
**DRAFT ENVIRONMENTAL IMPACT ASSESSMENT REPORT
&
ENVIRONMENTAL MANAGEMENT PLAN**

NON-CAPTIVE MINE/MAJOR MINERAL/NON-FOREST/VIOLATION CATEGORY

**M/s. RAGAVENDRA MINERALS AND CHEMICALS
THENNILAI LIMESTONE QUARRY**

Mine Lease Area – 2.51.5 hectares

**Peak production Proposed (2019-20) ROM – 1,27,639 Ts
Review of Mining Plan Period – 2023-24 to 2027 -28**

Lease valid up to 2048

**Environmental Clearance under EIA Notification 2006
Schedule Sl. No. 1 (a): Category ‘B’**

Complied as per TOR vide

Letter No. SEIAA- TN/F.No.6121/TOR-323/2018 Dated: 10.05.2018

Extension of ToR obtained vide

Letter No. SEIAA-TN/F.No.6121/TOR-323/Ext/ Dated: 26.09.2022

**As per 440th SEAC & 697th SEIAA (Minutes of Meeting)
(ToR Valid upto 11.01.2025)**

Project Proponent

M/s. RAGAVENDRA MINERALS AND CHEMICALS

Thiru. E. Dhanapal (Managing Partner)

**No. D/364, 1st Cross, Ukkirakaliamman Koil Street,
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Prepared by

GEO EXPLORATION AND MINING SOLUTIONS



Old No. 260-B, New No. 17,

Salem – 636 004, Tamil Nadu, India

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Accredited for sector 1 category ‘A’ & 38 category ‘B’



**Quality Council of India – National Accreditation Board for Education & Training, New Delhi
Certificate No : NABET/EIA/2225/RA0276**



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Baseline Data collected by

KGS Enviro Laboratory Pvt Ltd., Chennai

Baseline Monitoring Period - December 2021 to February 2022.

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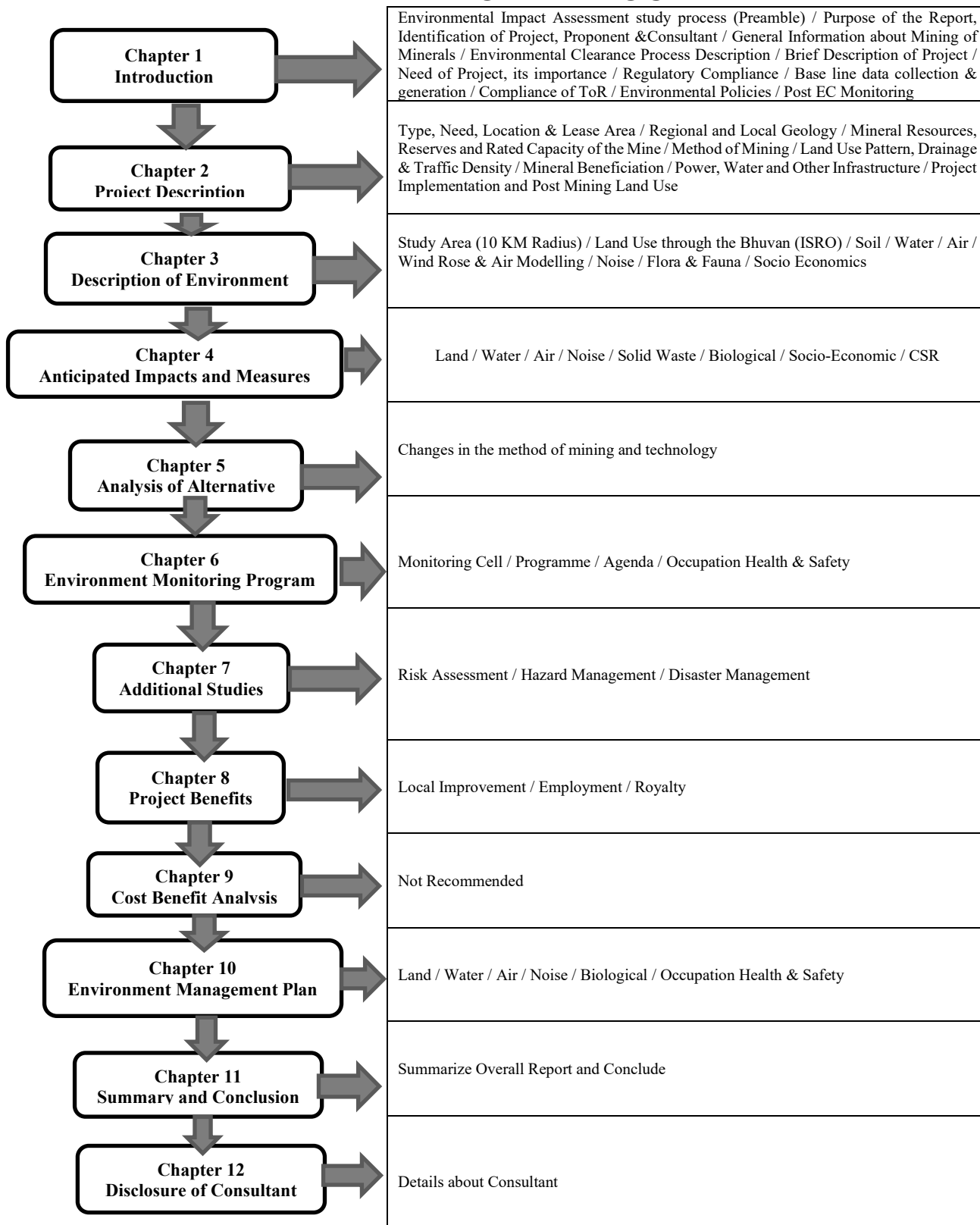
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EIA REPORT LAYOUT



1. INTRODUCTION

1.0 PREAMBLE

Environmental Impact Assessment (EIA) study is a process, used to identify the environmental, social and economic impacts of a project prior to decision-making. It is a decision-making tool, which guides the decisionmakers in taking appropriate decisions for proposed projects. It aims predicting environmental impacts at an early stage of project planning and design, find ways and means to reduce adverse impacts, shape projects to suit the local environment and present the predictions and options to decision makers. By using EIA, both environmental and economic benefits can be achieved. EIA systematically examines both beneficial and adverse consequences of the proposed project and ensure that these impacts are taken into account during the project designing.

The Ministry of Environment & Forests, Government of India, made environmental clearance (EC) for certain development projects mandatory through its notification of 27th January 1994 under the Environment Protection Act, 1986. Keeping in view of the experience gained in environmental clearance process over a period of one decade, the MoEF&CC came out with Environmental Impact Notification, S.O. 1533 (E), Dated: 14th September 2006. The notification has been amended from time to time. It has been made mandatory to obtain environmental clearance for different kinds of development projects (Schedule-1 of notification). But, there was no provision of Environmental Clearance for Major Mineral < 5 ha category.

Initially, the mining lease for limestone was granted to M/s. RAGAVENDRA MINERALS AND CHEMICALS, Karur District vide G.O. 3(D) No. 63, Industries (MMA2) Department Dated: 19.05.1998 for a period of 20 years from 12.11.1998 to 11.11.2018 and the lease deed was executed on 12.11.1998.

As on the date of MoEF & CC Notification S.O. 804 (E) Dated: 14.03.2017, the project had no Environmental Clearance and it was clearly communicated by order to apply for environmental clearance under this notification. Therefore, the project proponent applied for environmental clearance vide online proposal no. IA/TN/MIN/63828/2017 Dated: 09.04.2017

MoEF & CC vide notification S.O. 1030 (E) Dated: 08.03.2018, notified that violation projects of Category B –the appraisal and approval there of shall vest with the State or Union territory level Expert Appraisal Committees and State or Union territory Environment Impact

Assessment Authorities in different States and Union territories, constituted under sub-section (3) of section 3 of the Environment (Protection) Act, 1986.

Therefore, the online proposal to SEIAA – TN vide online proposal number SIA/TN/MIN/23051/2018 Dated 03.04.2018.

ToR was issued vide Lr.No.SEIAA-TN/F.No.6121/TOR-323/2018 Dated: 10.05.2018.

Proponent applied for the extension for the existing ToR vide online proposal No SIA/TN/MIN/268233/2022 Dated 16.04.2022. The proposals were considered in 309th SEAC – TN Meeting held on 02.09.2022 and issued Terms of Reference (ToR) vide Lr.No.SEIAA-TN/F.No.6121/TOR-323/Ext/ Dated: 26.09.2022, The validity of the Terms of Reference is upto **09.05.2023**.

Again, the proposal was placed in 369th SEAC meeting held on 20.04.2023 and SEAC decided to constitute a subcommittee to make an on-site inspection to assess the present Status of the project site and Environmental settings as the proposal falls under violation category and submit the report along with the recommendations to the committee.

Further the committee called for the following additional details:

- To assess ecological damage assessment whether it is being carried out in accordance with CPCB Guidelines, remediation plan, natural resource augmentation and community resource augmentation.

After the receipt of Additional details from the PP and the evaluation report by the subcommittee, SEAC will deliberate on the issue of environmental clearance under violation category. SEAC also decided to request SEIAA-TN to initiate action under sec-19 of the Environment (Protection) act, to be taken for violation cases, in accordance with law and the proposal was placed in 616th SEIAA meeting held on 10.05.2023.

The view of the above, the authority accepts the decision of SEAC and decided to request the member secretary SEIAA to communicate the SEAC minutes to the PP and to write to the state govt\TNPCB to take credible action under the provision of Sec – 19 of the Environment (Protection) act, 1986 against the Project Proponent as per the EIA notification.

The Proposal was placed in 416th SEAC meeting held on 13.10.2023 and as per the 416th SEAC & 670th SEIAA Minutes of Meeting During the meeting, SEAC has decided to direct the PP to conduct the Public hearing for the above proposal.

Therefore, after the long deliberation and discussions in the 416th SEAC meeting, The SEAC has observed that the Public hearing is mandatory for all mining projects of Major Minerals category irrespective of the area for ensuring the scientific and systematic mining and the conservation minerals. The SEAC decided to direct the PP to conduct the Public hearing as per the procedure described in EIA notification 2006 and submit the minutes of the public hearing with action plan for considering the application\proposal towards the grant of EC.

After the receipt of the minutes of the Public Hearing along with updated Final EIA Report submitted by the PP along with a valid Mining Lease. and approved Mining Plan/Scheme of Mining including the PMCP/FMCP for the proposed mining operations, the SEAC may deliberate the future course of action.

Again, the Proposal was placed in 440th SEAC meeting held on 11.01.2024 and as per the 440th SEAC & 697th SEIAA Minutes of Meeting. The proponent requested to extend the validity of ToR to conduct Public Hearing and to update the EIA Report accordingly. since the validity of ToR issued is about to expire on 09.05.2023. The Committee after detailed discussion,

SEIAA may write a letter to TNPCB to consider the above-mentioned cases as a special case and shall be requested to conduct public hearing as per the procedure laid down in EIA Notification, 2006 with the updated baseline data along with EIA report and shall be completed within 1 year from the date of issue of letter.

This proposal was placed in 697th SEIAA meeting and after detailed discussions, the Authority decided to grant extension of ToR for further period of 1 year i.e. up to 11.01.2025 as recommended by SEAC. All the other conditions stipulated in the ToR Lr.No.SEIAA-TN/F.No.6121/TOR-323/Ext/ Dated: 26.09.2022, issued under violation category

Now, as per MMDR Amendment Act 2015, the validity of lease period is extended upto 11.11.2048 and Review of Mining Plan & Progressive Mine Closure Plan was prepared by RQP and approved by Regional Controller of Mines, Indian Bureau of Mines, Chennai vide Lr.No TN/KRR/ROMP/LST-1713.MDS Dated 25.08.2023

As per Gazette Notification S.O. 1886 (E) of 20th April 2022, Mining Projects are classified under two categories i.e. A (> 250 Ha) and B (< 250 Ha), Category-A projects (including expansion and modernization of existing projects) require Environmental Clearance from Central Government (Ministry of Environment, Forests and Climate Change, Government of India, New Delhi) while Category-B projects are considered by State Level Environmental Impact

Assessment Authority (SEIAA), constituted by MoEF&CC, New Delhi. If incase, any Category “B” project attracts the “General Condition” given in the EIA Notification, it shall be treated as Category “A” and will be considered at MoEF&CC, New Delhi.

This EIA report is prepared for M/s. RAGAVENDRA MINERALS AND CHEMICALS Thennilai Limestone Mine– Extent 2.51.5 ha with proposed capacity of 3,06,592 tonnes (ROM-2023-24 to 2027-28) at S.F. No. : 809/2, 3, 4 & 5 (P) in Thennilai Village, Kadavoor Taluk, Karur District and Tamil Nadu State. The project falls under category “B” and requires Environmental Clearance from SEIAA Tamil Nadu.

In order to assess the likely impacts arising out of the project, the Environmental Impact Assessment (EIA) study is undertaken, which will be followed by preparation of a detailed Environmental Management Plan (EMP) to minimize those adverse impacts.

1.1 PURPOSE OF THE REPORT

The sole purpose of this Environmental Impact Assessment report is to assess the beneficial and adverse impacts of the project on the existing environmental systems and to propose appropriate pollution control measures to ensure a secure, hale and healthy environment. Thus the report is a presentation of environmental consequences of the project activity so that all the factors are considered tactfully in eventually claiming a decision. The main objectives are described as follows:

- Evaluation of current level of pollution (air, soil, water & noise) in and around the mine under the existing conditions.
- Assessment of existing Environmental Status of Water, Air, Flora, Fauna, Demography and Land use pattern.
- Suggested measures, recommendations for pollution control, monitoring equipment’s and organizational set up for maintenance of pollution control.

The proposal was issued ToR by SEIAA – TN for preparation of Ecological Damage Plan, Remediation Plan, Natural Resource Augmentation Plan and Community Resource Augmentation Plan as an independent chapter in the Environmental Impact Assessment report by the accredited consultant.

The proponent has engaged **M/s. Geo Exploration & Mining Solutions** an Accredited Organization under Quality Council of India – National Accreditation Board for Education &

Training, New Delhi for preparation of Environmental Impact Assessment and Environmental Management Plan Report for obtaining Environmental Clearance from SEIAA Tamil Nadu.

1.2 IDENTIFICATION OF THE PROJECT AND PROJECT PROPONENT:

1.2.1 IDENTIFICATION OF THE PROJECT

TABLE 1.1: IDENTIFICATION OF THE PROJECT

DESCRIPTION	DETAILS
Name of the mine	Thennilai Limestone Mine
S.F. No's	809/2, 809/3, 809/4, 809/5 (P)
Extent	2.51.5 ha
Classification of Land	Patta Land
Village, Taluk, District and State	Thennilai, Kadavur Taluk, Karur district and Tamil Nadu
Latitude Between	10 ⁰ 45'45.74"N to 10 ⁰ 45'50.55"N
Longitude Between	78 ⁰ 16'45.07"E to 78 ⁰ 16'52.49"E
Proposed Peak Production	1,29,262Ts of ROM (2019-20)

1.2.2 IDENTIFICATION OF THE PROJECT PROPONENT

Name and address of the proponents

Name of the lessee : M/s. Ragavendra Minerals and Chemicals
 Address : D/364, 1st Cross, Ukkira Kaliyamman Koil Street, Amman
 Nagar, Thennur
 District : Trichy
 State : Tamil Nadu
 Pin code : 620 017
 Mobile No : +91 94431-26726
 Email id. : omsakthitile@gmail.com

M/s. Ragavendra Minerals and Chemicals is a Partnership Firm registered under Indian Partnership Act, 1932 and Register of Firms No. 340/91.

List of Partners –

Sl. No.	Name and Address	Designation
1	E. Dhanapal S/o. Errachi Reddiar Old No. D.364, New No. D/11, Ukkira Kaliyamman Koil Street, Annanagar, Tennur, Tirchy – 620 017	Managing Partner & Authorized Signatory
2	Dr. M. Ifthikhar Ahmed S/o. Megabuljon, No. 129/8, 11 th Cross, Sivayanagar, Alagapuram Post, Salem – 14	Partner

Source: Partnership Deed

(Partnership Deed – Enclosed as Annexure V)

1.2.3 PROJECT CONSULTANT:

The proponent has engaged M/s. **Geo Exploration & Mining Solutions** an Accredited Organization under Quality Council of India – National Accreditation Board for Education & Training, New Delhi for preparation of Environmental Impact Assessment and Environmental Management Plan Report for obtaining Environmental Clearance from SEIAA Tamil Nadu.

Name and address of the Consultant:

M/s. Geo Exploration and Mining Solutions

No 17, Advaita Ashram Road,

Alagapuram, Salem – 636 004

Tamil Nadu, India

Email: infogeoexploration@gmail.com

Website: www.gemssalem.com

Phone: 0427 – 2431989

NABET Certificate No: NABET/EIA/2225/RA0276

1.3 GENERAL INFORMATION ON MINING OF MINERALS

Geologically, Tamil Nadu is a treasure trove of various mineral-bearing rocks ranging in age from Pre-Cambrian, Cretaceous, Tertiary and Quaternary Formations. Tamil Nadu is endowed with rich minerals like, lignite, limestone, bauxite, magnesite, fire-clay, quartz, feldspar, gypsum and dimension stones with which the state possesses a prominent place in mineral production in India. Mineral production has been a major factor in providing employment especially in backward areas, earning valuable royalty and foreign exchange. The existence of high-class infrastructure facilities and business environment, further add to the prospect of mineral development and mineral based industries in the state.

This project is about Crystalline Limestone Mining in Thennilai village, Kadavur taluk, Karur District

1.4 ENVIRONMENTAL CLEARANCE

As per the EIA Notification S.O. No. 1533 (E) Dated: 14th September 2006 Mining Projects are classified as Category “A” and Category “B”.

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

1. Screening
2. Scoping,
3. Public consultation &
4. Appraisal

Screening –

As per Gazette Notification S.O. 3977 (E) Dated: 14th August 2018, the project is classified as Category “B”, the extent of mine lease area is 2.51.5ha and the projects doesn't attract any General Condition & Specific Conditions. ***Hence, the proposal for Grant of Environmental Clearance is submitted to SEIAA – Tamil Nadu.***

Scoping –

Based on the documents furnished, SEIAA – TN considered the project under Category “B1” and issued Terms of Reference (ToR) vide SEIAA –TN/F.No.6121/TOR-323/2018 Dated: 10.05.2018.

Public Consultation –

The Public Hearing shall be arranged in a systematic, time bound and transparent manner ensuring widest possible public participation at the project site(s) or in its close proximity District -wise, by Tamil Nadu Pollution Control Board (TNPCB). The procedure for conducting Public Hearing shall be as per Appendix – IV of EIA Notification, 2006.

Appraisal –

Appraisal means the detailed scrutiny by the state expert appraisal committee (SEAC) of the application and other documents like the final EIA & EMP report, outcome of the public consultations including public hearing proceedings, submitted by the proponent to the regulatory authority concerned for grant of environmental clearance. This appraisal shall be made by State Level Expert Appraisal Committee concerned in a transparent manner in a proceeding to which the proponent shall be invited for furnishing necessary clarifications in person or through an authorized representative. On conclusion of this proceeding, the State Level Expert Appraisal Committee concerned shall make categorical recommendations to the regulatory authority concerned either for grant of environmental clearance on stipulated terms and conditions, or rejection of the application for environmental clearance, together with reasons for the same.

This report has been prepared as the standard Terms of Reference framed by SEIAA – TN. The report has been prepared using the following references:

- Guidance Manual of Environmental Impact Assessment for Mining of Minerals, Ministry of Environment and Forests, 2010
- EIA Notification, 14th September, 2006
- ToR prescribed by SEIAA – TN
- Approved Mining Plan and Scheme of Mining
- In addition, other relevant standards for individual activities such as sampling and testing of environmental attributes have been followed.

1.5 BRIEF DESCRIPTION OF THE PROJECT:**1.5.1 PROJECT NATURE, SIZE & LOCATION****TABLE 1.2: DESCRIPTION OF THE PROJECT**

DESCRIPTION	DETAILS
S.F. No's	809/2, 3, 4&5 (P)
Extent& Classification	2.51.5Ha, Patta Land
IBM registration No	IBM/9752/2012, Dated: 16.01.2012
Mine Code	38TMN28029
Village, Taluk, District and State	Thennilai, Kadavur, Karur and Tamil Nadu
Latitude	10 ⁰ 45'45.74"N to 10 ⁰ 45'50.55"N
Longitude	78 ⁰ 16'45.07"E to 78 ⁰ 16'52.49"E
Existing Pit Dimension (In Meters) Length x Width x Depth	155m x 80m x 18m(d)
Nearest Railway Station	Palayam 18Km SW
Nearest Airport	Trichy 46Km E
Nearest State Highway	SH 199 – Karur - Manapparai 6Km West
Nearest National Highway	NH 67 Karur – Trichy – 20Km North
Nearest Sea Port	Tuticorin 222Km South

This limestone mine is a Non-Captive, Non-Forest Land, opencast, category “A” other than fully mechanized; the limestone is proposed to win by deploying hydraulic excavators coupled with tipper. The limestone mineral is being sold to needy cement industries.

1.5.2 SIZE OF THE PROJECT

The total Mine lease area is 2.51.5Ha of Patta Land, Peak production in the mine is 1,29,262Ts of ROM (2019-20). This highest production is due to the transportation of stocked material during the particular period.

The lease period of this mine 12.11.1998 to 11.11.2018 (Twenty years) the proponent had submitted a Renewal Application.

“As per Section – 8 A and Sub-Sections (2) (3) (4) (5) and Sub-Section (6) of MMDR Amendment Act, 2015, the period of lease granted before the date of commencement of MMDR Amendment Act, 2015, where mineral is used for other than captive purpose, shall be extended and be deemed to have been extended up to a period ending on the 31st March, 2020 with effect from the date of expiry of the period of renewal last made or till the completion of renewal period, if any, or a period of fifty years from the date of grant of such lease, whichever is later, subject to the condition that all the terms and conditions of the lease have been complied with.”

On the basis of available reserves the life of the mine is computed and approved as 5 years. Proposed peak production 1,29,262Ts of ROM for the year 2019-20

The proposed Peak production in the year 2019-20	=	1,29,262Ts.
Average Monthly production	=	1,29,262Ts /12 months
	=	10,772Ts
Anticipated Daily production	=	10,772/22 days
	=	490 Ts of ROM
Total no of labours to be engaged in the production side	=	28
OMS	=	$\frac{\text{Daily production}}{\text{No. of workers}} = 490/26 = \mathbf{18 Ts}$

For the peak production the maximum number of tipper (20Ts capacity) trips required **per day would be around 17-18 Ts.**

The Environmental Impact Assessment is calculated based upon the peak production capacity.

TABLE 1.3: RESOURCES AND RESERVES

DESCRIPTION	DETAILS
Geological resources reassessed and approved as per Scheme of Mining and Progressive Mine closure plan IBM 2023	5,63,726Ts
Mineral reserves (111) ROM reassessed and approved as per Scheme of Mining and Progressive Mine closure plan IBM 2023.	3,06,592Ts 47.5% of GR
Limestone 60% Recovery	1,83,955Ts
Total Waste	1,22,636Ts
Year wise production details proposed for five years (2023-24 to 2027-28)	3,06,592Ts
Peak production proposed	1,27,639 (2024-2025)
Peak production per day	425Ts ROM

1.3.4 PAST PRODUCTION DETAILS

The mining operation commenced in the year of 1998.

