6.8	0	0	0	207.14	0	34.82	195.59	183.56
17	9	Manoor	1353.48	0	144.9	5.36	6	18	0	117.32	57	249.48	755.42
18	10	Vilvathampatti	456.7	0	26.03	0.5	25	10	1.57	25.71	21	141.53	205.36
19	11	Puliampatti	945.72	0	46.31	30.81	0	0	0	0	350.86	375.64	142.1
20	12	Kalickkanaickenpatti	364.24	0	74.83	0.72	0	0	0.75	63.8	28.45	38.76	156.93
21	13	Kodaimangalam	961.15	0	146.66	5.82	23.88	30	0.46	166.53	92.55	206.83	288.42
22	14	Pappampatti	416.74	0	0	0	0	0	91.19	57.09	0	111.76	156.7
23	15	Velusamudram	299.19	0	0	28.81	0	0	60.41	0	0	39.65	170.32
24	16	Andipatti	8858.72	0	0	0	0	0	147.13	6012.78	0	1913.09	785.72
25	17	Cinnammapatti	248.67	0	30.7	0	28.28	2.62	0	1.45	0.52	60.57	124.53
26	18	Reddaiyambadi	505.78	0	61.29	0.05	0	0	1.48	24.32	35.11	0	383.53
27	19	R.Vadipatti (South)	154.53	0	0	0	0	0	0	4.71	19.66	46.94	83.22
28	20	Sitharevu	903.7	0	0	0	0	0	183.7	23.6	66.5	182.7	447.2
29	21	Thathanaickenpatti (South)	423.5	244.5	0	61.9	0	0	0	0	36	78.95	2.15
30	22	Iravimangalam	786.47	0	124.22	0.12	4.6	21.8	0	2.83	2.25	57.92	572.73
31	23	Periyammapatti	3187.65	0	314.89	0	0	0	0	428.49	663.3	656.05	1124.92
32	24	Tamaraikulam	461.54	0	92.31	0	0	0	0	0	31.63	0	337.6
Madathukulam Sub-District, Tiruppur District													
33	1	Kuppampalayam	501.9	0	54.25	0	0	0	57.93	0	163.88	27.6	198.24
		total (C)	**30496.33**	**244.5**	**1915.81**	**180.79**	**221.76**	**137.42**	**1024.55**	**7790.06**	**3572.01**	**5147.43**	**10262**
		Grand Total (A+B+C)	**36738.14**	**244.5**	**2708.41**	**641.22**	**375.67**	**199.63**	**1169.17**	**8041.78**	**4018.98**	**6799.23**	**12539.55**

***Source: District Primary Cences Absract, Dindigul District of Tamilnadu State-2011**

Annexure-12

92

From

V.Sasikumar, M.Sc.,
Assistant Director,
Geology and Mining,
Dindigul.

To

Tvl.T&P Aggregates Private Limited,
Chinnakalayamputhur,
Palani Taluk,
Dindigul

Roc.No. 897/2019 (Mines), dated: .08.2021

Sir,

Sub: Mines and Mineral - Minor Mineral - Rough Stone - Dindigul District - over an extent of 3.59.0 hec in SF.No.225/2A of Chinna kalayamputhur Village, Palani Taluk, Dindigul District - Quarry lease application preferred by Tvl.T&P Aggregates Private Limited for grant of quarry lease - existing/proposed/abandoned quarries situated within 500mts radial distance - requested by the lessee - details furnished - regarding.

Ref:
1. Tvl.T&P Aggregates Private Limited, Palani application dated: 05.12.2020
2. The District Collector, Dindigul precise area communication Letter No.897/2019 (Mines) dated: 19.02.2021
3. Letter Tvl.T&P Aggregates Private Limited, Palani dated: 20.02.2021
4. Assistant Director, Geology and Mining, Dindigul mining plan approved letter No. 897/2019 (Mines) dated: .05.2021

.Tvl.T&P Aggregates Private Limited, Palani has applied for grant of quarrying lease for quarrying rough stone over an extent of 3.59.0 hec in SF.No.225/2A of Chinna kalayamputhur Village, Palani Taluk, Dindigul District for a period of 5 years under Rule 19(1) of Tamil Nadu Minor Mineral Concession Rules 1959 in the reference 1st cited.

In the reference 4th cited, the applicant company was directed to produce the mining plan for approval and for obtaining Environmental Clearance from State Level Environmental impact Assessment Authority to grant rough stone quarry lease over an extent of 3.59.0 hec in SF.No.225/2A of Chinna kalayamputhur Village, Palani Taluk, Dindigul District.

In the reference 3rd cited, Tvl.T&P Aggregates Private Limited, Palani has requested to furnish the details of all mines/ quarry located within 500mts radius from the lease area for obtaining Environmental Clearance form State Level Environmental Impact Assessment Authority (SEIAA), Chennai.

In this regard, it is informed that at present the following abandoned/existing/ proposed quarries are located within 500mts radial distance from the periphery of the applied area as detailed below,

Sl. No	Name of the quarry Owner	Name of the Village & Survey Number	Extent (in Hects)	Remarks
a. Existing Quarries				
1.	M.Deivam, S/o.Moockaiya Thevar, No.2-B-83, Chinnakalayamputhur, Palani Taluk,Dindigul	221/3	1.83.0	22.09.2017 to 21.09.2022
2.	S.Athithyan, S/o.Senthil Kathiresan, No.4/87,Pillayar Kovil Street, Pappampatti Post, Sulur, Coimbatore	223/1A2, 223/2A1	2.91.5	20.11.2017 to 19.11.2022
b. Abandoned/Expired Quarries				
1.	Tmt.R.Jayanthi W/o L.Ramesh, 6/1, Nehru Street, Udumalpet Taluk, Tripur District.	227/1	2.08.0	17.12.2015 to 16.12.2020
2.	L.Ramesh, S/o.Lakshumanasamy, 6/1 Nehru Street, Udumelpet 642 126	225/8 227/2 229/1A	4.31.0	12.10.2009 to 11.10.2014
c. Present proposed Quarries				
1.	Tvl.T&P Aggregates Private Limited, Chinnakalayamputhur, Palani Taluk, Dindigul	225/2A	3.59.0	applied area (Rough Stone)

Assistant Director,
Geology and Mining,
Dindigul