TABLE 1.4: DETAILS OF YEARWISE PRODUCTION

YEAR	PRODUCTION DETAILS (In Ts)			
	PLANNED		ACTUAL	
	ROM	LIMESTONE	ROM	LIMESTONE
1998-99	-	-	-	-
1999-00	-	3819	-	2750
2000-01	-	3819	-	1950
2001-02	-	3819	-	10
2002-03	-	4774	-	20
2003-04	-	4774	-	10
2004-05	-	4500	-	10
2005-06	-	4500	-	20
2006-07	1950	975	Nil	Nil
2007-08	2184	1092	83	50
2008-09	2418	1209	Nil	Nil
2009-10	2652	1326	855	513
2010-11	3650	1825	Nil	-
2011-12	-	-	667	400
2012-13	-	-	667	400
2013-14	19136	11482	4833	2900
2014-15	23119	13871	12125	7275
2015-16	16536	9922	26675	16005
2016-17	76804	46082	92300	55380
2017-18	75535	45321	-	-
2018-19	50929	30557	-	-
2019-20	129262	77557	-	-
2020-21	42338	25403	-	-
2021-22	39302	23581	-	-
2022-23	44772	26863	-	-
TOTAL	5,30,587	3,47,071	1,38,205	87,693

*2006-07 to 2010-11 proposal 50% recovery achieved 60%

1.6 NEED OF THE PROJECT AND IMPORTANCE TO THE COUNTRY AND REGION

Limestone is one of the important mineral raw materials that finds extensive use in the modern civilization and plays an important role in the development program of the country.

The demand for the limestone is increasing because of its multi furious uses in Industrial projects, irrigation and hydro-power schemes, construction works, etc., Most important uses of limestone is in Metallurgical and chemical industries and the manufacture of cement.

The demand for limestone has been rapidly going up and it has become imperative that more and more limestone suitable for various industrial uses.

It is notable that the Tamil Nadu State is richly endowed with various types of limestone especially south Tamil Nadu, the need of state can be met with from its own resources, it may be in a position to fulfill the demands of other states as well.

In India the production of limestone in 2016-17 at 313.2 million tonnes increased by about 2% as compared to that of the previous year.

Rajasthan was the leading producing state accounting for (21%) of the total production of limestone, followed by Madhya Pradesh & Andhra Pradesh (11% each), Chhattisgarh & Karnataka (10% each), Gujarat, Tamil Nadu and Telangana (8% each).

PRODUCTION OF LIMESTONE IN INDIA, TAMILNADU & KARUR (QTY 000 in Tonnes)

Production of Limestone	2014-15	2015-16	2016-17
India	293273	307001	313196
Tamil Nadu	22227	23008	23840
Karur	-	1926	939

Source: Indian Mineral yearbook 2017 56th Edition (Government of India Ministry of Mines, Indian Bureau of Mines)

In India, limestone mines are worked by opencast method. Captive mines are mechanized and supply feed to cement and iron & steel units. The face length, width and height of the benches correspond to the mining machinery deployed and production schedule. Heavy earthmoving machinery like 3.3 to 4 cu m capacity hydraulic excavators in combination with 10-35 tonnes dumpers is normally used. Other mines are mainly worked by semi-mechanized and manual opencast mining methods. As per MCDR reports drilling are done by Jack hammer & Wagon drill and blasting is done by Slurry explosives, emulsion explosives etc.

Limestone in Tamil Nadu is consumed by various industries like Cement, Steel, Paper, Foundry, Fertilizer, poultry feeds and Chemicals.

The principal use of limestone is in the Cement Industry. Other important uses are as raw material for the manufacture of quicklime (Calcium Oxide), slaked lime (Calcium hydroxide) and mortar. Pulverized limestone is used as a soil conditioner to neutralize acidic soils (agricultural lime).

IMPORTANCE FOR THE REGION (STUDY AREA)

- The entire mined out mineral is been utilized by the Cement and refractory based industries and Manufacturing unit in open market. The grade is been approved and fit for Cement and lime based industries
- The standard of the local villages enhance and employment opportunity has been generated to local community. The project provides direct employment opportunities to about 28 employees and indirectly shall create secondary employment opportunity for local people in mineral transport, service sectors, garages, shops/canteen, etc.,
- There is a great demand for Limestone mineral, to fulfill the demand of market the mined out Limestone will be supplied in the open market
- Government will get seigniorage fees, Royalty, DMF (District Mineral Fund) GST etc.,

1.7 REGULATORY COMPLIANCE

- The Mining Lease for limestone was granted vides G.O. 3(D) No. 63, Industries (MMA2) Department Dated: 19.05.1998.
- The Lease Deed was executed on 12.11.1998 for a period of 20 years and the lease valid upto 11.11.2018.
- The Mining Plan (1998-99 to 2002-03) was approved by Indian Bureau of Mines vide letter No. TN/TCR/MP/LST-564-MDS, Dated: 28.02.1992.
- The First Scheme of Mining (2006-07 to 2010-11) was approved by Indian Bureau of Mines vide letter No. TN/KRR/LST/MS-439/MDS, Dated: 20.04.2007.
- The Second Scheme of Mining (2011-12 to 2015-16) was approved by Indian Bureau of Mines vide letter No. TN/KRR/LST/MS-885.MDS, Dated: 12.08.2013.
- The Third Scheme of Mining (2016-17 to 2018-19 upto 11.11.2018) was approved by Indian Bureau of Mines vide letter No. TN/KRR/LST/MS-1345.MDS, Dated: 01.04.2016.
- The Review of Mining Plan 2018-19 to 2022-23 was approved by Indian Bureau of Mines vide letter No. TN/KRR/LST/ROMP-1497.MDS Dated: 23.05.2018.
- The Review of Mining Plan 2023-24 to 2027-28 was approved by Indian Bureau of Mines vide letter No. TN/KRR/ ROMP/LST-1713.MDS Dated: 25.08.2023.

1.8 SCOPE OF THE STUDY:

The main scope of the EIA study is to identify, quantify the Impacts due to this mining operation and to formulate appropriate mitigation measures with effective environmental management plan. This EIA study initiates the effective ways to mitigate and protect the environment from increasing pollution caused by the mining operation and recommendations for

environmental-friendly development initiatives in the region. The EIA/EMP report has been prepared as per the generic structure specified in the EIA Notification 2006.

1.8.1 DATA GENERATION AND COLLECTION

The base line data have been generated by KGS Enviro Laboratory Pvt Ltd., Chennai, ISO /IEC17025 : 2017 Certified & NABL Accredited Testing Laboratory in accordance with the requirement of statutory agencies to carry out all the regulatory scoping as per the Terms of Reference issued to the project proponent. The EIA study has been carried out for the mine lease area (core zone) and area within 10 Km radius (buffer zone), both of which comprise the ‘*study area*’. The monitoring and testing have been carried out as per the guidelines of MoEF and the IS standards. Monitoring has been conducted for the following parameters:

TABLE 1.5: REGULATORY SCOPING CARRIED OUT FOR EIA AS PER TOR

Sl.No	Description	No of locations	Total No of samples
1	Air Ambient Air Monitoring (24 hourly samples), continuously for 2 days in a week for 4 weeks in a month. Parameters: PM ₁₀ , PM _{2.5} , SO ₂ , NO _x etc., (As per IS 5182 (Part 1-23), National Ambient Air Quality Standards and CPCB)	6 Locations	144 Samples
2	Meteorological parameters at 1 Hourly Continuous Mechanical/Automatic Weather Station Parameters: a. Wind speed, direction b. Relative humidity c. Temperature d. Cloudiness e. Rainfall	-	IS 5182 Part 1-20 Secondary Data from IMD Station.
3	WATER Water/Effluents samples to be collected from each of the various locations (surface and ground water) in core and buffer zone (10 km radius). Analyzed as per IS 10500, IS 3025 And IS 2488 (Part 1-5) Parameters: Water/Effluents: tested for physical, chemical and biological parameters as well Grab sampling once in a Season for Ground Water.	8 Locations	8 Samples
4	Soil Quality Monitoring. Once during study period for Physio-	5 Locations	5 Sample

	Chemical Characteristics. As per IS 2720.		
5	Noise Quality monitoring IS 9989 and as per CPCB Guidelines Hourly observation for 24 hours per location once in the Season At all air quality monitoring station for L_{eq} , L_{day} and L_{night} values.	7 Locations	

The following data's were collected and discussed in this report

- Identification of Eco-Sensitive Places, Wild Life Sanctuaries, Biosphere Reserves within 10 Km Radius through the base map.
- Religious Places / Historical Monuments and Tourist Places within 10 Km Radius.
- Land use pattern within core zone and buffer zone (10 Km Radius around the core zone) based on Bhuvan.
- Population Density, Welfare Amenities and Demography based on last available Census data for entire study area.
- Collecting the Meteorological Data, for past data's from IMD Station and relevant websites.
- Geo-Hydrological aspects based on available data from various secondary sources and correlated by the consultant at the field site.
- Identification of water bodies, hills, roads etc., within 10 Km Radius.
- Details of Fauna and Flora within a distance of 10 Km from the project site and information about Forests, if any.
- Socio Economic studies within 10Km buffer zone by secondary sources like District Census handbook correlating the same by primary survey.

1.8.3 ENVIRONMENTAL SETTINGS WITHIN THE RADIUS OF 10 KM.

- There are No Wild Life Sanctuaries and National Park as per The Indian Wildlife (Protection) Act, 1972, within the Radius of 10 Km.
- The Village (project area) is not cover under HACA Region.
- There is No Western Ghats Region within the Radius of 10 Km.
- There is No Interstate Boundary within the Radius of 10 Km.
- There is No Coastal Regulation Zone (CRZ) within the Radius of 10 Km.
- There are Two Reserve Forest Areas within the Radius of 10 Km; Veeramalai Reserve Forest – 9 Km South East and Vaiyamalaipalayam Reserve Forest – 8 Km South.

- There are two mines located within the radius of 500 Meters from the periphery of this mine lease boundary. Total extent of the mines including this project is about 8.71.0ha (Annexure X – Cluster Certificate).

TABLE 1.6: WATER BODIES WITHIN 10KM RADIUS

SL. NO.	WATER BODIES	DISTANCE AND DIRECTION
1	Punjabattikulam	5.5 Km – North
2	Tharagampatti Kulam	7 Km – South West
3	P.Udayapatti Kulam	3.5 Km – North West
4	Perumaan Kulam	3.5 Km – North West
5	Otta Kulam	8.4 Km – North West

1.8.4 TERMS OF REFERENCE

The Terms of Reference were issued by State Expert Appraisal Committee (SEAC), Tamilnadu and their incorporation in EIA report

TABLE 1.7: TERMS OF REFERENCE WITH COMPLIANCE

Additional Conditions		
1	The project proponent shall submit valid mining lease and scheme of mining plan obtained from the competent authority.	Noted. The Review of Mining plan (2018-19 to 2022-23) was got approved by Indian Bureau of Mines vide Letter No TN/KRR/LST/RoMP/15497.MDS Dated 23.05.2018
2	The project proponent shall submit excess mined out quantity during the violation period after 15.01.2016 along with details of existing pit within the proposed mining area and the copy of remittance of fine levied for the same from the concerned AD, DD, Geology & Mining Dept.	Proponent obtained last permit on 16.12.2016.
3	The project proponent shall submit details of case filed against the project proponent under Section 19 of the Environment (Protection) Act 1986.	No such type of cases filed against this project.
4	The limestone quarry involves raw material extraction, transportation and comminution. Therefore, large quantity of diesel and electricity are supposed to be consumed in the production. The diesel fuel and electricity to be consumed to be furnished	The mining operation will be carried out day time only no Electricity will be used for the mining operation. Diesel consumption for this project would be around 130 – 150 Ltrs per day.
5	What are the green mining technologies to be adopted for reducing GHG/CO ₂ emissions and	Three tier plantation will be carried out around the boundary barrier and BSVI

	lowering the carbon footprint in the limestone mining.	vehicles only allowed to work in the project site.
6	Strategies adopted for safety and healthy mining operations.	Method of mining and strategies for safe mining operation is discussed in the Chapter No 2 Page No. 44
7	What are the transparency and accountability system in place during the operation and post-operation period of the project.	Mining operation will be carried out under the supervision of Mines Manager. CCTV cameras will be installed four corners of the lease area.
8	What are the In-House environmental performance and evolution tools to understand negative impacts of mining.	Environmental Monitoring cell headed by the Mines manager will be formed and the Environmental policy is given in the Chapter No.6.
9	Detailed study to be made on material flow analysis and Life Cycle Assessment (LCA) in the process of production	As per the RoMP the life of the mine is 5 years.
10	Through a chart Illustration, clarify the cradle to grave approach for extraction of limestone and anticipated emissions, environmental threats in every stage and mitigation strategy at every stage.	It is an existing quarry, Exploration studies are already carried out the anticipated impacts and mitigation measures are given in the Chapter No. IV.
11	Project Proponent to study impacts on human health viz respiratory impacts, toxicity impacts and radiation impacts.	Occupational study and health impacts of the project is described in the Chapter No – VI. Page No 133.
12	Study to be made on aquatic, terrestrial toxicity, aquatic eutrophication including detailed terrestrial toxicity and their impacts of wildlife and biodiversity	Impact on the biodiversity is described in the Chapter No IV.
13	What is the total water withdrawal consumption, likely temperature rises and climate change impacts.	No withdrawal of water in this project leads to temperature rises and climate changes.
14	What are the chemical exposures in the limestone mining and risks anticipated to environmental and human health.	The limestone is composed of CaO and MgO. CaO is 45 % to 50% and MgO is 0. to 1.13%. No toxic chemicals in the Limestone hence the risk to the human health is not arise.
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.	The Mining Lease was granted in the year 1998. Details of Year wise production is given in the Table No 1.5, Page No. 7.
2.	A copy of the document in support of the fact that the Proponent is the rightful lessee of the mine should be given.	The Copy of Mining Lease Sanctioned Order and Mining Lease Deed are enclosed as Annexure No. II.

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 mine lease area, production and its management, method of mining etc., in the name of lessee are in compatibility with all documents including approved mine plan, EIA Report.
4.	All corner coordinates of the mine lease area, superimposed on a High Resolution Imagery/ toposheet, topographic sheet, geomorphology and geology of the area should be provided. Such an Imagery of the proposed area should clearly show the land use and other ecological features of the study area (core and buffer zone).	Location Map on the Toposheet covering 10 Km radius (Page No. 28) Location Map of the area covering 2 Km Radius (Page No. 30), Land use land cover map of the study area (Page No. 57) Physiography map (Page No. 61)
5.	Information should be provided in Survey of India Toposheet in 1:50,000 scale indicating geological map of the area, geomorphology of land forms of the area, existing minerals and mining history of the area, important water bodies, streams and rivers and soil characteristics.	Geology Map of the area covering 10 km radius (Page No. 39) Drainage Map of the study area covering 10 km radius (Page No. 60)
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.	Land use cover table 10 Km Radius in Table 3.2, Page No. 57. Geology of the area is discussed in the Chapter 2, Page No. 36-37.
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 Project Proponent will form an Environmental Monitoring Cell. Details in Chapter 6, Page No. 132.
8.	Issues relating to Mine Safety, including subsidence study in case of underground mining and slope study in case of open cast mining, blasting study etc. should be detailed. The proposed safeguard measures in each case should also be provided.	It is an Opencast, category "A" other than fully Mechanized Mining. Details in Chapter 2, Page No. 44
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	The Study Area Details in the Chapter 3, Page No. 56.

	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.	The Study Area Details in the Chapter 3, Page No. 56.
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	No proposal for Dumps outside the Lease Area.
12.	A Certificate from the Competent Authority in the State Forest Department should be provided, confirming the involvement of forest land, if any, in the project area. In the event of any contrary claim by the Project Proponent regarding the status of forests, the site may be inspected by the State Forest Department along with the Regional Office of the Ministry to ascertain the status of forests, based on which, the Certificate in this regard as mentioned above be issued. In all such cases, it would be desirable for representative of the State Forest Department to assist the Expert Appraisal Committees.	The Mining lease area does not involve any Forest Land.
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.	The Mining lease area does not involve any Forest Land.
14.	Implementation status of recognition of forest rights under the Scheduled Tribes and other Traditional Forest Dwellers (Recognition of Forest Rights) Act, 2006 should be indicated.	The project doesn't attract Recognition of Forest Rights Act, 2006.
15.	The vegetation in the RF / PF areas in the study area, with necessary details, should be given.	No RF / PF fall under Study 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.	No National Parks, Sanctuaries, Biosphere Reserves, Wildlife Corridors, Tiger / Elephant Reserves / Critically Polluted Areas within 10 Km Radius of the Mining Lease Area.
17.	Location of National Parks, Sanctuaries, Biosphere Reserves, Wildlife Corridors, Ramsar site Tiger/ Elephant Reserves/(existing as well as	No National Parks, Sanctuaries, Biosphere Reserves, Wildlife Corridors, Tiger / Elephant Reserves /Critically Polluted areas

	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	within 10 Km radius of the Mining Lease Area.
18.	A detailed biological study of the study area [core zone and buffer zone (10 KM radius of the periphery of the mine lease)] shall be carried out. Details of flora and fauna, endangered, endemic and RET Species duly authenticated, separately for core and buffer zone should be furnished based on such primary field survey, clearly indicating the Schedule of the fauna present. In case of any scheduled-I fauna found in the study area, the necessary plan along with budgetary provisions for their conservation should be prepared in consultation with State Forest and Wildlife Department and details furnished. Necessary allocation of funds for implementing the same should be made as part of the project cost.	Details of Biological Study in Chapter 4, Page No. 99-103.
19.	Proximity to Areas declared as 'Critically Polluted' or the Project areas likely to come under the 'Aravalli Range', (attracting court restrictions for mining operations), should also be indicated and where so required, clearance certifications from the prescribed Authorities, such as the SPCB or State Mining Department should be secured and furnished to the effect that the proposed mining activities could be considered.	Project area is not declared in 'Critically Polluted' Area and does not come under 'Aravalli Range'.
20.	Similarly, for coastal Projects, A CRZ map duly authenticated by one of the authorized agencies demarcating LTL, HTL, CRZ area, location of the mine lease w.r.t CRZ, coastal features such as mangroves, if any, should be furnished. (Note: The Mining Projects falling under CRZ would also need to obtain approval of the concerned Coastal Zone Management Authority).	The project doesn't attract The C. R. Z. Notification, 1991.
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 programs prepared and submitted accordingly, integrating the sectoral	It's an Existing Mine – No reclamation and rehabilitation Proposed.

	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.	Baseline Data were collected for One Season (non-monsoon) December 2021 – February 2022. Details in Chapter 3, Page No. 55 - 103
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 has been done by using AERMOD view 9.1 Model. Details in Chapter 3, Page No. 87 – 92.
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.	Total Water Requirement: 1 KLD Chapter 2, Page No. 49
25.	Necessary clearance from the Competent Authority for drawl of requisite quantity of water for the Project should be provided.	Water for dust suppression, greenbelt development and domestic use will be obtained from accumulated rainwater/seepage water in mine pits. Drinking water will be sourced from the approved water vendors, Page No. 49.

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 collected in the pits after spell of rain will be used for greenbelt development and dust suppression. At the end of life of mine, excavated area will be used as a water reservoir Page No. 121.
27.	Impact of the Project on the water quality, both surface and groundwater, should be assessed and necessary safeguard measures, if any required, should be provided.	Impact Studies and Mitigation Measures of Water Quality in Chapter 4, Page No. 121.
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.	The ground water table is at 40-37m below ground level. The ultimate depth of mine working is 33m from the general ground profile the project shall not intersect the ground water table, Page No. 117.
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.	There is no stream, seasonal or otherwise passing through the lease area.
30.	Information on site elevation, working depth, groundwater table etc. Should be provided both in AMSL and bgl. A schematic diagram may also be provided for the same.	Elevation of the lease area is 174m AMSL. Ultimate depth of the mine is 141m AMSL. Water level of the area is 40-37m below ground level. Ultimate Depth of the mine is 33m below ground level.
31.	A time bound Progressive Greenbelt Development Plan shall be prepared in a tabular form (indicating the linear and quantitative coverage, plant species and time frame) and submitted, keeping in mind, the same will have to be executed up front on commencement of the Project. Phase-wise plan of plantation and compensatory afforestation should be charted clearly indicating the area to be covered under plantation and the species to be planted. The details of plantation already done should be given. The plant species selected for green belt should have greater ecological value and should be of good utility value to the local population with emphasis on local and native species and the species which are tolerant to pollution.	Recommended Species proposed for Greenbelt Development are given in the Chapter 10, Page No. 153.

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.	Transportation will not have significant impact on the existing traffic density/ existing road. Details in Chapter 2, Page No.48.
33.	Details of the onsite shelter and facilities to be provided to the mine workers should be included in the EIA Report.	Adequate infrastructure & other facilities are provided to the Mine Workers Page No. 50.
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.	Conceptual Plan – Page No. 131 Post Mining Land Use – Table 4.1, Page No. 113 Reclamation and Restoration Plan – Page No.47
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.	Details in Chapter 6, Page No. 133.
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 in Chapter 3, Page No. 108-109.
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.	Details in Chapter 3, Page No. 102
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.	Environment Management Plan Chapter 10, Page No. 147
39.	Public Hearing points raised and commitment of the Project Proponent on the same along with time bound Action Plan with budgetary provisions to implement the same should be provided and also	The Public Hearing shall be arranged in a systematic, time bound and transparent manner ensuring widest possible public participation at the project site(s), by Tamil

	incorporated in the final EIA/EMP Report of the Project.	Nadu Pollution Control Board (TNPCB). The procedure for conducting Public Hearing shall be as per Appendix – IV of EIA Notification, 2006.
40.	Details of litigation pending against the project, if any, with direction /order passed by any Court of Law against the Project should be given.	No litigation is pending in any court against this project.
41.	The cost of the Project (capital cost and recurring cost) as well as the cost towards implementation of EMP should be clearly spelt out.	The capital cost of the project is Rs. 21,31,500/- Details in Chapter 2, Page No. 50.
42.	A Disaster management Plan shall be prepared and included in the EIA/EMP Report.	Details in Chapter 7, Page No. 137.
43.	Benefits of the Project if the Project is implemented should be spelt out. The benefits of the Project shall clearly indicate environmental, social, economic, employment potential, etc.	Details in Chapter 8, Page No. 143.
44.	Besides the above, the below mentioned general points are also to be followed:-	
a	Executive Summary of the EIA/EMP Report	Page No. 1 – 10
b	All documents to be properly referenced with index and continuous page numbering.	All the documents are properly referenced with index and continuous page numbering.
c	Where data are presented in the Report especially in Tables, the period in which the data were collected and the sources should be indicated.	List of Tables and source of the data collected are given properly.
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	Baseline monitoring reports are enclosed as Annexure –V
e	Where the documents provided are in a language other than English, an English translation should be provided.	Not Applicable.
f	The Questionnaire for environmental appraisal of mining projects as devised earlier by the Ministry shall also be filled and submitted.	Will be submitted after carrying out the public hearing.
g	While preparing the EIA report, the instructions for the Proponents and instructions for the Consultants issued by MoEF&CC vide O.M. No. J-11013/41/2006-IA.II(I) Dated: 4th August, 2009, which are available on the website of this Ministry, should be followed.	Instructions issued by MoEF & CC O.M. No. J-11013/41/2006-IA.II (I) Dated: 4th August, 2009 are 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	No Modifications done.

	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.	Not applicable.
j	The EIA report should also include (i) surface plan of the area indicating contours of main topographic features, drainage and mining area, (ii) geological maps and sections and (iii) sections of the mine pit and external dumps, if any, clearly showing the land features of the adjoining area.	Surface Plan – Page No.35 Geological Plan – Page No.37 Working Plan – Page No.42-43

1.9 POST ENVIRONMENT CLEARANCE MONITROING

The proponents shall submit the compliance report in respect of Granted Environmental Clearance every 1stJune and 1stDecember of each calendar year to

1. MoEF & CC – Half yearly compliance report
2. TNPCB - Half yearly compliance report
3. IBM quarterly, half yearly and annual reports

Besides the Mines manager or mine agent will submit the periodical compliance reports to

1. Director of mines safety,
2. Labor enforcement officer,
3. Controller of explosives as per the norms stipulated by the department.

1.10 TRANSFERABILITY OF ENVIRONMENTAL CLEARANCE

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

1.11 GENERIC STRUCTURE OF EIA DOCUMENT

The overall contents of the EIA report follow the list of contents prescribed in the EIA Notification 2006 and the “Environmental Impact Assessment Guidance Manual for Mining of Minerals” published by MoEF & CC. The report consists of twelve chapters and the content is briefly described in this section.

Chapter 1 – Introduction:

This chapter contains the general information on the location of the mines, mining methods, and major sources of environmental impacts in respect of mining projects and details of environmental clearance process.

Chapter 2 – Project Description:

In this chapter the type of the project, need for the project, project location, layout, project activities during preparation and operation phases, capacity of the project, project operation i.e., land availability, utilities (power and water supply) and infrastructure facilities such as roads, railways, housing and other requirements are provided. The project implementation schedule, estimated cost of development as well as operation etc. is also included.

Chapter 3 – Description of the Environment:

The methodology for assessing various baseline environmental components in the study area prior to the commencement of the project has been identified in this chapter. The various parameters of present environmental status are identified under different aspects, which include location and regional setting of the area, physical aspects such as land use, land cover and soil quality. Hydrological aspect consists of area drainage, surface and ground water quality.

Meteorological aspect contains all the climatic factors and ambient air quality of the study area. Ecological environment describes the flora and fauna of the region. Human aspect includes the demographical features, socio-economic environment and infrastructure facilities of the study area.

Chapter 4 – Anticipated Environmental Impacts & Mitigation Measures:

This chapter describes the anticipated impacts on the environment and the mitigation measures. The method of assessment of impacts including studies carried out, modelling techniques adopted to assess the impacts where pertinent should be elaborated in this chapter. The Environmental Impact Assessment of the project during construction and operation stages is provided. The mathematical modelling exercises pertaining to ground level concentrations of air pollutants have been presented in this chapter with suitable mitigation measures.

Chapter 5 – Analysis of Alternatives:

This chapter gives details of various alternatives both in respect of location of site and technologies to be deployed.

Chapter 6 – Environment Monitoring Programme:

This chapter emphasizes the formation of an Environment Management Cell with trained staff under Senior Environment Engineer equipped with all monitoring facilities for monitoring of all environmental parameters during construction as well as post project monitoring. Organization structure for environmental management and frequency of monitoring has also been provided.

Chapter 7 – Additional Studies:

This chapter covers the details of the additional studies required as per ToR prescribed by MoEF & CC like Risk Assessment, Public Consultation details and Social Impact Assessment and R&R plans.

Chapter 8 – Project Benefits:

The benefits that will be accrued from the project in the locality in particular and society in general as well as development will be identified and described in this chapter.

Chapter 9 – Environmental Cost Benefit Analysis:

Environmental Cost Benefit analysis is not recommended.

Chapter 10 – Environmental Management Plan:

In this chapter, an environmental strategy to mitigate the adverse effects likely to occur on environmental parameters during mining phase has been drawn up for the proposed mining project. Post project monitoring and organization structure for environmental management has been given in this chapter.

Chapter 11 – Summary & Conclusion:

This chapter gives a brief of the focus areas of the report for a quick glance.

Chapter 12 – Disclosure of the Consultant:

The detailed profile of the consultants along with their capabilities, professional expertise and work experiences are highlighted in this chapter.

2. PROJECT DESCRIPTION

2.0 GENERAL:

The Thennilai limestone mine lease area is 2.51.5Ha which is > 5ha; It is a Non- Captive Mine, Open cast category “A” other than fully mechanized mine, catering to cement and lime based industries.

The project proponent is a company (Partnership firm). Mr. E. Dhanapal is the Managing Partner of the Company and Mr. M.Ifthikhar Ahmed is another partner. No other mining leases or quarrying leases has been granted to this company, The Company has full-fledged mining team and it is well versed in limestone mining for more than two decades.

The mining lease was granted in the year of 1998 and it got expired in the year 2018. As per MMDR Amendment Act 2015, the validity of lease period shall be deemed to have been granted for a period of fifty years. Hence the total lease period of mining lease is 50 years from the date of execution of mining lease from 12.11.1998 to 11.11.2048.

The ore deposit is crystalline metamorphic limestone (hard rock) runs linear on the North east South west direction with almost vertical dipping, average width of 68m.

Thennilai is located in the district of Karur, Tamilnadu which has a good connectivity to State Highway, National Highway, Railway Station, Airport and Seaport.

The Resource and Reserves of limestone has been assessed afresh by United Nation Framework Classification (UNFC) and the same has been submitted and got approval from Indian Bureau of Mines.

TYPE OF THE PROJECT:

- The limestone mine is an existing mines, non captive, Open cast Category “A” other than fully mechanized. There are no technological changes in the mining operations. The raw limestone produce in the mine is transported to the needy cement industries based on their requirement.
- Limestone mineral is produced by deploying heavy earth moving machineries like excavators coupled with tippers. shot hole drilling with controlled blasting using slurry explosives for give heaving effect in the ore deposit.
- The project is site specific, there is no additional area required for this project.
- No effluent generation/discharge from the mine.
- It is an existing project hence no trees are uprooted.

NEED FOR THE PROJECT

The entire mined out mineral has been transported to the needy cement industries around 30-50KM radius for the blending purpose. Based upon the market demand for cement, the limestone mine is economically viable at present market conditions.

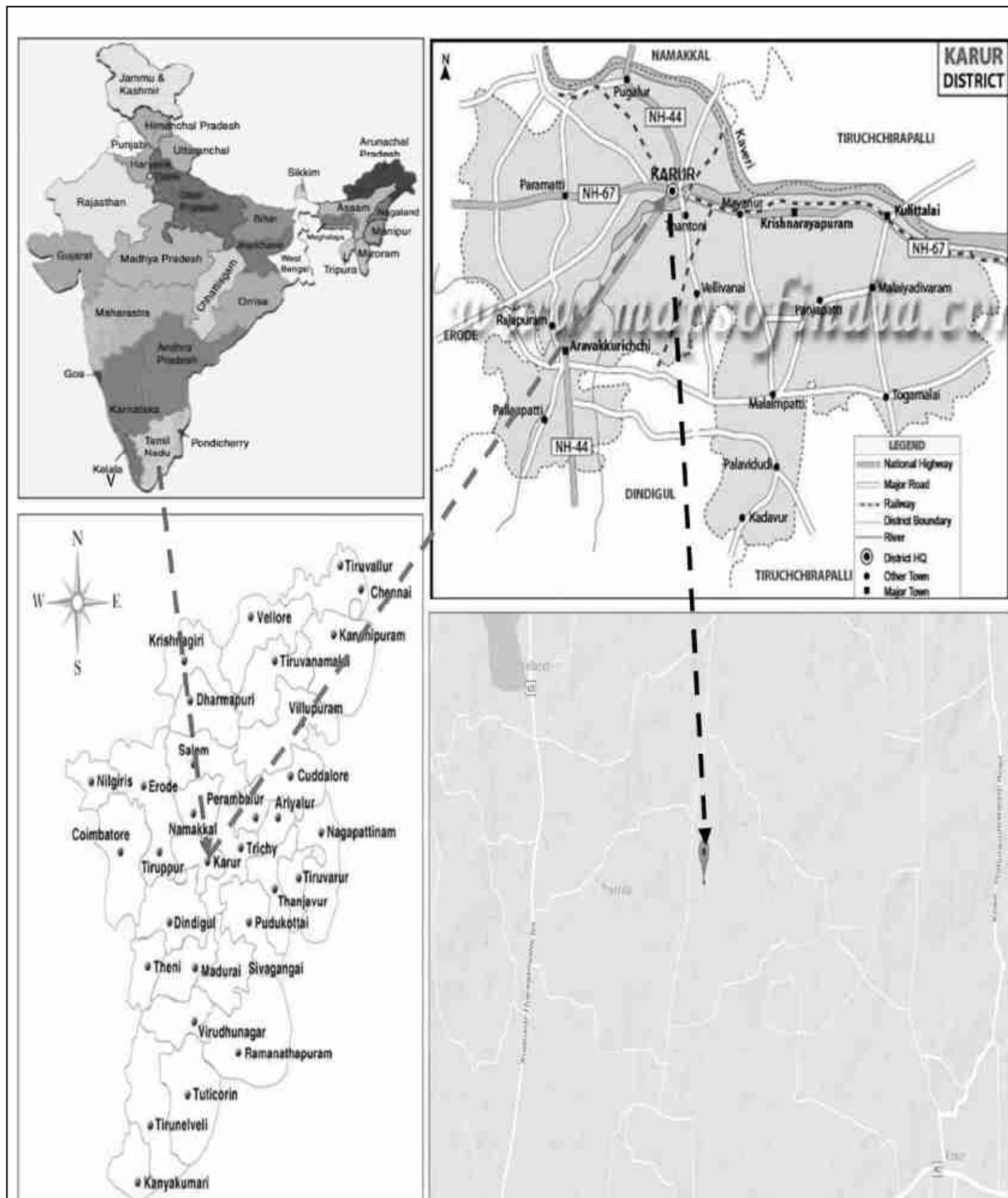
The Project aims to augment supply of limestone to needy customers to maintain the demand and supply gap. Through this project about 28 members of local community peoples are being benefitted directly and around 50 peoples are getting benefit indirectly through this project.

The Government will get benefitted through GST, Royalty sum of Rs 80/-, TDS 2%, NMET 2%, DMF 30%, totally Rs.107.2 Per ton. Based on the production capacity the total Royalty would be around Rs. 1,97,20,619/- for the entire mineable reserves.

2.1 LOCATION OF THE PROJECT

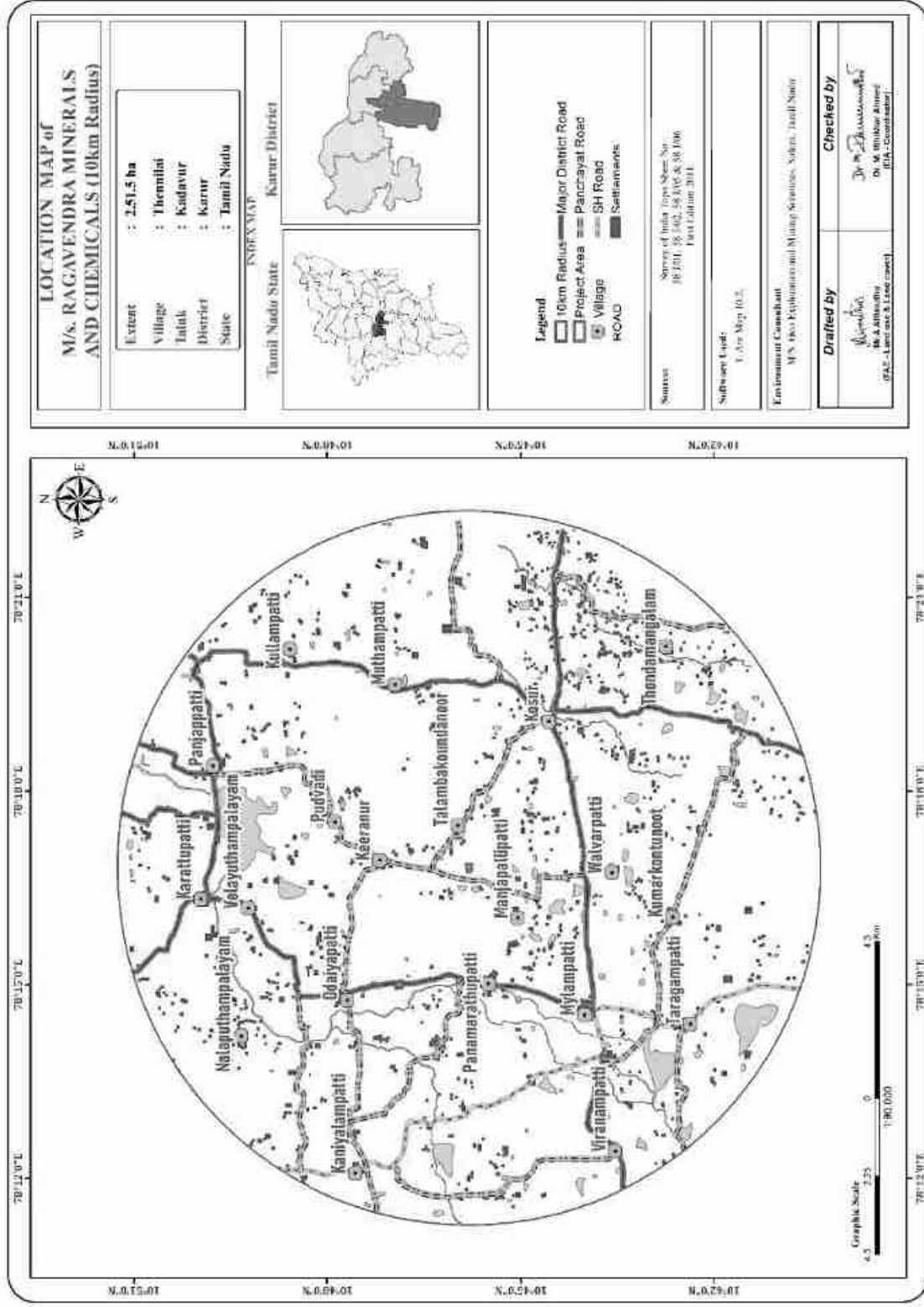
- The Mining Lease area is located in Thennilai village, Kadavur Taluk & Karur District, Tamil Nadu State.
- The project falls in Toposheet No: 58-J/05
- Latitude 10⁰45'45.74"N to 10⁰45'50.55"N
- Longitude 78⁰16'45.07"E to 78⁰16'52.49" E
- The Mine lease area is patta land (Non forest land) does not fall in any eco – sensitive zone of Wild life, National Park, Tiger Reserve, Elephant Corridor and Biosphere.
- Nearest National Highway is (NH 67) Karur – Trichy – 20.0Km North.
- Nearest State Highway is (SH 199) Puliur – Uppidamangalam 6Km South West side
- Nearest Sea port Tuticorin 217Km South side

FIGURE 2.1: LOCATION MAP OF THE PROJECT AREA WITH CO ORDINATES



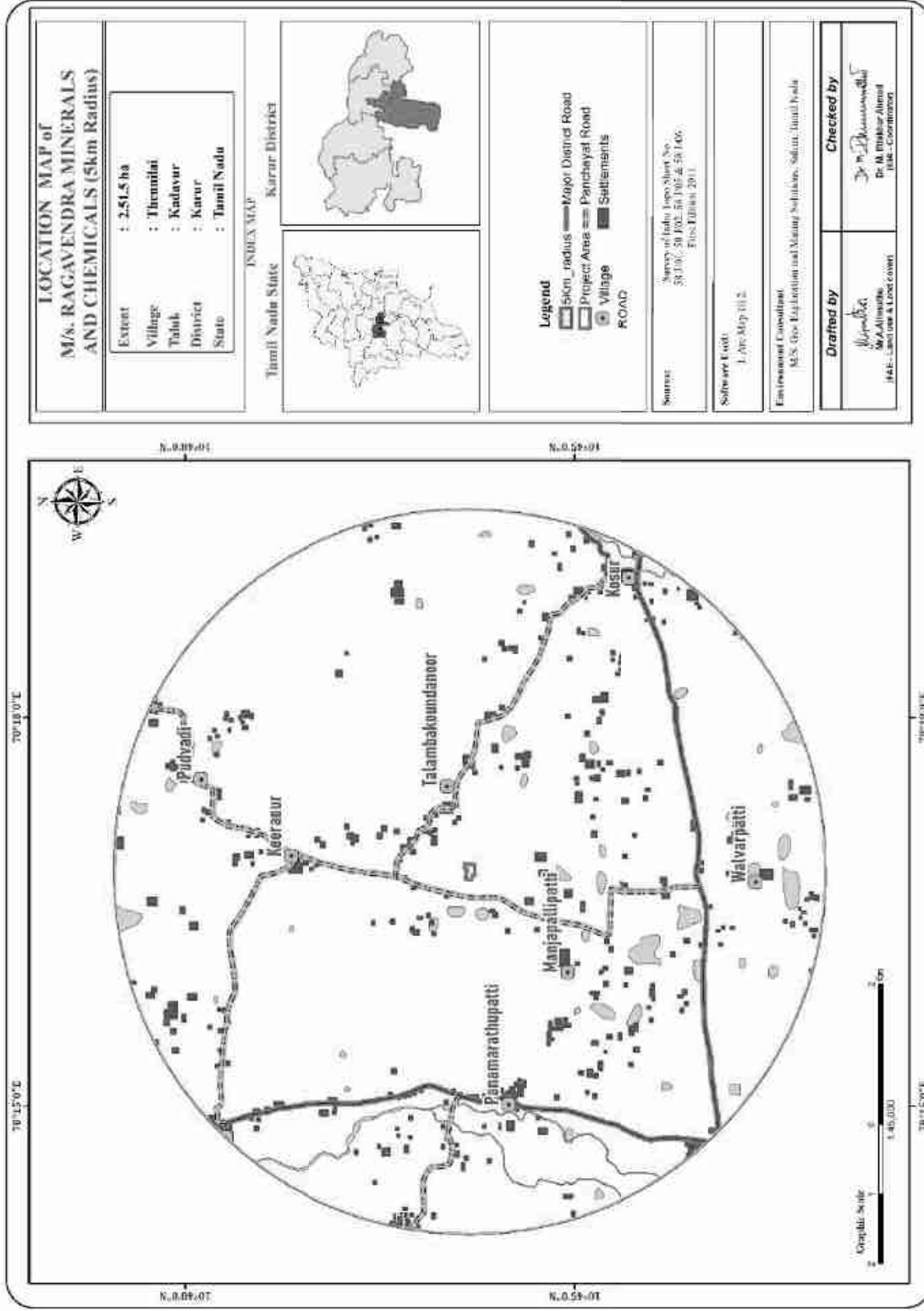
Source: Google maps

FIGURE 2.2 LOCATION MAP ON THE GEO REFERENCED TOPOSHEET (10KM RADIUS)



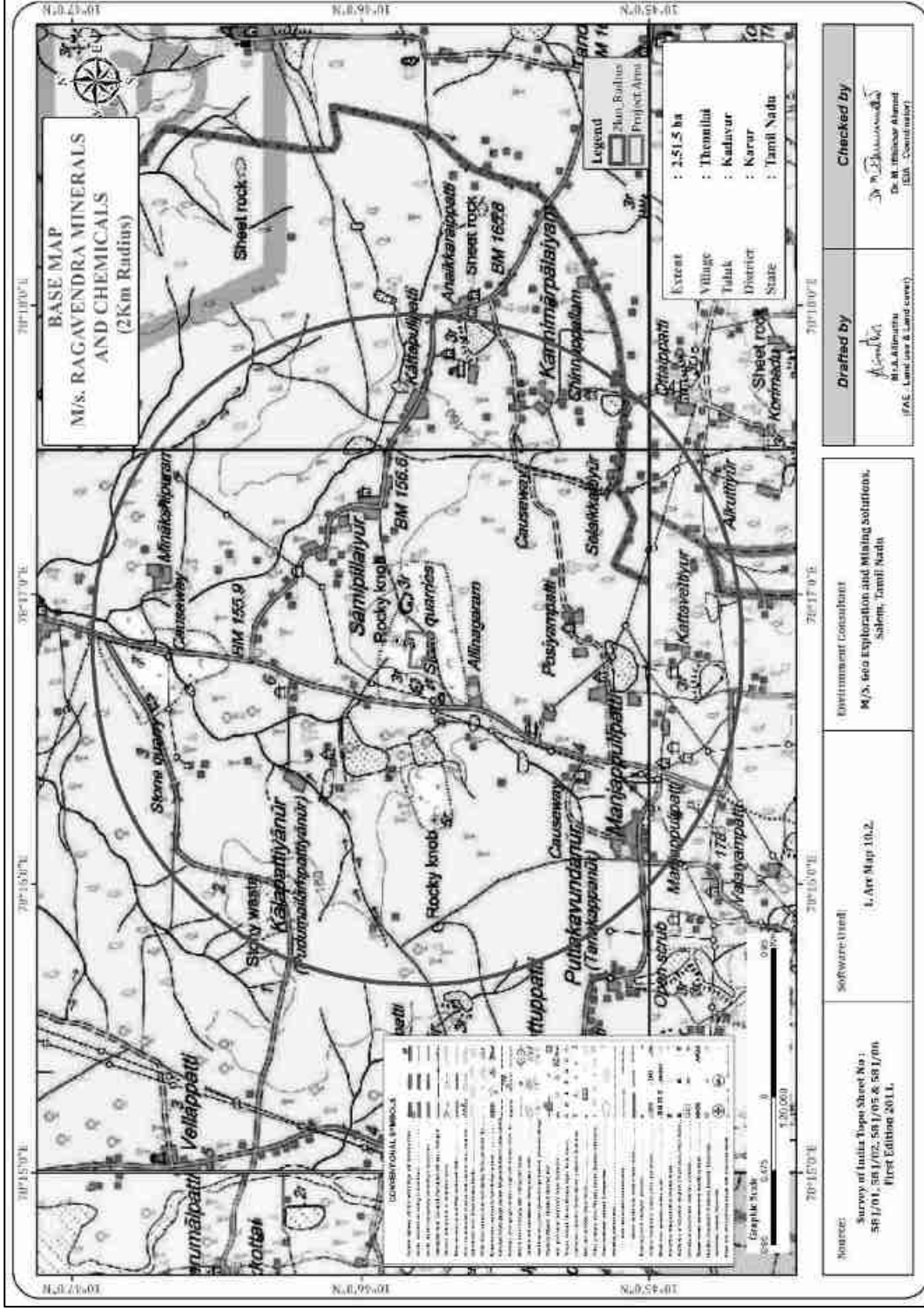
Source: Digitized in Geographical information system (ARC GIS), Survey of India 11th Edition, 2011

FIGURE 2.3: DIGITIZED LOCATION MAP COVERING 5KM RADIUS



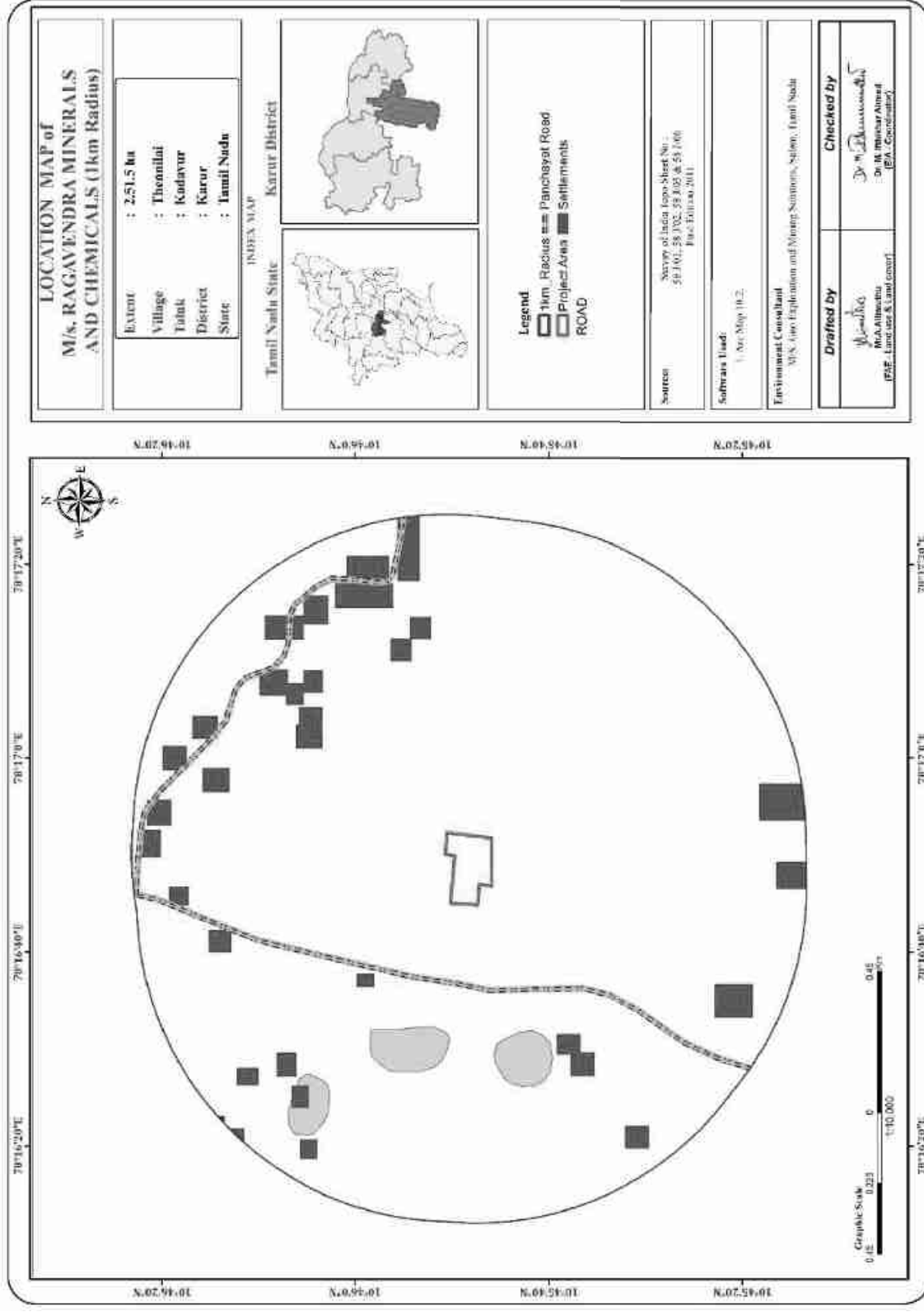
Source: Digitized in Geographical information system (ARC GIS), Survey of India 11th Edition, 2011

FIGURE 2.4: LOCATION MAP ON THE GEO REFERENCED TOPOSHEET SHOWING LOCATION (2KM RADIUS)



SOURCE: Geological Survey of India Toposheet, 11th Edition 2011.

FIGURE 2.5: LOCATION MAP COVERING 1KM RADIUS



Source: Topo sheet Map digitized in Geographical Informatics system (GIS)

2.2 LEASE HOLD AREA

- The lease area is an existing limestone mines which is site specific, Non-captive use, opencast category “A” other than fully mechanized.
- No beneficiation or mineral processing is proposed.
- Two quarries located within the radius of 500m from the periphery of the mine lease boundary, total extent of the mines is about 8.71.0ha including this proposal.
- Contour level of the area is 174. The general Gradient of the area is South East side.

TABLE 2.1: LOCATION DETAILS.

DESCRIPTION	FEATURES
Latitude	10 ^o 45'45.74"N to 10 ^o 45'50.55"N
Longitude	78 ^o 16'45.07"E to 78 ^o 16'52.49"E
MSL	174
S.F.No's	809/2, 3, 4 & 5 (P)
Extent	2.51.5Ha
Village, Taluk, District & State	Thennilai, Kadavur, Karur and Tamilnadu.

Table 2.2: EXTERNAL INFRASTRUCTURES

Sl.No	Particulars	Location	Direction	Approximate distances in KM
1.	Nearest Post Offices	Thennilai	W	2
2.	Nearest Town (DH)	Karur	NW	30
3.	Nearest Polices station	Chintamanipatti	W	12
4.	Nearest Govt.Hospital	Mailampatti	SW	6
5.	Nearest School	Mailampatti	SW	6
6.	Nearest DSP offices	Kulithalai	NE	25
7.	Nearest Railway station	Palayam	SW	18
8.	Nearest Seaport	Tuticorin	S	222
9.	Nearest Airport	Trichy	E	46

There are no significant features within the radius of 500m, it is a dry land. Some people will perform sustenance farming due to the availability of small land during rainy seasons.

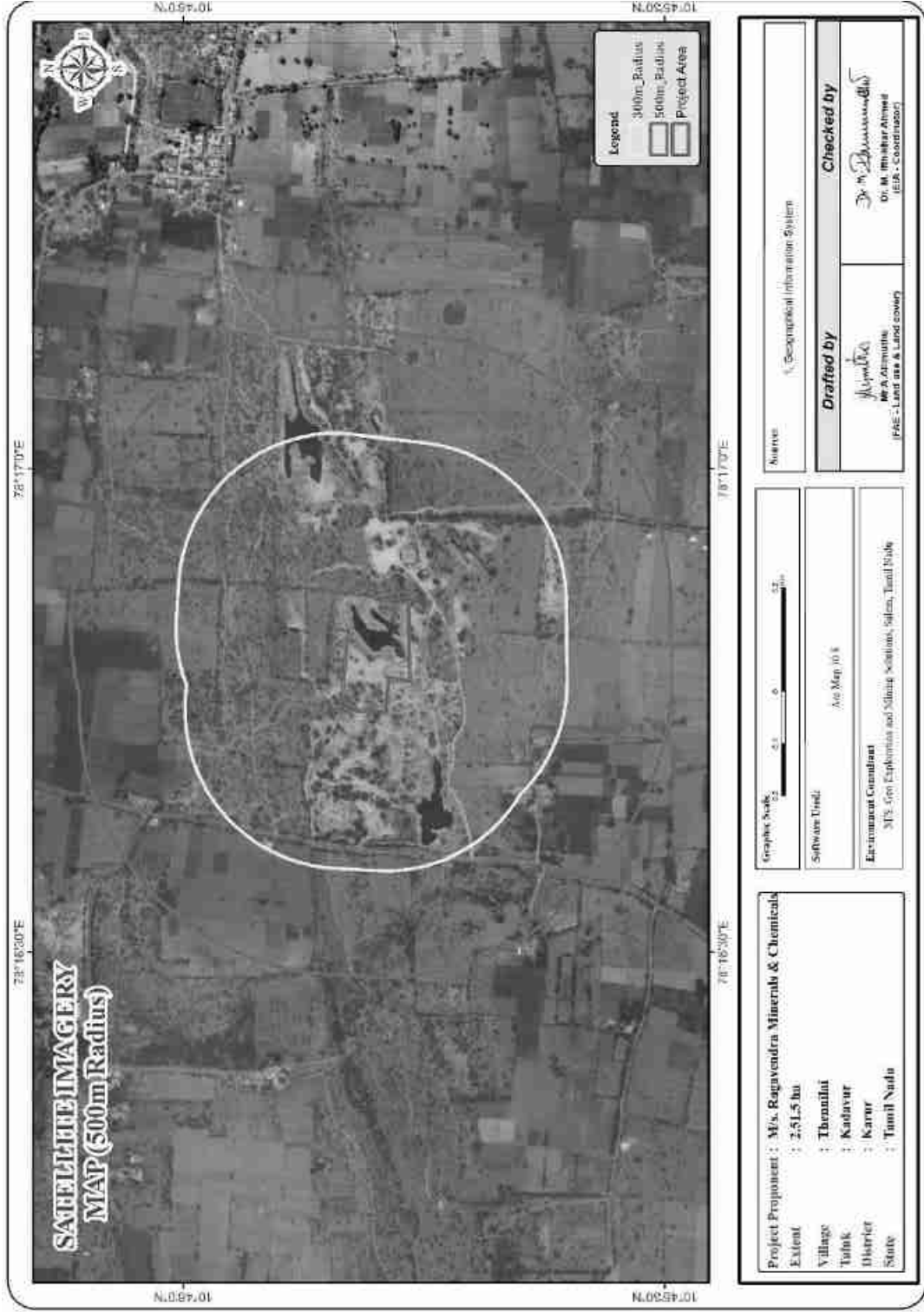
TABLE 2.3: MINES WITHIN THE RADIUS OF 500m.

S.No	Name of the lessee	S.F.No	Extent in ha	Validity of the lease period
1	Thiru. E.Dhanapal	806/5, 6 and 807/3	3.15.0	17.06.1995 to 16.06.2015 Deemed Extension
2	Tvl. Ragavendra Minerals & Chemicals	809/2, 809/3, 809/4, 809/5 (P)	2.51.5	12.11.1998 to 11.11.2018
3	Thiru.Panneerselvam	815/1, 815/2, 815/3, 815/4A, 815/4B & 815/5	3.04.5	31.10.1995 to 30.10.2015
Total			8.71.0	

FIGURE 2.6: TOPOGRAPHICAL VIEW OF LEASE AREA

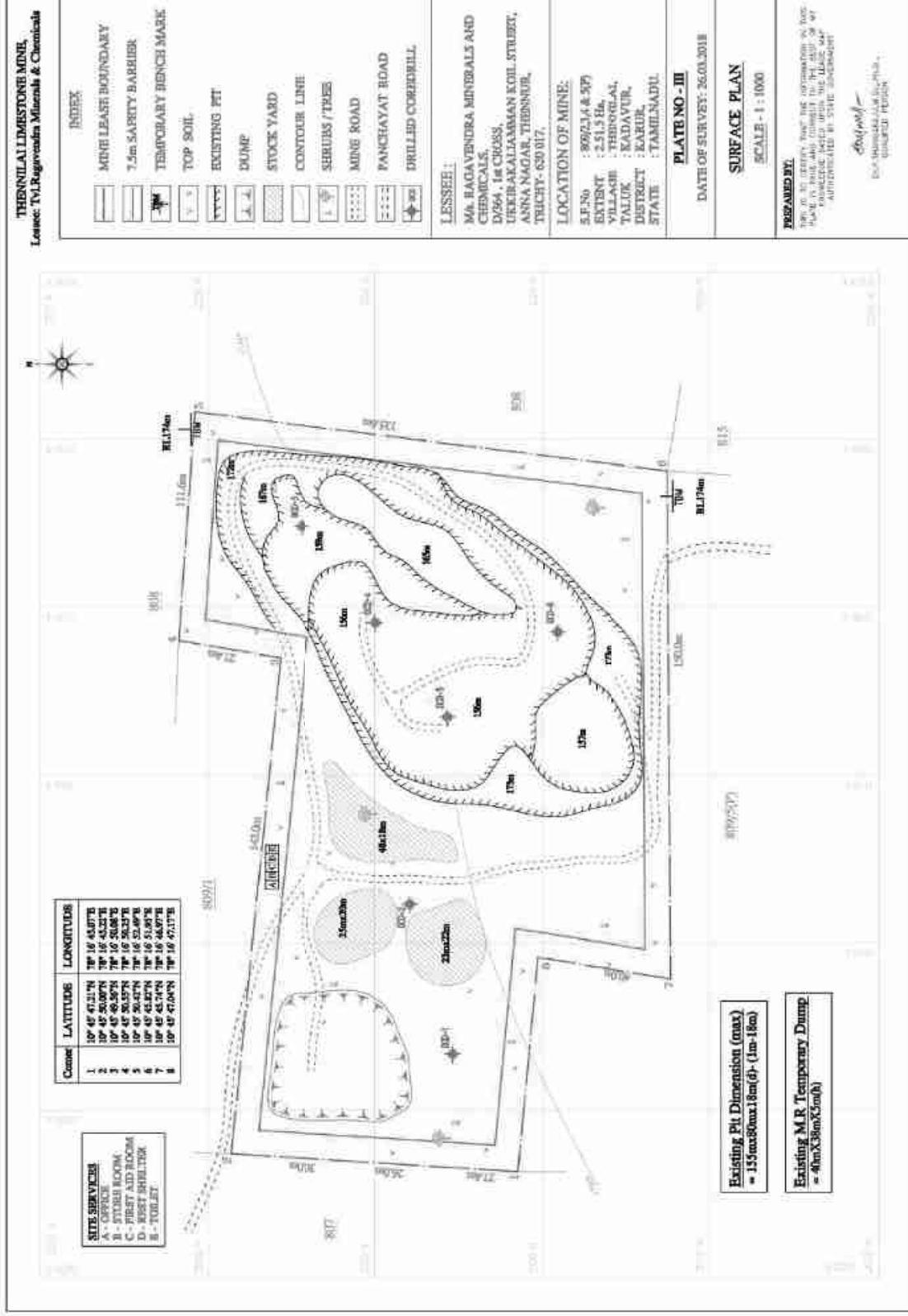


FIGURE 2.7: MINE LEASE AREA COVERING 300M AND 500M



Source : Google Earth imagery

FIGURE 2.8: SURFACE PLAN OF THE AREA



Source : Approved Scheme of mining (IBM) 2018-19 to 2022-23

2.3 REGIONAL GEOLOGY:-

The area comprises crystalline Archaean rocks of deep seated metamorphic origin which include mainly calc-gneiss, cordierite-sillimanite Gneiss, Biotite gneiss and granite gneiss. The gneisses appear to have resulted by migmatizations of the preexisting sediments by intrusive of high grade metamorphism viz. High temperatures and pressures. In addition, younger intrusive such as granites, pegmatites and quartz veins are found within the limestone. The above said different types of metamorphosed rocks occur in the form of long, narrow, parallel bands which are traceable over a long distance. Limestone, band is noticed with prominent outcrops.

The regional trend of the rock in the area is NE – SW with Dipping S60⁰E.

The general geological sequence of the limestone deposits is as follows:

Order of Super position:

AGE		ROCKFORMATION
Recent	-	Reddish Soil
Achaean	-	Crystalline Limestone
	-	Calc-gneiss.

2.3.1 LOCAL GEOLOGY

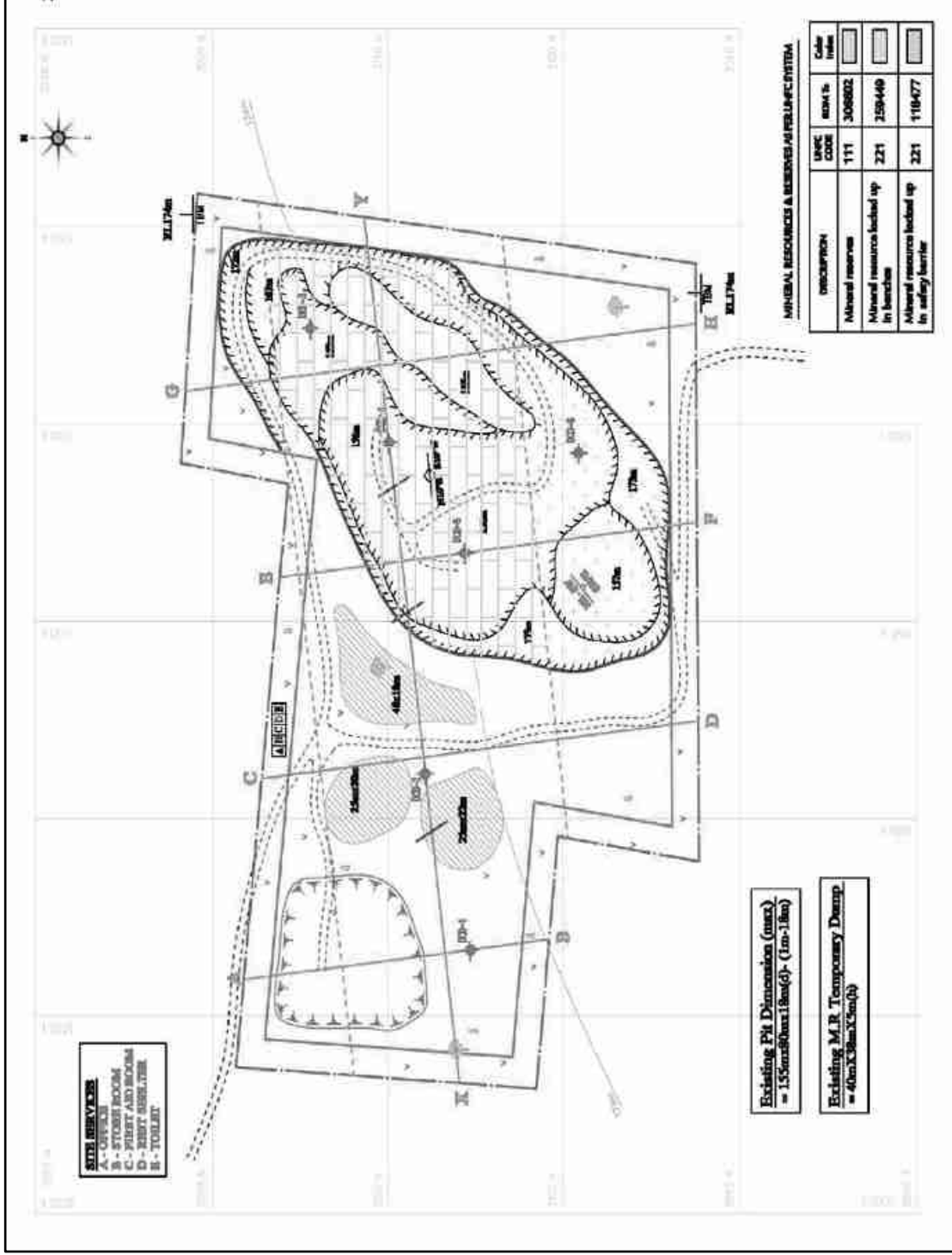
The area was surveyed in detail to prepare a Geological map in the scale of 1:1000 showing the various formations and attitude of the deposit. It is inferred that the Limestone mineral is of cement grade and in form Band running N10⁰E – S10⁰W with Vertical dipping. Reddish soil covers upto a depth in about 1m. Recovery of minerals is estimated as 60% of the total excavation of the ore body. The recovery percentage is based on the knowledge gained from the present mine workings and adjacent working mine in this region, by the field tests carried out in the lease area and analysis done in NABL Laboratories.

The physical attitude of the limestone band is demarked as follows:

Strike length (m)	:	220
Width (m)	:	68
Depth (m) Proved	:	33 with an average of 1m topsoil
Strike direction	:	N10 ⁰ E – S10 ⁰ W
Dip amount and direction	:	Vertical

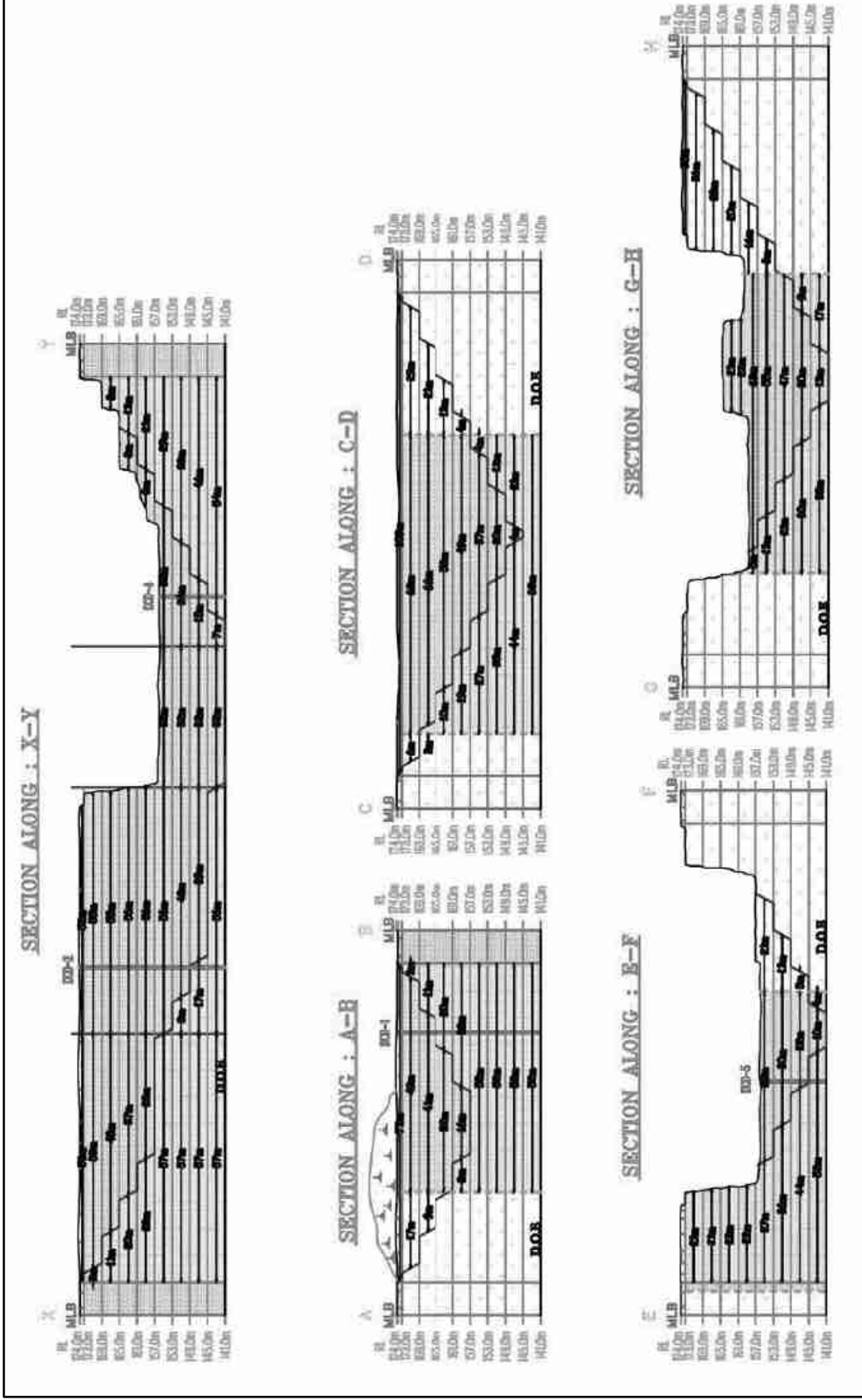
The deposit is covered by 1m thickness of topsoil followed by 32m thickness of Limestone band.

FIGURE 2.9: GEOLOGICAL PLAN OF THE AREA



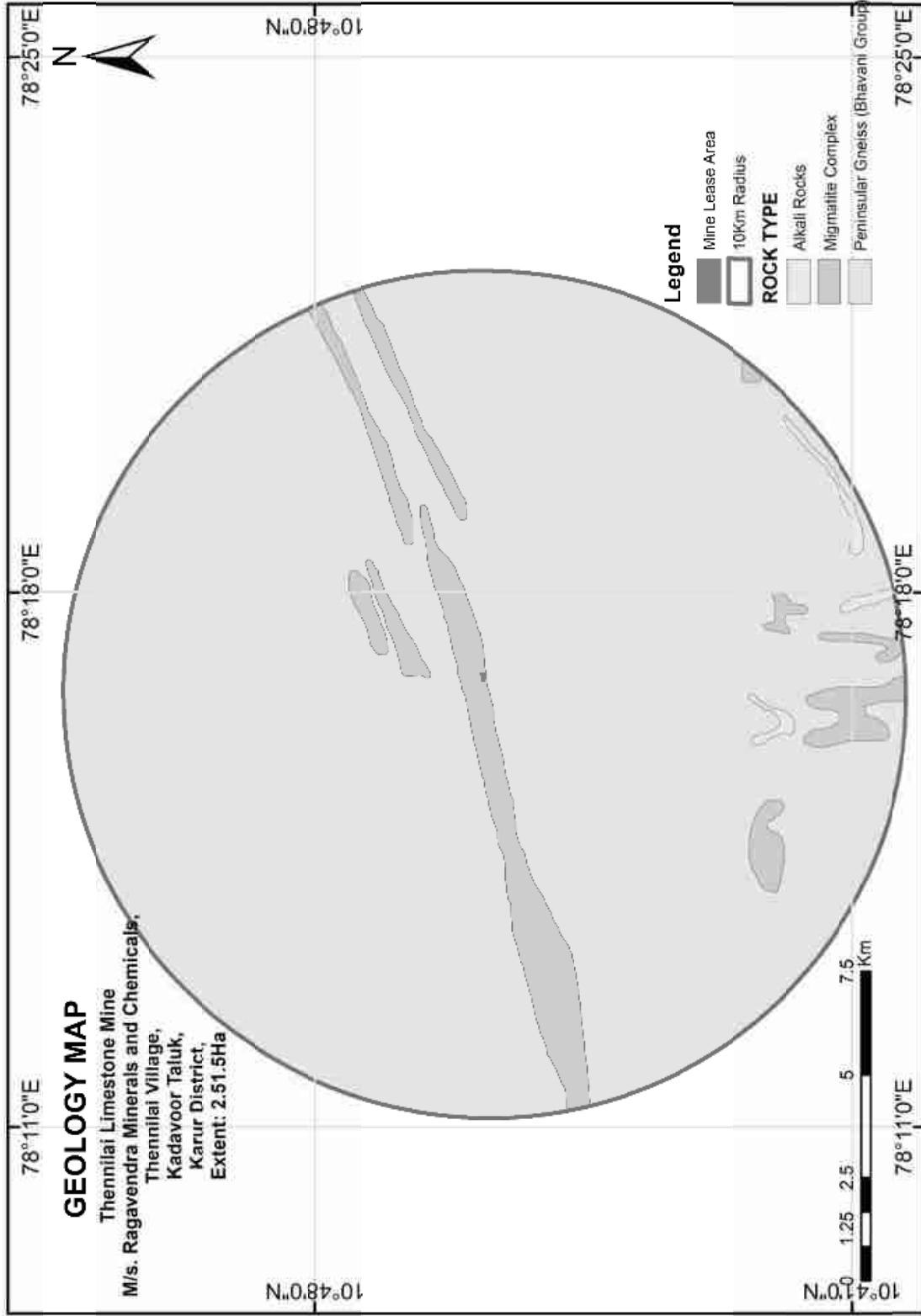
SOURCE: Approved Review of Mining plan (2018-19 to 2022-23).

FIGURE 2.10: GEOLOGICAL SECTION OF THE AREA



SOURCE: Approved scheme of Mining plan (2018-19 to 2022-23).

FIGURE 2.11: GEOLOGY MAP OF THE AREA COVERING 10KM RADIUS



Source: Geological information system (GIS MAP)

2.4 QUALITY OF RESERVES

Exploration details as per UNFC.

- The proponent has carried out detailed exploration as per United Nation Framework Classification and re assessed the resources and reserves afresh with his consulting geologist.
- Six core drills (DBh1-DBh6) upto 33m depth in the year 2019 (March) from the working pit level of the lease.
- Exploration and chemical analysis details as given below

TABLE 2.4: CORE DRILLING DATA'S

No.of core drills	Latitude	Longitude	Depth of core drills (m)	Depth of deposition of limestone in (m)	Strata
DCD 1	10°45'47.85"N	78°16'46.21"E	33.1	174.1m-173.2m	Topsoil
				173.2m-141.0m	Limestone
DCD 2	10°45'48.28"N	78°16'47.68"E	33.2	174.2m-173.1m	Topsoil
				173.1m-141.0m	Limestone
DCD 3	10°45'49.37"N	78°16'51.38"E	17.9	158.9m-141.0m	Limestone
DCD 4	10°45'48.64"N	78°16'50.44"E	15.0	156.0m-141.0m	Limestone
DCD 5	10°45'47.93"N	78°16'49.52"E	15.2	156.2m-141.0m	Limestone
DCD 6	10°45'46.87"N	78°16'50.36"E	16.6	157.6m-141.0m	Granite-Gneiss

Table 2.5 CHEMICAL ANALYSIS TABLE

LIMESTONE	
PARAMETER	COMPOSITION %
Calcium Oxides (CaO)	48.42
Magnesium Oxides (MgO)	1.13
Iron (Fe ₂ O ₃)	0.44
Alumina as (Al ₂ O ₃)	1.03
Silica (SiO ₂)	7.28
Loss of Ignition (LOI)	41.70

The chemical analysis was carried out in the NABL laboratory in the period of 2021, the same was scrutinized by the IBM it was inferred that the quality of limestone is of cement grade.

TABLE 2.6 MINERAL RESERVES AS PER UNFC CLASSIFICATION

United Nations Frame work Classification (UNFC)	UNFC Code	In Million Tonnes	Grade
*Proved Mineral reserves	111	0.306	Cement grade
Probable Mineral Reserves	121 & 122		
Feasibility Mineral resources	211		
Pre feasibility Mineral resources	221 & 222	0.378	
Measured Mineral resource	331		
Indicated Mineral resources	332		
Inferred Mineral resource	333		
Reconnaissance Mineral Resource	334		
Total Reserves + Resources		0.684	

* Life of the Mine is 6 Years

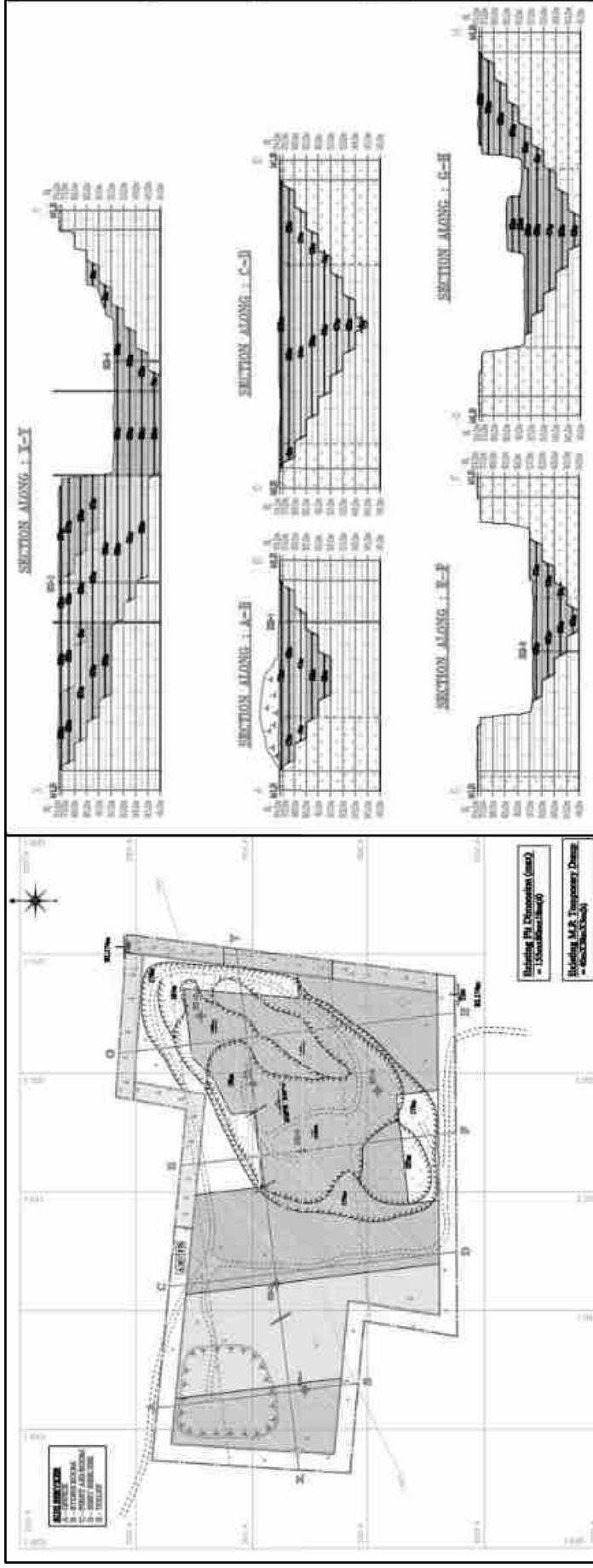
(Source Approved Scheme of Mining 2018-19 to 2022-23).

2.4.2 CALENDAR PROGRAM FOR ORE AND WASTE RATIO FOR THE PERIOD OF (2018-19 to 2022-23)

TABLE 2.7: CALENDAR PROGRAM FOR ORE AND WASTE RATIO FOR THE PERIOD OF (2018-19 to 2022-23)

YEAR	PIT NO.	TOTAL TENTATIVE EXCAVATION [cum]	TOPSOIL [cum]	OB/SB/I B [cum]	ROM		TOTAL WASTE [cum]	ROM / WASTE RATIO
					ORE [LIMESTONE @ 60% RECOVERY] [cum]	MINERAL REJECT 40% [cum]		
1	2	3	4	5	6	7	8	9
2018-19	1	19588	3379	7216	11753	7835	15051	1:1.28
2019-20		49716	2569	15056	29830	19886	34942	1:1.17
2020-21		16284	4032	5532	9770	6514	12046	1:1.23
2021-22		15116	-	2300	9070	6046	8346	1:0.92
2022-23		17220	-	464	10332	6888	7352	1:0.71
Total		117924	9980	30568	70754	47170	77738	1:1.10

FIGURE 2.13 YEARWISE DEVELOPMENT PRODUCTION PLAN AND SECTIONS 2019-20



Source : Approved Mining plan

2.5 METHOD OF MINING AND PROCESS DESCRIPTION.

- The method of mining is Open cast mechanized method categorized as “opencast category “A” other than fully mechanized”; Hydraulic Excavator coupled with tippers is deployed for the formation of benches and loading.
- There is no mineral processing or ore beneficiation proposed.
- Jack hammers with compressors deployed for drilling (short hole drilling), only slurry explosives are used for liberation of limestone from the parent sheet rock.
- Hydraulic Excavator attached with rock breaker is deployed for fragmentation to avoid secondary blasting as the strata are medium hard in nature.
- Hydraulic excavators are used for loading the limestone into trucks.
- Proposed bench height is 4m and 6m width with 60° slope.
- It is proposed to operate the mines in the earmarked area; the ultimate depth of the mine is 33m from the RL (174m to 141m).
- The anticipated waste will be dumped and utilized for backfilling the northern side of the lease area.

2.5.1 EXTENT OF MECHANIZATION:

TABLE 2.9: LIST OF MACHINERIES USED IN THE MINES

TYPE	NOS.	BUCKET CAPACITY	MAKE	MOTIVE POWER	H.P.
Hydraulic Excavator with Bucket or Rock Breaker Unit	2	1.1 to 1.9 CUM	TATA Hitachi	Diesel	150-250

TYPE	NO OF JACK HAMMER	DIA. OF HOLE	COMPRESSOR CAPACITY	MAKE	MOTIVE POWER	H.P
Tractor mounted compressor	1	32mm	140cfm	Atlas copco	Diesel	45
Portable Compressor	2	32 mm	250/150	Elga	Diesel	75

TABLE 2.10: DETAILS OF HAULING/TRANSPORT EQUIPMENT

TYPE	NOS.	CAPACITY	MAKE	MOTIVE POWER	H.P.
Comet Tipper	2	10/20Ts	Ashok Leyland	Diesel	90-180

2.5.2 DRILLING AND BLASTING:**TABLE 2.11 DRILLING AND BLASTING PARAMETERS**

S.NO	PARAMETERS	DESCRIPTION
1	Drilling Source	Jack hammer driven by the compressed air from tractor mounted compressor or Portable compressors.
2	Drilling parameters	Burden 0.7m spacing 0.8m depth 1.5m
3	Charge pattern	Charge 0.2 to 0.3kgs per hole. Stemming is 1/3 and explosives 2/3. The stemming material is moisture clay/ pyroxene mixed waste.
4	Initiation System	Bottom initiation system with safety fuses and ordinary or /plain electric detonators.
5	No of blast hole	Number of the hole required per day is 77, based on the above said parameters.
6	Powder factor	Powder factor is reported as 6Ts per kg of explosives.

2.5.3 STORAGE OF EXPLOSIVES:

Drilling and blasting will be carried out only when the hard strata encountered.

No magazine is available at mine sites. Agreement is made with authorized explosive dealer for supply of explosives under Form-22. The blasting will be done under the supervision of qualified blaster. The authorized explosive supplier will bring the required explosive in his approved van and take back the remaining explosive after blasting. There is no proposal for storing of explosives in the lease area.

Precaution during drilling & Blasting

- Preparation of charge and stemming of holes will be done by a qualified blaster.
- Sufficient warning signal will be given.
- Controlled blasting will be done using delay detonator to prevent fly rocks.
- Proper inspection will be carried out by the blaster after completion of blasting.

2.5.3 HANDLING OF TOP SOIL

Total Mineable reserves of Top soil is about 19,960Ts. Anticipated quantity of Top soil for this plan period (2018-19 to 2022-23) is 19,960Ts. The topsoil will be removed in the period of 2018-19 & 2019-20 is about 11,896Ts and temporarily dumped in West side of the area with the dimension of 33m (L) x 15m (W) x 12m (H). The top soil generated in the year of 2020-21 will be spread out in the backfilled area for greenbelt development.

2.5.4 WASTE MANAGEMENT

Total waste is about 2,02,118 Ts (Mineral rejects + Side burden). The anticipated waste of side burden and mineral reject during this period is 2,02,118 Ts.

- The mineral rejects generated during the previous period was dumped on the Western side the lease area.
- A portion of mineral rejects dump will be re-arranged to create space for dumping side burden and topsoil during first two years of the present plan period.
- The generated mineral rejects and side burden for the first and second year of the plan period (2018-19 & 2019-20) will be temporarily dumped over the existing re-arranged mineral rejects dump situated in the western side of the area.
- After the deposit has been exploited upto the ultimate pit depth in Northeastern side, the side burden will be removed and proposed to be backfill the excavated area and the topsoil will be spreading on the top of the backfilled area.
- The generated mineral rejects and side burden for the third, fourth and fifth years (2020-21 to 2022-23) of the plan period will be backfill on the Northeastern side of the area.

TABLE 2.12 WASTE DUMP DIMENSION

S.No	Description	Dump dimension and Location	
		2018-19	2019-20
1	Existing (Re-arranged) & Proposed Mineral rejects Temporary dump-I	48m X 35m X 9m(h) West	48m X 35m X 21m(h) West
2	Proposed Side burden Temporary dump II	38m X 30m X 6.5m(h) West	38m X 30m X 20m(h) West
3	Proposed Topsoil Temporary dump-III	33m X 15m X 7m(h) West	33m X 15m X 12m(h) West

The total waste will be dumped on the western side of the area and it will be utilized for backfilling on the North East side of the pit.

The waste /mineral rejects do not consist of any toxic substances in the form of solid, liquid and gas.

The manner of disposal of waste will be mechanical; the waste will be loaded into the dumpers with the help of excavator and unloaded in the earmarked area. The dump will be properly terraced of 5.0m height, and natural dump slope will be maintained. Parapet wall with weep hole will be constructed around the dumping area to prevent the run off during rainy seasons.

2.5.5 GREEN BELT DEVELOPMENT

During the previous plan period, it was proposed to plant predominant local species of Neem covering an area of 800 Sq.m with 70% survival rate in the northern boundary barrier of the lease area. Greenbelt was carried out and the survival rate of the plants was about 20%, due to scanty rainfall and alkaline soil nature.

In this present plan period 50 Numbers of saplings are proposed to be planted in the western boundary of the lease area with 3m X 3m spacing about 2,000 Sq.m is proposed for the greenbelt during the present plan period. At the end of the life of the mine the green belt area would be around 2,800Sq.m.

2.5.6 RECLAMATION AND REHABILITATION:

Reclamation and Rehabilitation is not proposed in the present scheme period. After the end of the life of the mine the mined out pit will be allowed to collect the rain water, the pit will be utilized as temporary storage reservoir which will enhance the ground water level.

2.6 GENERAL FEATURES.

Breakup of the land use and land cover within the lease area as approved in the SOM by the Indian Bureau of Mines, Chennai.

TABLE 2.13: LAND USE PATTERN OF THE LEASE AREA

S.NO	DESCRIPTION	PRESENT AREA (HA)	AREA TO BE RECLAIMED AT THE END OF PRESENT MS PERIOD(HA) [2018-19 TO 2022-23]	AREA AT THE END OF LIFE OF MINE (HA)
1	Mining (Quarry)	1.24.0	0.60.0	1.84.0
2.	Waste dump	0.15.2	Will be backfill	Will be backfill
3.	Office & infrastructure	0.01.0	-	0.01.0
4.	Processing plant	-	-	-
5.	Mineral stack processing yard	-	-	-
6.	Sub grade mineral stacks	-	-	-
7.	Mine roads	0.03.0	Nil	0.03.0
8.	Areas under plantation	0.08.0	0.20.0	0.28.0
9.	Un utilized area	1.00.3	0.35.5	0.35.5
Total		2.51.5		2.51.5

2.6.1 DRAINAGE PATTERN.

There are no streams, canals or water bodies crossing the project area, hence there is no requirement of stream deviation or canals in the near future.

2.6.2 TRAFFIC DENSITY:

Traffic density measurements were performed at one location at Karur – Vaiampatti road (SH-199), which is about 6KM in the west side as per IRC 1960 Guidelines. The monitoring was performed on 06-03-2019. Traffic density measurement were made continuously for 24 hours by visual observation and counting of vehicles under three categories, viz., heavy motor vehicles, light motor vehicles and two/three wheelers. As traffic densities on the roads are high, two skilled persons were deployed simultaneously at each station during each shift- one person on either direction for counting the traffic. At the end of each hour, fresh counting and recording was undertaken.

TABLE 2.14: TRAFFIC DENSITY

TRAFFIC VEHICLE	NO OF VEHICLE PER DAY PALAYAM – TRICHY ROAD
Heavy Vehicles	343
Light Vehicles	462
Three Wheelers	96
Grand Total	901

Total quantity of limestone to be transported from the mine to needy cement industries.

Total Quantity = 425 Ts of ROM per day

Total quantity of limestone = 255Ts per Day

Capacity of Tipper = 20Ts

No of vehicles for the transportation = 255Ts/20Ts

= 12 Trips Maximum per day

This transportation will not have significant impact on the existing traffic density/ existing road. The transported vehicles are likely to move in the MDR and State Highways. The haulage road does not enroute any nearby villages.

2.6.3 MINERAL BENEFICIATION AND PROCESSING

There is no proposal for the mineral processing or ore beneficiation in the mine lease area.

2.7 PROJECT REQUIREMENT

2.7.1 WATER SOURCE & REQUIREMENT

Detail of water requirements in KLD as given below:

2.15 WATER REQUIREMENT

Purpose	Quantity	Source
Dust Suppression	0.4 KLD	Rainwater accumulated in Mine Pit
Green Belt	0.4 KLD	Rainwater accumulated in Mine Pit
Drinking Purpose	0.2 KLD	Approved Water Vendors
Total		1 KLD

Source: Prefeasibility report

Water shall be obtained from accumulated rainwater/seepage water in mine pits. Packaged Drinking Water is available from the nearby approved water vendors.

2.7.2 POWER, AND OTHER INFRASTRUCTURE REQUIREMENT

The project does not require power supply for the mining operations. The Mining activity is proposed during day time only (General Shift 8 AM – 5 PM, Lunch Break 1 PM – 2 PM). Electricity for use in office and other internal infrastructure will be obtained from SEB. There is no DG set in the mine site.

The temporary infrastructures such as Mine Office, First Aid Room, Rest Shelter etc., are available in the mine lease area. No workshops are proposed inside the mine lease area hence there will not be any process effluent generation from the mine lease area. Domestic effluent from the mine office will be discharged to septic tank and soak pit. There is no toxic effluent expected to generate in the form of solid, liquid or gaseous form hence there is no requirement of waste treatment.

2.7.3 FUEL REQUIREMENT

High speed Diesel (HSD) will be used for mining machineries. Diesel will be brought from nearby Fuel Stations.

One Hydraulic Excavator will excavate and loading into the tippers about 60Ts/Hour

Hydraulic Excavator will consume about 16Ltrs per hour

Hence total production per day 490Ts of ROM per day

490Ts /60Ts per hour = 8 Hours (1Hydraulic Excavators will be deployed)

= 8 Hours X 16 Liters

= about 128 Liters per day of HSD

Besides other accessories like compressor etc., 20 liters will be utilized per day.

Hence it is computed as average **130-150Ltrs** of HSD per day will utilized in the mining operation.

2.7 EMPLOYMENT REQUIREMENT:

The local labors have been engaged for Mining of limestone, loading and handling of mineral in mining area, watch and ward and plantation activity for proper maintenance.

Beside the proponent engaged skilled and managerial staff to meet the statutory requirement under MMR 1961 and MCDR 1988. At present, the mine is not operational. The following skilled

/ unskilled and semi-skilled workers besides managerial and administrative staff shall be proposed to be deployed at the time of re-opening of mine.

TABLE 2.16: EMPLOYMENT POTENTIAL

PRESENT EMPLOYMENT POSITION		ADDITIONAL REQUIREMENTS DURING THE MP PERIOD
Mining Engineer (Part time)	-	1
Geologist (Part time)	-	1
Skilled labour		-
Foreman	2	-
Mate cum Blaster	1	
Mines office clerk (full time)	1	
Supervisor	1	
Semi-Skilled		
Drivers	6	
Un skilled labour	15	
TOTAL	26	2

2.8 PROJECT IMPLEMENTATION SCHEDULE

The limestone mines were in operation from 1998 to 2016 and were temporarily stopped from 16.12.2016 to till date (Please refer the Deputy Director Letter enclosed as Annexure No III). The commercial operation will commence after the grant of Environmental Clearance. CTO and CTE will be obtained from the consent authority. The conditions imposed during the Environmental Clearance will be compiled before the start of mining operation.

TABLE 2.17 EXPECTED TIME SCHEDULE FOR THE PROJECT

Sl. No.	Particulars	Time Schedule (In Month)*					Remark if any
		1 st	2 nd	3 rd	4 th	5 th	
1	Environmental Clearance						
2	Consent To Establish						Project Establishment Period
3	Consent To Operate						Production Start Period

*Time line may vary; subjected to rules and regulations /& other unforeseen circumstances

TABLE 2.18 CAPITAL COST ESTIMATION

S.No	Description	Expenditure
1	Fixed asset Cost	Rs 8,03,000
2	Operational Cost	Rs 11,00,000
3	EMP Cost	Rs 2,28,500

Total Project Cost	Rs 21,31,500/-
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Source: Prefeasibility Report

2.8.1 POST MINING LAND USE:

TABLE 2.19: POST LAND USE PATTERN OF THE LEASE AREA

S.NO	DESCRIPTION	AREA AT THE END OF LIFE OF MINE (HA)
1	Mining (Quarry)	1.84.0
2.	Waste dump	Will be backfill
3.	Office & infrastructure	0.01.0
4.	Processing plant	-
5.	Mineral stack processing yard	-
6.	Sub grade mineral stacks	-
7.	Mine roads	0.03.0
8.	Areas under plantation	0.28.0
9.	Un utilized area	0.35.5
Total		2.51.5

After complete exploitation of the limestone mineral from the lease area, the mined out pit will be allowed to collect the rain water which will act as a temporary reservoir, this temporary storage of water will act as an artificial recharge pond which will enhance the ground water level and the static level of the nearby wells.

Adequate measure will be taken care for constructing wall around the mined out area with 2mts height and fenced as per the rules. A watchman (Security guard) will be posted around the clock to prevent inherent entry of public and cattle. During rains the accumulated/stagnated water will be pumped out by means of temporary electric source with 5 Hp motor and the water will be utilized for greenbelt.

3. DESCRIPTION OF ENVIRONMENT

3.0 GENERAL

Study area

For the description of baseline environmental scenario, the mine area has been considered as the *core zone*. The area falling within a distance of 10Km from the boundary of the core zone has been considered as the *buffer zone*. The core zone and the buffer zone, combined together is referred to as the *study area* for determination of baseline status and assessment of environment impacts.

Study period

The Base line environmental quality represents the background scenario of various environmental components in the study area. The initiated steps to carry out Environmental Impact Assessment over a radial distance of 10Km around the mine during **Post monsoon season** covering the **months of December 2021 to February 2022**.

Sources of Environmental data

Baseline Environmental study was carried out in an area of 10 Km around the mine lease. The baseline information on micro-meteorology, ambient air quality, water quality, noise levels, soil quality and floristic descriptions are drawn from the data's generated by KGS Enviro Laboratory Pvt Ltd., NABL Accredited Testing Laboratory (ISO/IEC 17025:2017) and meteorological data collected from the nearest IMD (Indian Meteorological Department) station located in Trichy vide index No TRY-43344.

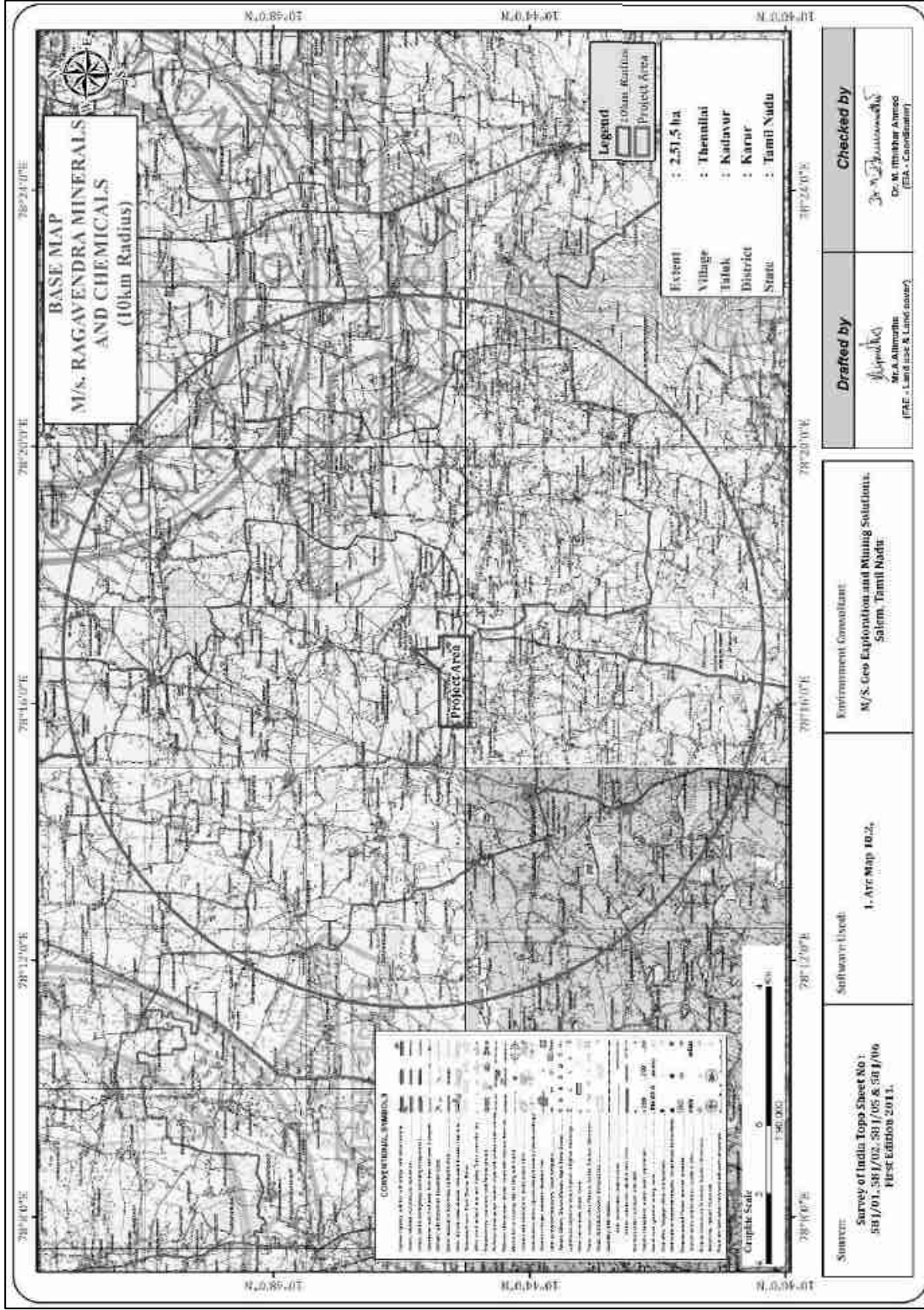
Apart from these, secondary data have been collected from District Census Handbook, Revenue Records, Statistical Department, Soil Survey and Land use Organization, District Industries Centre, Forest Working Plan, Forest Department, Central Ground Water Authority, etc., The generation of primary data as well as collection of secondary data and information from the site and surroundings was carried out during Post-monsoon season i.e. **December 2021 to February 2022**.

TABLE 3.1: ENVIRONMENTAL MONITORING ATTRIBUTES AND FREQUENCY OF MONITORING

ATTRIBUTE	PARAMETERS	FREQUENCY OF MONITORING	PROTOCOL
Meteorology	Wind Speed Wind Direction Temperature Rainfall	1 Hourly Continuous Mechanical/Automatic Weather Station	IS 5182 Part 1-20 Secondary Data from IMD Station.
Ambient Air Quality	PM ₁₀ PM _{2.5} SO ₂ NO _x CO.	24 hourly twice a week (December 2021 to February 2022)	IS 5182 Part 1-23 National Ambient Air Quality Standards, CPCB
Water Quality	Physical, Chemical and Bacteriological Parameters	Once during the study period	IS 10500 IS 3025 IS 2488 (Part 1-5)
Ecology	Existing Flora and Fauna	Through field visit during the study period.	Primary Survey by Quadrat & Transect Study
Noise Levels	Background Noise Levels in the study area	Hourly observation for 24 hours per location	IS 9989 As per CPCB Guidelines
Soil Characteristics	Physio-Chemical Characteristics	Once during the study period	IS 2720
Landuse	Landuse Pattern within 10 KM radius of the study area	Data's from census handbook 2011 and from the satellite imagery	Satellite Imagery Primary Survey
Socio Economic Aspects	Socio-Economic Characteristics, Population Statistics and Existing Infrastructure in the study area.	Census handbook, 2011	Primary survey, census handbook & need based assessments.

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

FIGURE 3.1: BASE MAP OF THE STUDY AREA



Source: Survey of India Topo sheet, 11th Edition, 2011 BW- Bore water, PW - Pit water, S- Soil, N- Noise, AAQ- Ambient Air quality,

3.1 LAND ENVIRONMENT

3.1.1 METEOROLOGY.

Sampling Methodology

The meteorology data recorded during the study period was useful for proper correlation and interpretation of the baseline information as well as for input to prediction models for air quality dispersion. It is characterized by a hot and dry summer from March – May, a monsoon or rainy season from October - December and winter season from January - March. The climate of the Karur District is generally warm. The hottest period of the year is generally from the months of March to May, the highest temperature raise up to 39⁰ C in April.

During field monitoring at study area various meteorological parameters were collected continuously by respective monitoring equipment's to record wind speed, wind direction, temperature and relative humidity.

The methodology adopted for monitoring field observations was as per the standard norms laid down by the Bureau of Indian Standards (IS: 8829) and Regional meteorological center under IMD (Indian Meteorological Department) situated in Trichy vide index No TRY-43344.

3.1.2 METEOROLOGICAL DATA RECORDED AT SITE

Period of Study

The meteorological parameters were recorded at site on hourly basis during the January 2022 and consist of parameters like, wind speed, wind direction, temperature and relative humidity.

Temperature

The prevailing climate in Karur is known as a local steppe climate. During the year, there is little rainfall in Karur. According to Köppen and Geiger, this climate is classified as BSh. The average temperature in Karur is 28.7 °C. The average annual rainfall is 595 mm. The driest month is March. There is 8 mm of precipitation in March. Most precipitation falls in October, with an average of 166 mm. With an average of 31.5 °C, May is the warmest month. In December, the average temperature is 25.6 °C. It is the lowest average temperature of the whole year. The precipitation varies 158 mm between the driest month and the wettest month. The average

temperatures vary during the year by 5.9°C. The nearest IMD station is Karur paramathy vide index No KPM -43342.

Relative Humidity

The climate of the district on the whole is slightly humid. The driest months are February and March with average relative humidity of about 40% in the forenoons. During the rainy months the average humidity is appreciably below the saturation level. Skies are generally clear or lightly clouded during the period December 2021 to February 2022.

3.1.3 LAND USE/ LAND COVER:

Land use pattern of the area is studied through the Bhuvan (ISRO). The interpretation made visually by identifying the land use cover through the keys given in the map. In the study area 10Km map radius map has been taken for the analysis of land use cover.

Since the mining is carried out by opencast category “A” other than fully mechanized method, studies on land environment of eco-system play an imperative role in identifying susceptible issues and taking appropriate action to uphold ecological equilibrium in the region. The main objective of this section is to provide a baseline status of the study area covering 10Km radius around the proposed mine site so that temporal changes due to the mining activities on the surroundings can be assessed in future.

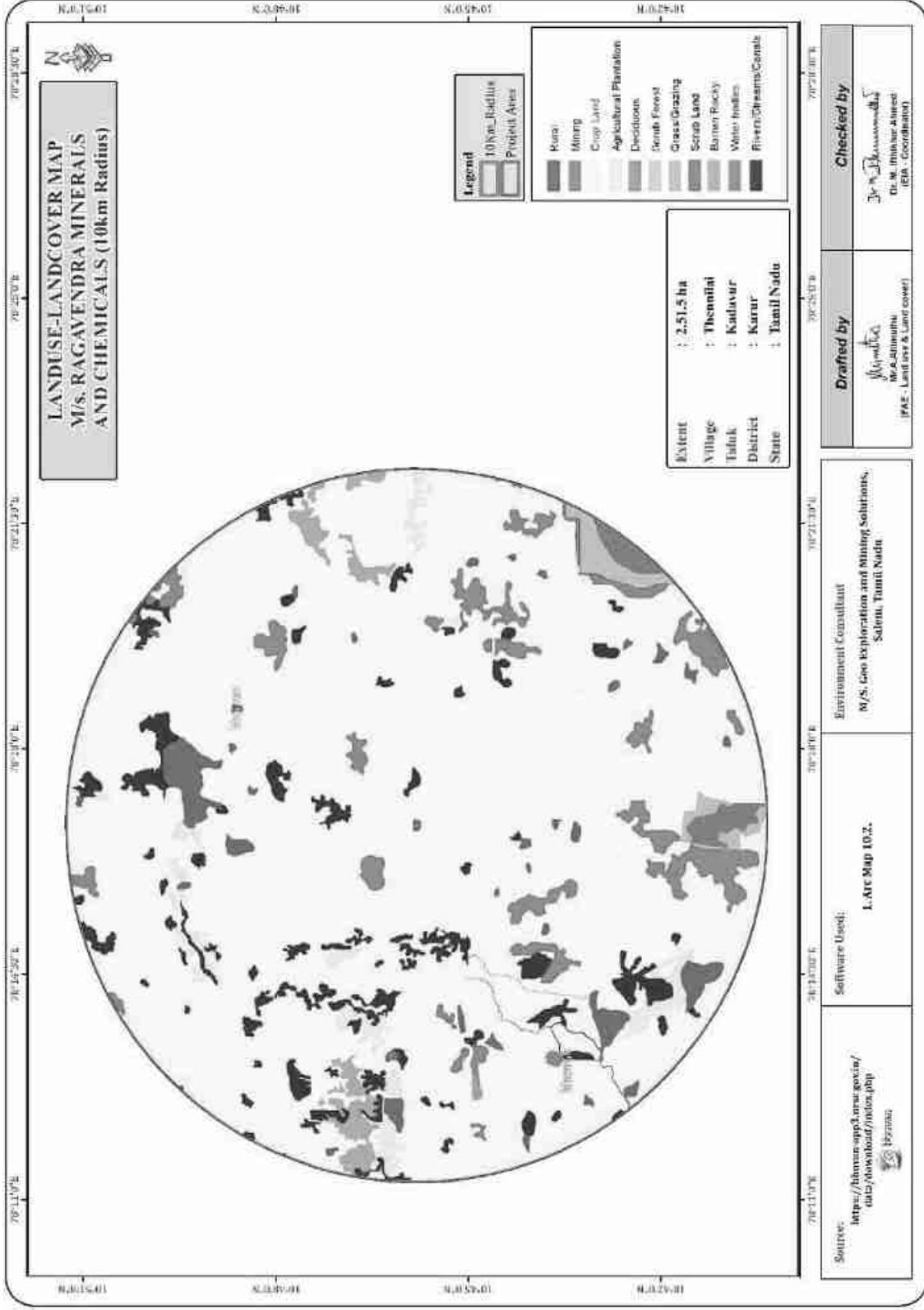
3.1.4 DESCRIPTION OF LAND USE

The distribution of lands within the buffer zone was computed based on the Bhuvan (ISRO) details.

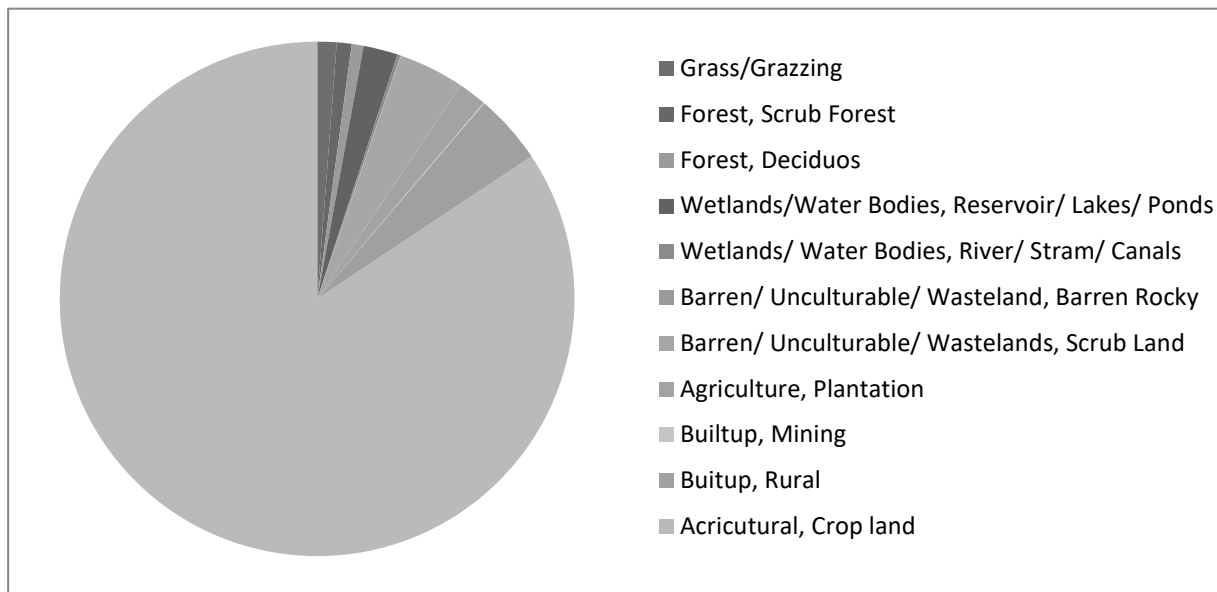
TABLE 3.2: LANDUSE COVER TABLE 10KM RADIUS

Sl.No	Classification	Area in ha.	Area in %
1	Grass/Grazing	391.84	1.22
2	Forest, Scrub Forest	302.54	0.94
3	Forest, Deciduos	241.62	0.75
4	Wetlands/Water Bodies, Reservoir/ Lakes/ Ponds	693.09	2.15
5	Wetlands/ Water Bodies, River/ Stream/ Canals	62.60	0.19
6	Barren/ Unculturable/ Wasteland, Barren Rocky	16.60	0.05
7	Barren/ Unculturable/ Wastelands, Scrub Land	1331.90	4.13
8	Agriculture, Plantation	573.15	1.78
9	Builtup, Mining	16.56	0.05
10	Buitup, Rural	1423.89	4.42
11	Agricultural, Crop land	27180.84	84.32

FIGURE 3.2: LAND USE LAND COVER MAP OF THE STUDY AREA



Source: Bhuvan ISRO on LISS III image.

FIGURE 3.3: LAND USE AND LANDCOVER CHART**Interpretation:**

Most of the study area is covered by the agriculture land which depends upon the seasonal vegetation. In the study area total mining areas cover about 0.05%, in this mining area the project area over an extent of 2.51.5ha contribute 15.1% which will not have any significant impact on the environment.

3.1.5 ENVIRONMENTAL FEATURES IN THE STUDY AREA

No major eco-system / biosphere reserves have been identified within the periphery of the project study area. Details of the important features along with other sensitive ecological locations in the study area are provided in the following table.

TABLE 3.3: ENVIRONMENTAL SETTINGS IN THE STUDY AREA

S.NO	SENSITIVE ECOLOGICAL FEATURES	NAME	ARIAL DISTANCE IN KM FROM MINE LEASE BOUNDARY
1	National Park –Wild life sanctuaries	None	Nil within 10Km Radius
2	Reserve forest	None	Nil within 10Km radius
3	Lakes/Reservoir/Dams	Punjabattikulam	5.5Km-NE
		Tharagampatti Kulam	7Km-SW
		Karunakulam	7.5Km-NW
		P.Udayapatti Kulam	3.5Km-NW
		Otta kulam	8.4Km-NW

4	Tiger Reserve/Elephant Reserve	None	Nil within 10Km Radius
5	Core Zone of Biosphere Reserve	None	Nil within 10Km Radius
6	Migratory birds	None	Nil within 10Km Radius
7	Stream/Rivers	Kaveri river	21Km Northeast side
		Ponniyaru Dam	20Km Southwest side
8	Mangroves	None	Nil within 10Km Radius
9	Mountains/Hills	None	Nil within 10Km Radius
10	Notified Archaeological sites	None	Nil within 10Km Radius
11	Industries/Thermal Power Plants	None	Nil within 10Km Radius
12	Defense Installation	None	Nil within 10Km Radius

3.1.6 TOPOGRAPHY:

The area is almost plain terrain. The general slope of the area is towards South East, maximum elevation of the area is 174m above MSL. The nearest village is Thennilai village which is about 1.5Km from the west side of the lease area. There are no hilly regions in and around the area.

3.1.7 DRAINAGE PATTERN OF THE AREA.

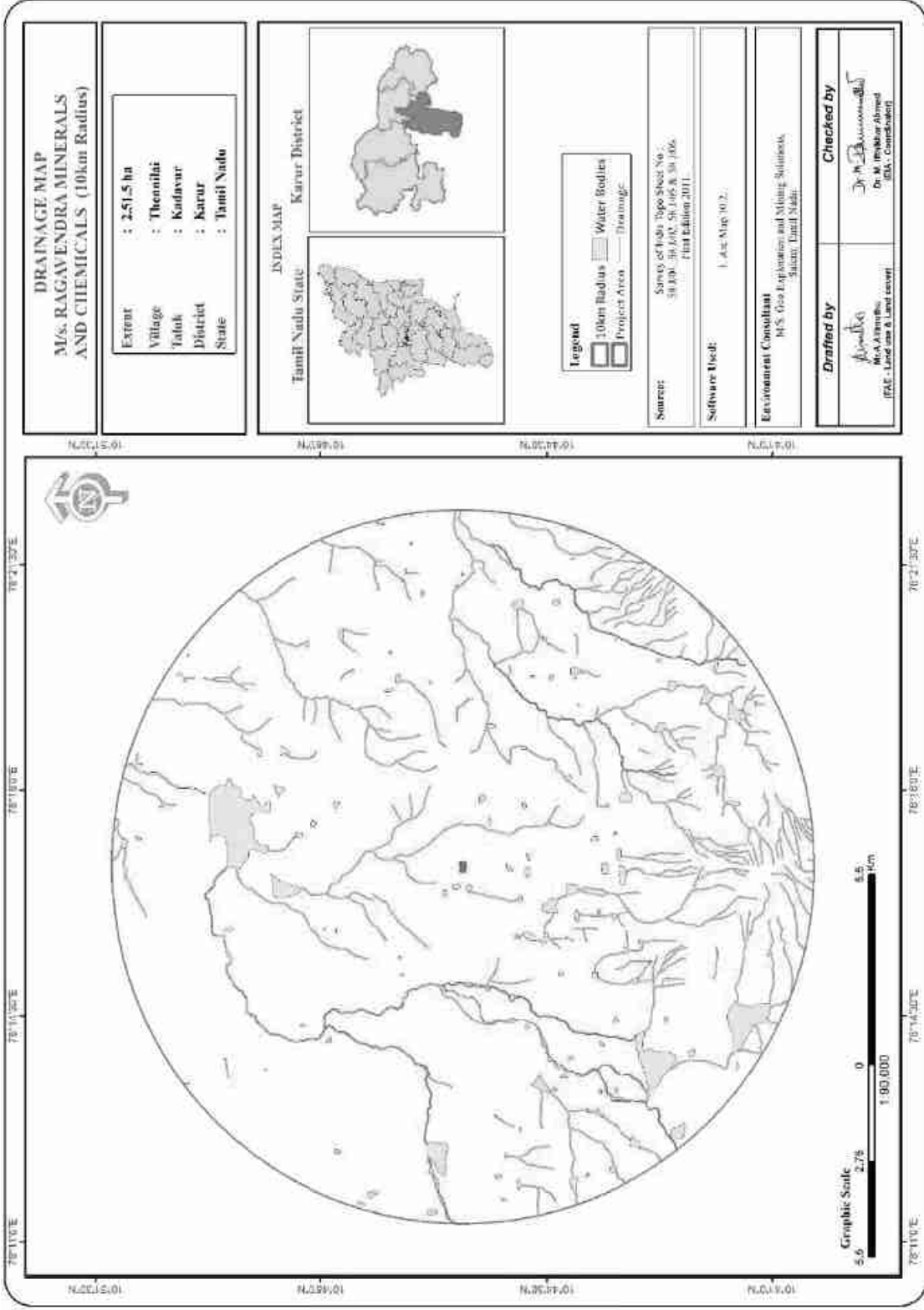
There are no developed surface drainage channels in the ML area. All the rivers are ephemeral in nature. The area is studded with numerous tanks that serve as the source of drinking water and also their surplus feeds adjoining tanks. The area is mostly dry in all seasons except rainy seasons.

The general drainage pattern of the area is of sub dendritic and dentritic pattern. No prominent water course or nallah is inferred. During rainy season the surface runoff flows in N to S direction. The drainage pattern of the study area is given in Fig. 3.4.

3.1.8 SEISMIC SENSITIVITY

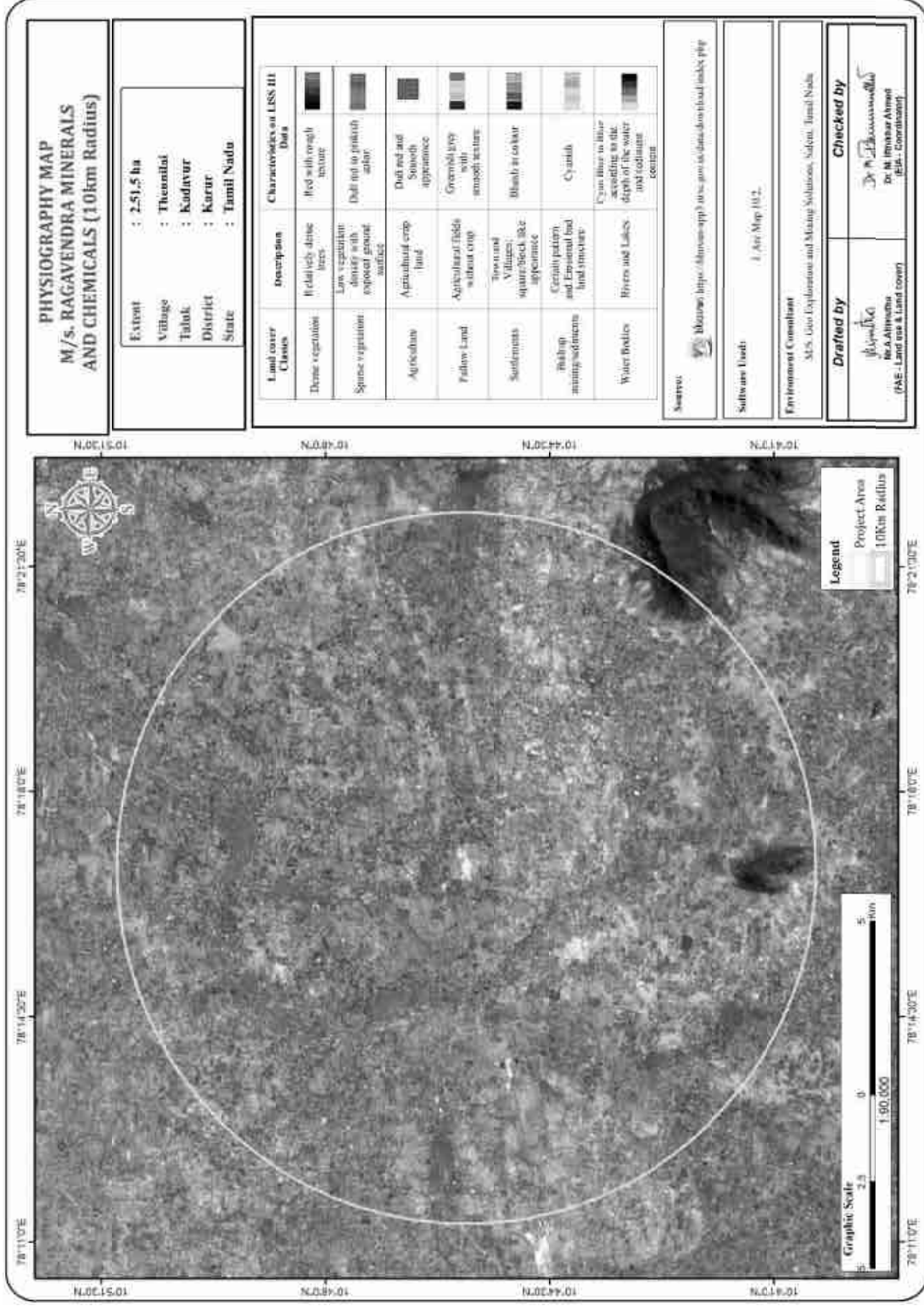
Zone II, low damage risk zone as per BMTPC, Vulnerability Atlas of Seismic zone of India IS: 1893 – 2002. No history of such incidents in the area. The mine lease falls in the sedimentary terrain on the peninsular shield of south India which is highly stable.

FIGURE 3.4: DRAINAGE MAP OF THE STUDY AREA COVERING 10KM RADIUS



Source: Digitized in Geographical Information System (ARC GIS)

FIGURE 3.5: PHYSIOGRAPHY MAP OF THE STUDY AREA



3.1.9 SOIL CHARACTERISTICS:

The soil is developed by the weathering of the rocks present in nature and differentiated into horizons of various heights and characters. The soil is a natural medium for plant growth and supplies the required nutrients to the growing plants. Some soils are very productive that contain adequate amounts of all essential elements in the form readily available to plants. For good plant growth the soil should also be in good physical condition which ensures proper supply of air and water.

The objective of the soil sampling is: -

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

The Soil Productive Capacity can be evaluated by determining Physio-Chemical characteristics of the soil. Five Samples of Soil were collected from different locations for studying soil characteristics in the study area, the location of which is listed in Table 3.4

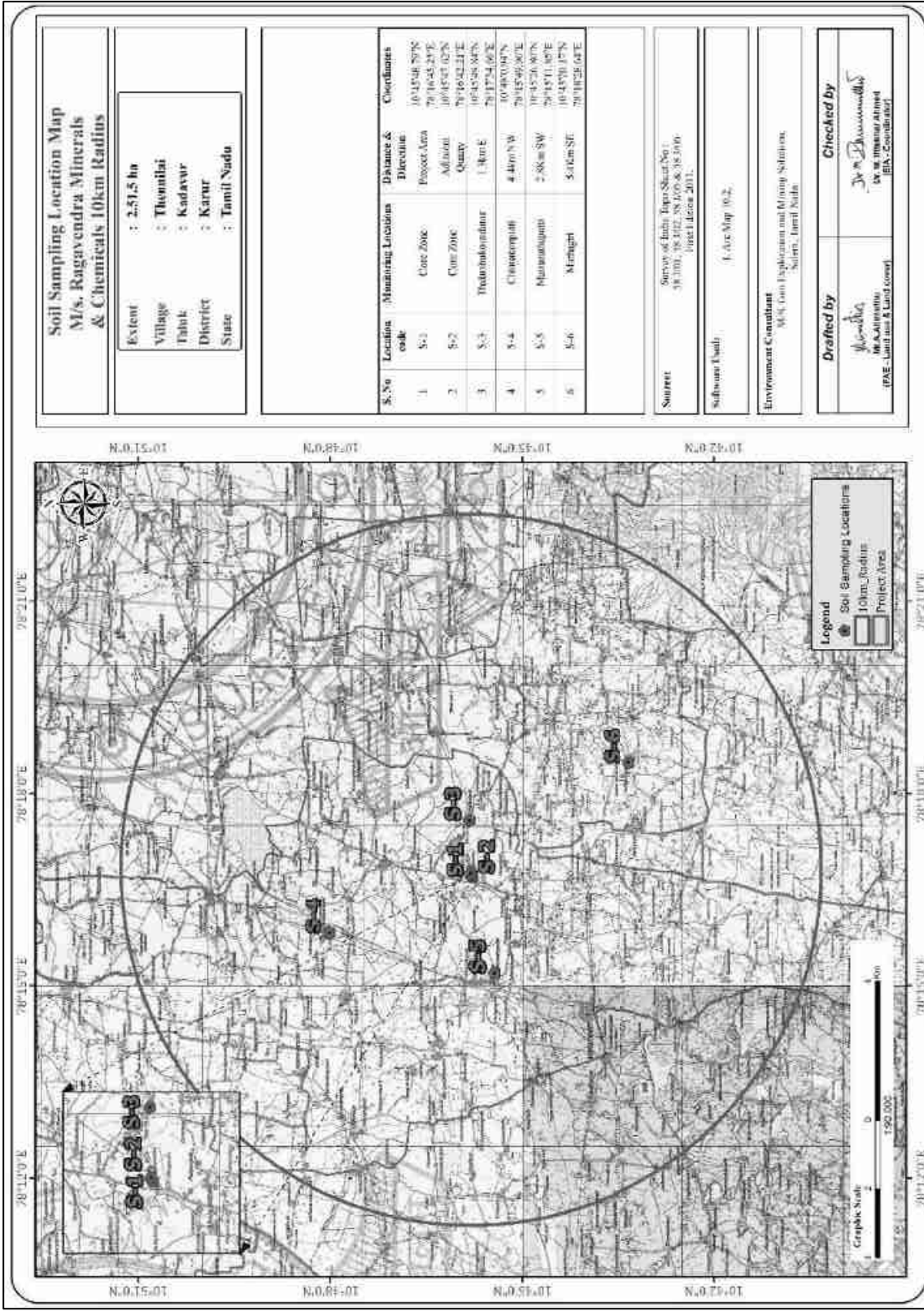
Methodology of Soil Monitoring –

It is most essential to obtain a representative sample of soil from an area in any study. A composite sample of an area is normally preferred. The soil sample was collected from different locations in the month of 23rd February 2022 by hand auger boring and from trial pit method up to the depth of 90 cm and transported to the laboratory and was spread for air drying. After proper drying of the soil, large stones and other similar objects were removed and the soil was grounded to break up aggregates and crumbs, and tested as per IS 2720. The results are given in Table 3.5.

TABLE 3.4: DETAILS OF SOIL MONITORING STATIONS

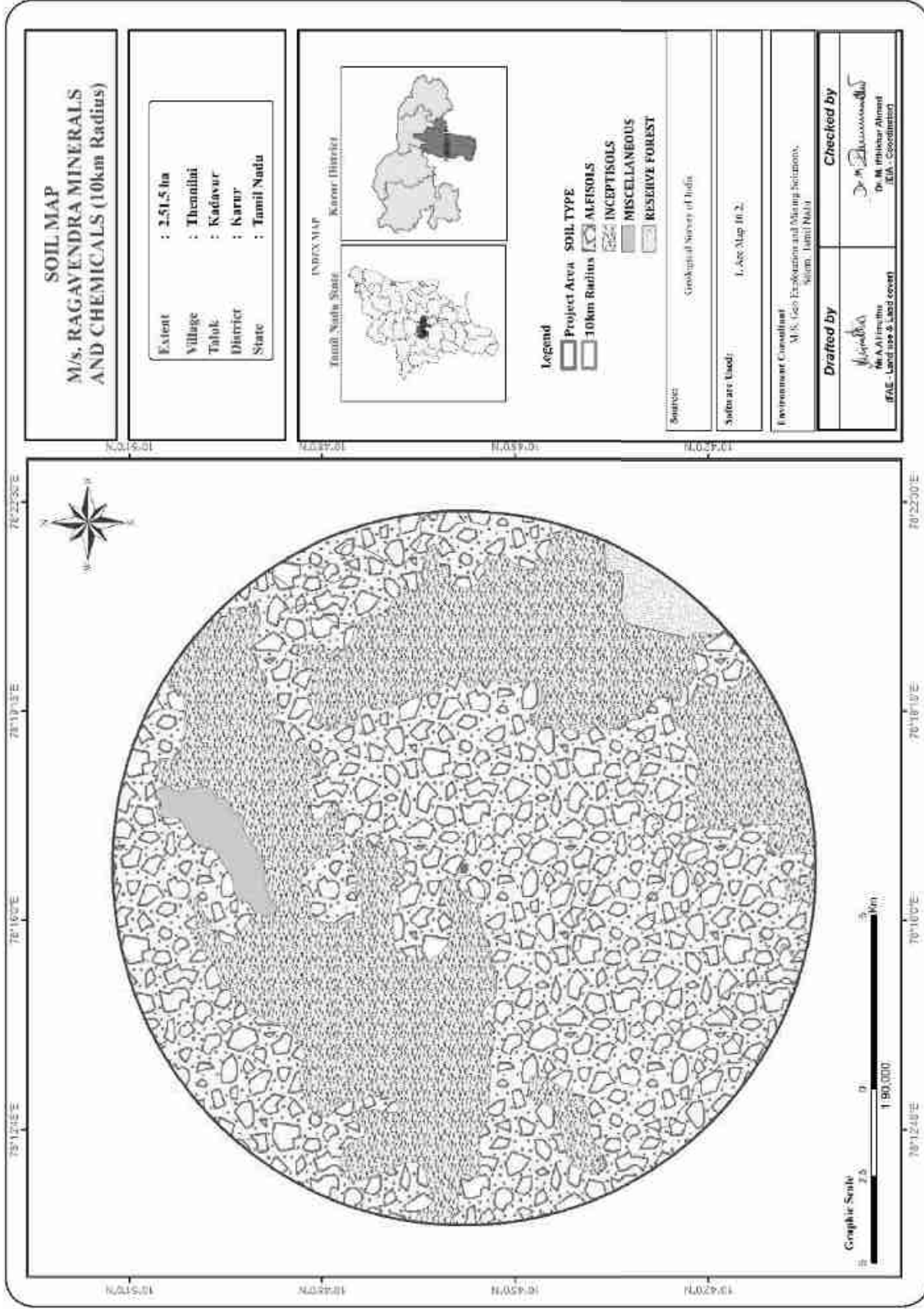
S. No	Location code	Monitoring Locations	Distance & Direction	Coordinates
1	S-1	Core Zone	Project Area	10°45'48.79"N 78°16'45.25"E
2	S-2	Core Zone	Adjacent Quarry	10°45'47.62"N 78°16'42.21"E
3	S-3	Thalambakoundanur	1.5km E	10°45'49.84"N 78°17'34.66"E
4	S-4	Chinnatampatti	4.3km NW	10°48'0.94"N 78°15'49.96"E
5	S-5	Mamarathupatti	2.5Km SW	10°45'26.80"N 78°15'11.85"E
6	S-6	Mathagiri	5.5Km SE	10°43'20.17"N 78°18'28.64"E

FIGURE 3.6: SOIL SAMPLES COLLECTION LOCATION MAP



Source : Survey of India Toposheet, 11th Edition, 2011

FIGURE 3.7: SOIL MAP OF THE STUDY AREA



Source: Geographical informatics system (GIS).

TABLE 3.5: SOIL QUALITY MONITORING DATA

Parameter	Unit	S-1 Core Zone	S-2 Core Zone	S-3 Thalambakoundanur	S-4 Chinnatampatti	S-5 Mamarathupatti	S-6 Mathagiri
1 pHat27°C	-	7.55	8.68	8.72	8.69	8.62	8.51
2 Electrical Conductivity at 25°C	µs/cm	410	555	453	370	415	425
3 Texture	-	Clay Loam	Clay Loam	Clay Loam	Clay Loam	Clay Loam	Clay Loam
4 Sand	%	35.5	35.1	32.1	36.6	37.1	32.6
5 Silt	%	37.4	33.5	38.5	32.5	35.0	34.5
6 Clay	%	27.1	31.4	29.4	30.9	27.9	32.9
7 Water Holding Capacity	%	45.8	46.1	40.8	49	44.1	49.1
8 Bulk Density	g/cc	1.16	1.03	0.94	1.16	1.13	1.02
9 Porosity	%	28.6	26.8	27.8	31.5	31.6	41
10 Exchangeable Calcium (as Ca)	mg/Kg	174	160.5	135	168	139	152
11 Exchangeable Magnesium (as Mg)	mg/Kg	20.6	18.6	25.4	35	21.5	24.3
12 Exchangeable Manganese (as Mn)	mg/Kg	32.4	31.1	27.5	32.9	18.5	27
13 Exchangeable Zinc (as Zn)	mg/Kg	0.51	0.31	0.94	1.08	1.31	0.59
14 Available Boron (as B)	mg/Kg	0.50	0.50	0.68	0.97	1.08	0.61
15 Soluble Chloride (as Cl)	mg/Kg	140	137.5	155	124	133	210
16 Soluble Sulphate (as S04)	mg/Kg	133	136	145	123	141	95
17 Available Potassium (as K)	mg/Kg	37.5	37.1	44	39.5	45	23
18 Available Phosphorous (as P)	Kg/hect	0.92	1.11	0.78	1.25	1.19	0.92
19 Available Nitrogen (as N)	Kg/hect	135	184	164.2	174.2	195	192
20 Cadmium (as Cd)	mg/Kg	BDL(DL:0.003)	BDL (DL:0.003)	BDL (DL:0.003)	BDL (DL:0.003)	BDL (DL:0.003)	BDL(DL:0.003)
21 Chromium (as Cr)	mg/Kg	BDL (DL:0.05)	BDL (DL:0.05)	BDL (DL:0.05)	BDL (DL:0.05)	BDL (DL:0.05)	BDL (DL:0.05)
22 Copper (as Cu)	mg/Kg	BDL (DL:0.05)	BDL (DL:0.05)	BDL (DL:0.05)	BDL (DL:0.05)	BDL (DL:0.05)	BDL (DL:0.05)
23 Lead (as Pb)	mg/Kg	0.75	0.55	0.80	1.55	1.17	0.41
24 Total Iron	mg/Kg	2.13	2.87	1.88	2.09	1.22	2.66
25 Organic Matter	%	1.36	1.96	2.29	2.20	1.68	1.68
26 Organic Carbon	%	0.79	1.14	1.33	1.28	0.98	0.98
27 CEC	meq/100g	40.8	44.7	37.8	41.9	45.3	38.1

* Desirable Range for High Production Soil

It is inferred that the soil quality is not suitable for agriculture.

3.1.10 SOIL STATUS

Interpretation:

It is observed that the pH of the Soil ranging from 8.55 to 8.62 indicating that the soils is Highly Alkaline in nature. The Electrical Conductivity of the Soil ranges from 370 to 555 indicating Low Conductivity. The concentration of Nitrogen is in the range 135 Kg/hect to 195 Kg/hect and the Potassium ranges 23 mg/kg to 45 mg/kg which are very low in concentration. The concentration of Chlorides is ranging from 124 to 210 mg/kg which are found to be on the higher side, this is due to the dispersion of chlorides from the limestone to the nearby areas. The soil found in the area is semi fertile soil.

3.2 WATER ENVIRONMENT:

3.2.1 SURFACE WATER:

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

General water level of the area falls between 40m to 37m (40m in summer and 37m in rainy season).

3.2.2 GROUND WATER CONDITIONS:

Groundwater occurs in all the crystalline formations of oldest Achaeans and Recent Alluvium. The occurrence and behaviour of groundwater are controlled by rainfall, topography, geomorphology, geology, structures etc.,

Ground water is occurring in pheratic conditions in weathered and fractured gneiss rock formation. The weathering is controlled by the intensity of weathering and fracturing.

3.2.3 METHODOLOGY:

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

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

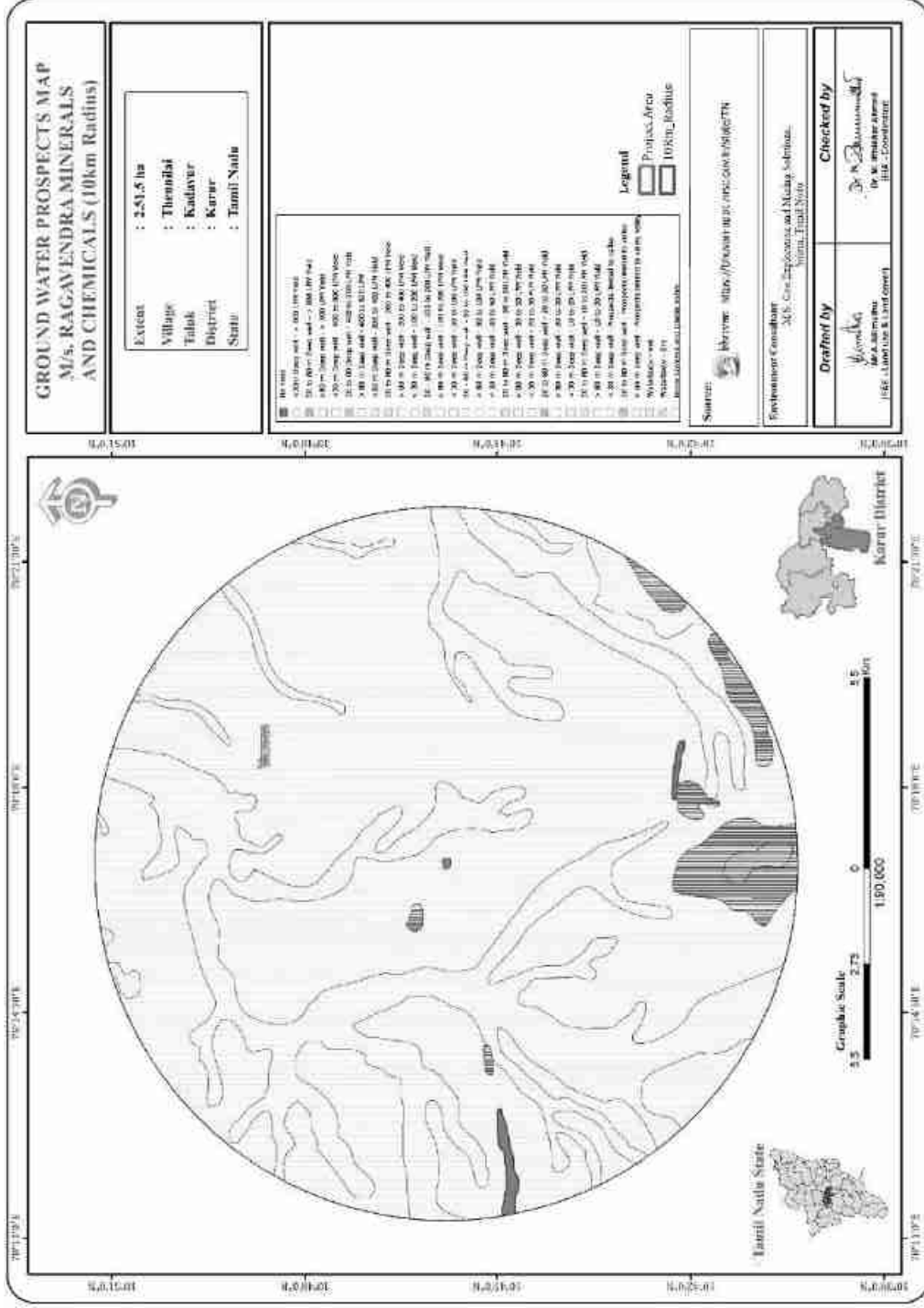
Two (2) surface water and Four (4) ground water samples were collected from the study area and were analyzed for physio-chemical, heavy metals and bacteriological parameters in order to assess the effect of mining and other activities on surface and ground water. The samples were analyzed as per the procedures specified by CPCB, IS-10500:2012 and 'Standard methods for the Examination of Water and Wastewater' published by American Public Health Association (APHA). The water sampling locations are given in Table 3.6 and shown as Figure 3.6.

TABLE 3.6: WATER SAMPLING LOCATIONS

S. No	Location Code	Monitoring Locations	Distance & Direction	Coordinates
1	SW-1	Tank Near Sheriwali	7.3km SW	10°43'2.27"N 78°13'51.47"E
2	SW-2	Core Zone (PIT WATER)	Project Area	10°45'47.74"N 78°16'49.50"E
3	WW-1	Thalambakoundanur	1.7km East	10°45'46.45"N 78°17'48.52"E
6	WW-2	Mathagiri	5.2Km SE	10°43'28.22"N 78°18'29.09"E
5	BW-1	Manjapallipatti	1.7km SW	10°45'5.24"N 78°16'10.10"E
6	BW-6	Chinnatampatti	4.3km NW	10°47'57.70"N 78°15'51.11"E

Source: On-site monitoring/sampling by Laboratories in association with GEMS

FIGURE 3.9: GROUND WATER LEVEL MAP OF THE STUDY AREA



Methodology for sample collection –

Water sample was collected in the month of February - 2022.

The sample was collected and analyzed as per IS-10500; IS-3025 & IS-2488 (Part 1-5). Grab sample of water was collected. Sample for chemical analysis was collected in polyethylene carboys. Sample for bacteriological analysis was collected in the sterilized bottle. Specified physio-chemical and Bacteriological parameters have been analyzed for projecting the existing water quality status in the study area.

Objective of Water sampling:–

- For rational planning of pollution control strategies and their prioritization.
- To assess nature and extent of pollution control needed in different water bodies or their part.
- To evaluate effectiveness of pollution control measures already in existence.
- To assess assimilative capacity of a water body thereby reducing cost on pollution control.
- To understand the environmental fate of different pollutants.
- To assess fitness of water for different uses.

Interpretation:**Surface Water****Ph:**

The pH varied from 7.19 to 7.28 while turbidity found within the standards (Optimal pH range for sustainable aquatic life is 6.5 to 8.5 pH).

Total Dissolved Solids:

Total Dissolved Solids varied from 380 to 421 mg/l, the TDS mainly composed of carbonates, bicarbonates, Chlorides, phosphates and nitrates of calcium, magnesium, sodium and other organic matter.

Other parameters:

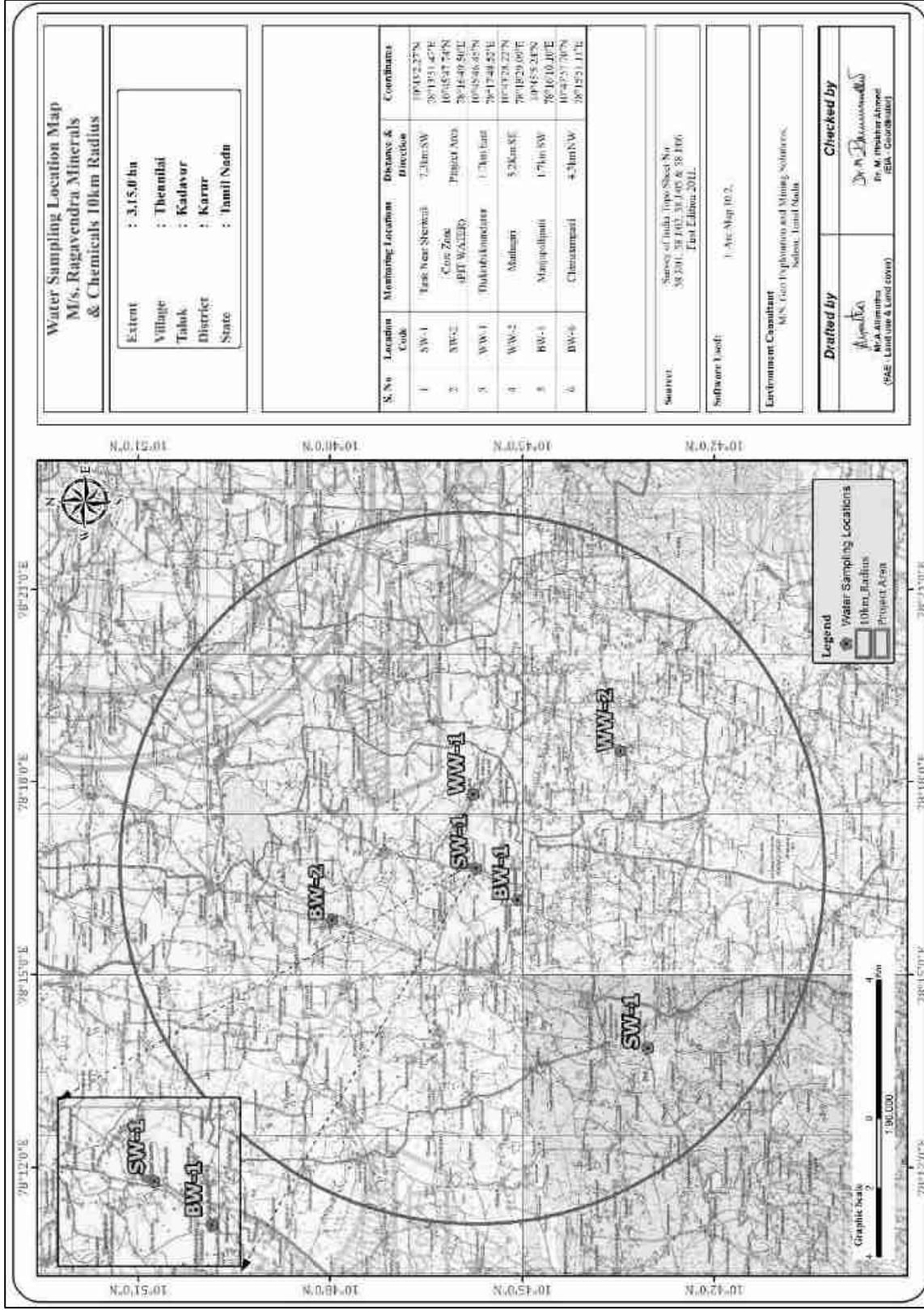
Chloride content is 84.6 - 110 mg/l. Nitrates varied from 5 to 7.5 mg/l, while sulphates varied from 31 to 34.1 mg/l.

Ground Water

The pH of the water samples collected ranged from 6.68 to 7.17 and within the acceptable limit of 6.5 to 8.5. pH, Sulphates and Chlorides of water samples from all the sources are within the limits as per the Standard. On Turbidity, the water samples meet the requirement. The Total Dissolved Solids were found in the range of 340 - 371 mg/l in all samples. The Total hardness varied between 116.1 – 151.5 mg/l for all samples.

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

FIGURE 3.10: WATER QUALITY MONITORING LOCATION



Source: Survey of India Toposheet, 11th Edition, 2011

TABLE 3.7: GROUND WATER SAMPLING RESULTS

S.NO	Parameter	Unit	WW1 Thalambakoundanur	WW2 Mathagiri	BW1 Manjappalipatti	BW2 Chinnatampatti
1	Color	Hazen	< 5	< 5	< 5	< 5
2	Odour	-	Agreeable	Agreeable	Agreeable	Agreeable
3	pH@ 25°C	-	6.68	7.17	7.10	6.96
4	Electrical Conductivity	µs/cm	620	605	576	628
5	Turbidity	NTU	< 1	< 1	< 1	< 1
6	Total Dissolved Solids	mg/l	366	357	340	371
7	Total Hardness as CaCO ₃	mg/l	137.0	151.5	116.1	136.06
8	Calcium as Ca	mg/l	21.8	28.6	23.5	28.5
9	Magnesium as Mg	mg/l	20.1	19.5	14	15.8
10	Total Alkalinity	mg/l	155	150.2	144	174
11	Chloride as Cl ⁻	mg/l	80.6	77.6	72.2	66
12	Sulphate as SO ₄ ⁻	mg/l	27	26.4	29	18.3
13	Iron as Fe	mg/l	0.15	0.12	0.15	0.16
14	Free Residual Chlorine	mg/l	BDL(DL: 2.0)	BDL(DL: 2.0)	BDL(DL: 2.0)	BDL(DL: 2.0)
15	Fluoride as F	mg/l	0.19	0.11	0.17	0.11
16	Nitrates as NO ₃	mg/l	7.3	10	13.2	11.5
17	Copper as Cu	mg/l	BDL (DL:0.2)	BDL (DL:0.2)	BDL (DL:0.2)	BDL (DL:0.2)
18	Manganese as Mn	mg/l	BDL (DL:0.05)	BDL (DL:0.05)	BDL (DL:0.05)	BDL (DL:0.05)
19	Mercury as Hg	mg/l	(BDL (DL: 0.0005)	(BDL (DL: 0.0005)	(BDL (DL: 0.0005)	(BDL (DL: 0.0005)
20	Cadmium as Cd	mg/l	BDL (DL:0.01)	BDL (DL:0.01)	BDL (DL:0.01)	BDL (DL:0.01)
21	Selenium as Se	mg/l	BDL (DL: 0.05)	BDL (DL: 0.05)	BDL (DL: 0.05)	BDL (DL: 0.05)
22	Aluminium as Al	mg/l	BDL (DL: 0.03)	BDL (DL: 0.03)	BDL (DL: 0.03)	BDL (DL: 0.03)
23	Lead as Pb	mg/l	BDL (DL:0.01)	BDL (DL:0.01)	BDL (DL:0.01)	BDL (DL:0.01)
24	Zinc as Zn	mg/l	BDL (DL:0.02)	BDL (DL:0.02)	BDL (DL:0.02)	BDL (DL:0.02)
25	Total Chromium	mg/l	BDL (DL: 0.05)	BDL (DL: 0.05)	BDL (DL: 0.05)	BDL (DL: 0.05)
26	Boron as B	mg/l	BDL (DL:0.1)	BDL (DL:0.1)	BDL (DL:0.1)	BDL (DL:0.1)
27	Mineral Oil	mg/l	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:1.0)
28	Phenolic Compounds	mg/l	Absent	Absent	Absent	Absent
29	Anionic Detergents	mg/l	BDL (DL:0.1)	BDL (DL:0.1)	BDL (DL:0.1)	BDL (DL:0.1)
30	Cynatide as CN	mg/l	Absent	Absent	Absent	Absent
31	Total Coliform	Per 100ml	< 2	< 2	< 2	< 2
32	E-Coli	Per 100ml	< 2	< 2	< 2	< 2
33	Barium as Ba	mg/l	BDL (DL:0.5)	BDL (DL:0.5)	BDL (DL:0.5)	BDL (DL:0.5)
34	Ammonia (as Total)	mg/l	BDL (DL:0.1)	BDL (DL:0.1)	BDL (DL:0.1)	BDL (DL:0.1)
35	Sulphide as HS	mg/l	BDL (DL:0.05)	BDL (DL:0.05)	BDL (DL:0.05)	BDL (DL:0.05)
36	Molybdenum as Mo	mg/l	BDL (DL:0.5)	BDL (DL:0.5)	BDL (DL:0.5)	BDL (DL:0.5)
37	Total Arsenic as	mg/l	BDL (DL:0.01)	BDL (DL:0.01)	BDL (DL:0.01)	BDL (DL:0.01)
38	Total Suspended Solids	mg/l	BDL (DL:2)	BDL (DL:2)	BDL (DL:2)	BDL (DL:2)

* IS: 10500:2012-Drinking Water Standards; # within the permissible limit as per the WHO Standard. The water can be used for drinking purpose in the absence of alternate sources.

Note : SW- Surface water, GW – Ground water.

TABLE 3.7A: SURFACE WATER SAMPLING RESULTS

S.NO	Parameter	UNIT	SW1 Tank Near Sheriwali	SW2 Core Zone (PIT WATER)
1	Color	Hazen	5	5
2	Odour	-	Agreeable	Agreeable
3	pH@ 25°C	-	7.28	7.19
4	Electrical Conductivity @ 25°C	µs/cm	714	642
5	Turbidity	NTU	2.5	4.1
6	Total Dissolved Solids	mg/l	421	380
7	Total Hardness as CaCO ₃	mg/l	180.6	165.6
8	Calcium as Ca	mg/l	35.5	31.8
9	Magnesium as Mg	mg/l	22.4	21
10	Total Alkalinity as CaCO ₃	mg/l	170	162
11	Chloride as Cl ⁻	mg/l	110	84.6
12	Sulphate as SO ₄ ⁻²	mg/l	34.1	31
13	Iron as Fe	mg/l	0.12	0.10
14	Free Residual Chlorine	mg/l	BDL(DL: 2.0)	BDL(DL: 2.0)
15	Fluoride as F	mg/l	0.13	0.13
16	Nitrates as NO ₃	mg/l	5	7.5
17	Copper as Cu	mg/l	BDL (DL:0.2)	BDL (DL:0.2)
18	Manganese as Mn	mg/l	BDL (DL:0.05)	BDL (DL:0.05)
19	Mercury as Hg	mg/l	(BDL (DL: 0.0005)	(BDL (DL: 0.0005)
20	Cadmium as Cd	mg/l	BDL (DL:0.01)	BDL (DL:0.01)
21	Selenium as Se	mg/l	BDL (DL: 0.05)	BDL (DL: 0.05)
22	Aluminium as Al	mg/l	BDL (DL: 0.03)	BDL (DL: 0.03)
23	Lead as Pb	mg/l	BDL (DL:0.01)	BDL (DL:0.01)
24	Zinc as Zn	mg/l	BDL (DL:0.02)	BDL (DL:0.02)
25	Total Chromium	mg/l	BDL (DL: 0.05)	BDL (DL: 0.05)
26	Boron as B	mg/l	BDL (DL:0.1)	BDL (DL:0.1)
27	Mineral Oil	mg/l	BDL (DL:1.0)	BDL (DL:1.0)
28	Phenolic Compounds as	mg/l	Absent	Absent
29	Anionic Detergents as	mg/l	BDL (DL:0.1)	BDL (DL:0.1)
30	Cynaide as CN	mg/l	Absent	Absent
31	Biological Oxygen	mg/l	8.1	5.7
32	Chemical Oxygen	mg/l	36	24
33	Dissolved Oxygen	mg/l	6	5.8
34	Total Coliform	Per 100ml	present	present
35	E-Coli	Per 100ml	present	present
36	Barium as Ba	mg/l	BDL (DL:0.5)	BDL (DL:0.5)
37	Ammonia-n (as Total	mg/l	1.1	1.3
38	Sulphide as H ₂ S	mg/l	BDL (DL:0.05)	BDL (DL:0.05)
39	Molybdenum as Mo	mg/l	BDL (DL:0.5)	BDL (DL:0.5)
40	Total Arsenic as As	mg/l	BDL (DL:0.01)	BDL (DL:0.01)
41	Total Suspended Solids	mg/l	8.3	10.2

3.3 AIR ENVIRONMENT:

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

The baseline studies on air environment include identification of specific air pollution parameters and their existing levels in ambient air. The ambient air quality with respect to the study zone of 10 km radius around the cluster forms the baseline information. The sources of air pollution in the region are mostly due to vehicular traffic, dust arising from unpaved village road and domestic & agricultural activities. The prime objective of the baseline air quality study was to establish the existing ambient air quality of the study area. These will also be useful for assessing the conformity to standards of the ambient air quality during the operation of proposed projects in cluster.

This section describes the identification of sampling locations, methodology adopted during the monitoring period and sampling frequency.

3.3.1 SELECTION OF SAMPLING LOCATIONS

Ambient air quality monitoring (AAQM) station was set up at eight locations in study area for sampling –

- (a) Particular matter (size less than 10 μm) (PM_{10}) g/m^3 , (b) Particulate matter (size less than 2.5 μm) ($\text{PM}_{2.5}$) g/m^3 , (c) SO_x , (d) NO_x , (e) CO (in g/m^3), (f) Pb, (g) Ozone (O_3) g/m^3 , (h) Ammonia (i) Benzene (C_6H_6) g/m^3 , (j) Benzo-(a) Pyrene- (BaP) (k) Arsenic (As) ng/m^3 , (l) Nickel-(Ni) ng/m^3 .

The baseline status of the ambient air quality has been assessed through a scientifically designed ambient air quality monitoring network based the downwind and up wind direction as curtained through micro meteorological monitoring and wind rose diagrams; Sampler away from source and other interferences (inlet 15m away from source/ traffic artery).

TABLE 3.8: AMBIENT AIR QUALITY MONITORING STATIONS

S. No	Location Code	Monitoring Locations	Distance & Direction	Coordinates
1	AAQ-1	Core Zone	Project Area	10°45'49.56"N 78°16'46.88"E
2	AAQ-2	Core Zone	Adjacent Quarry	10°45'50.35"N 78°16'41.16"E
3	AAQ-3	Thalambakoundanur	1.3km E	10°45'50.75"N 78°17'35.24"E
4	AAQ-4	Mamarathupatti	2.8Km SW	10°45'26.00"N 78°15'11.15"E
5	AAQ-5	Budwadi	4.0km NE	10°47'59.47"N 78°17'29.12"E
6	AAQ-6	Chinnatampatti	4.4km NW	10°48'0.53"N 78°15'49.25"E
7	AAQ-7	Mathagiri	5.4Km SE	10°43'18.94"N 78°18'32.13"E
8	AAQ-8	Mylampatti	4.5km SW	10°44'9.76"N 78°14'51.89"E

3.3.2 SITE SPECIFIC METEOROLOGY

Site specific meteorology during the study period was recorded by an automated weather station. Wind profile of the area is shown in the form of wind rose diagram given in Figure 3.11. Aeromod software version 9.1 was used to interpretation the air quality analysis.

3.3.3 CLIMATOLOGY:

The average temperature in Karur is 28.7 °C. The average annual rainfall is 595 mm. The driest month is March. There is 8 mm of precipitation in March. Most precipitation falls in October, with an average of 166 mm. With an average of 31.5 °C, May is the warmest month. In December, the average temperature is 25.6 °C. It is the lowest average temperature of the whole year. The precipitation varies 158 mm between the driest month and the wettest month. The average temperatures vary during the year by 5.9 °C

FIGURE 3.11: WIND ROSE DIAGRAM

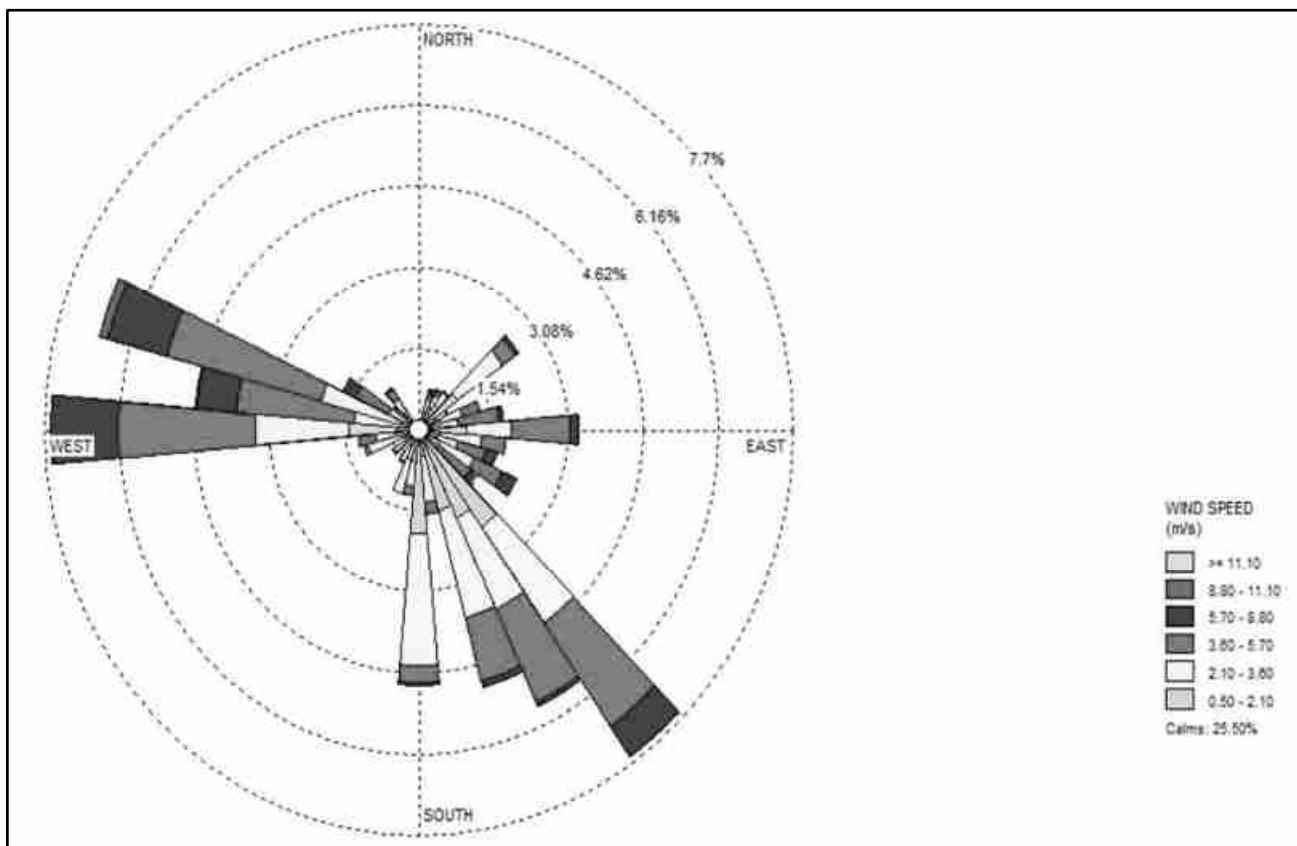
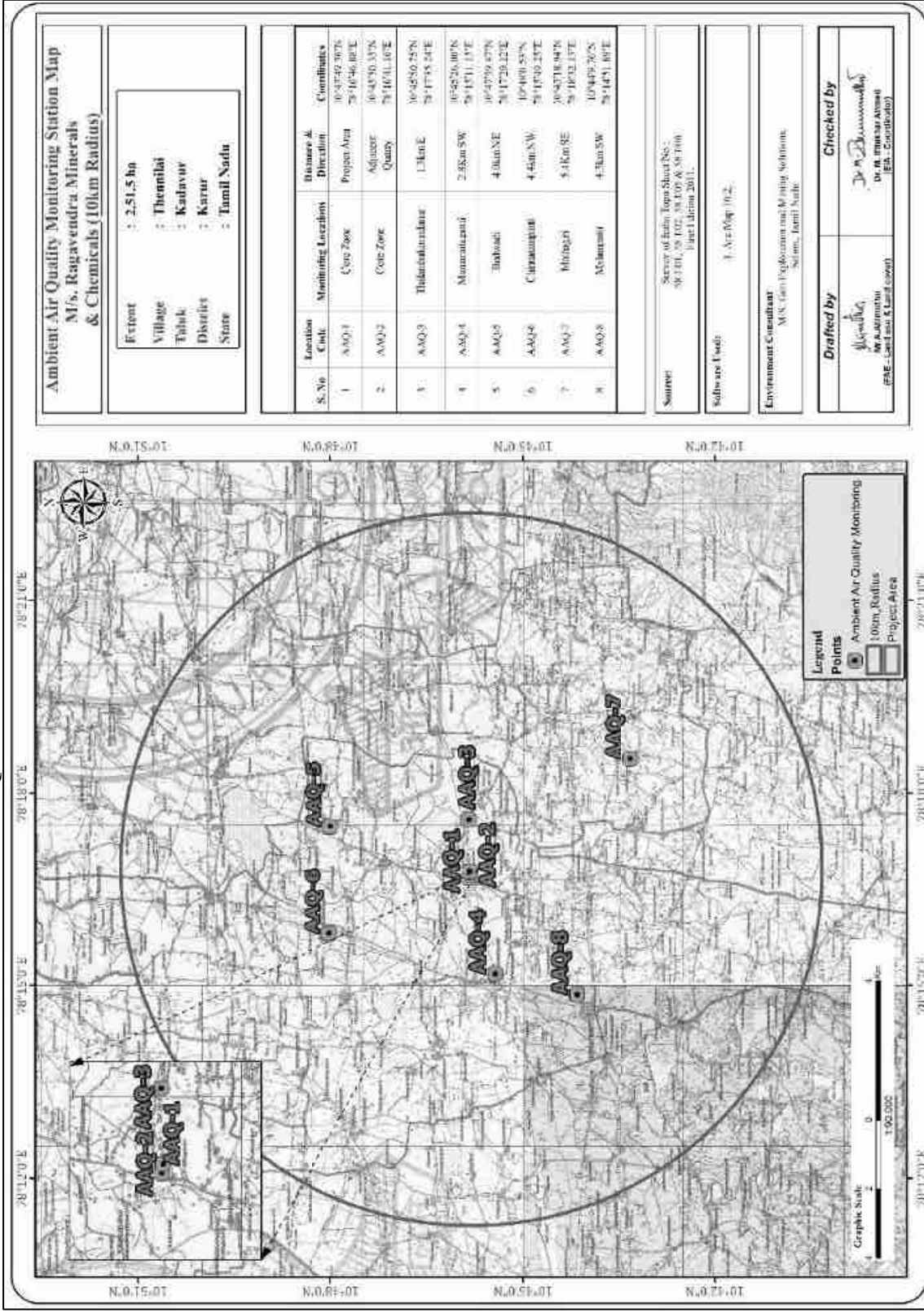


FIGURE 3.12: AIR QUALITY MONITORING LOCATION MAP



Source: Survey of India Toposheet, 11th Edition, 2011

3.3.4 AMBIENT AIR QUALITY

Objectives:–

- The prime objective of the baseline air quality monitoring is to evaluate the existing air quality of the area in conformity to NAAQS (National Ambient Air Quality Standards) 2009.
- To identify specific industrial and other sources of pollution.
- To assess health hazards and potential damage to property.
- To assess the pollution impacts on biotic environment.
- To collect data for formulating and testing air pollution models.

The results of monitoring during the study period (December 2021 to February 2022) are presented in the report.

3.3.5 PERIOD OF STUDY AND PARAMETERS

Ambient air quality monitoring was carried out at a frequency of 2 days per week at each location for three months. The baseline data of air environment was generated for the following parameters:

- Sulphur dioxide SO₂
- Oxides of Nitrogen NO_x
- Particulate Matter (Size Less than 10 µm) PM₁₀
- Particulate Matter (Size Less than 2.5 µm) PM_{2.5}
- Ozone O₃
- Lead Pb,
- Carbon Monoxide CO
- Ammonia NH₃
- Benzene C₆ H₆
- Benzo (a) Pyrene BaP
- Arsenic As
- Nickel Ni

3.3.6 INSTRUMENTS USED FOR SAMPLING & ANALYSIS

Ambient Air Monitoring Instruments:-

INSTRUMENT	MODEL NO.	RANGE AND SENSITIVITY	
Respirable Dust Sampler (RDS)	APM-450BL	0.40 – 1.5 m ³ /min ±0.02 m ³ /min (PM ₁₀)	0 – 3 LPM ± 0.2 LPM (gases)
Fine Particulate Sampler	APM 550	±0.03 DGM m ³ (PM _{2.5})	

3.3.7 SAMPLING AND ANALYTICAL TECHNIQUES

Testing Method followed for Ambient Air Quality: –

Particular	Testing Method to be Followed
A PM ₁₀	IS 5182 (Part-23) 2006
B PM _{2.5}	IS 5182 (Part-23) 2006
C SO ₂ (Sulfur Dioxide)	IS 5182 (Part-2) 2001, with Improved West & Gaeke Method
D NO _x (Oxides of Nitrogen)	Modified Jacobs – Hochheiser Method / Arsenite Method (IS 5182 Part 6) 2011

The air inlet has a circular symmetry so that air entry is unaffected by wind direction and is designed to keep out rain, insects and very large particles. The inlet section immediately leads to an impactor stage designed to trap particles with an aerodynamic diameter larger than 10 microns (Glass Fiber Filter size is 20.3 x 25.4cm). Thus the air stream in the down tube consists of only medium and fine particulates. The streamlined air flow of the down tube is accelerated through the nozzle of the well shaped impactor designed to trap medium size particulates with an aerodynamic diameter between 2.5 and 10 microns.

To avoid sampling errors due to the tendency of small particles to bounce off the impaction surface a 37mm diameter GF/A paper immersed in silicone oil is used as an impaction surface. The air stream leaving the WINS impactor consists of microns. These fine particles are collected on a special Teflon membrane filter of 47 mm diameter. Modified West and Gaeke method (IS 5182 part II, 2001) has been adopted for estimation of SO₂ and Arsenite Modified Jacob & Hochheiser has been adopted for estimation of NO_x. NH₃ by Indophenols blue Method, O₃ by Chemical method.

The Particulate Matters (Size less than 10µm) are used to estimate the Mercury, lead, Nickel and Arsenic levels. Filter paper is digested and analyzed for heavy metal as per the method “As per IS 5182 (Part 22): 2004 followed by Atomic Absorption Spectrometer (AAS), Benzene and Benzo(a) Pyrene (BaP) as per method IS 5182 followed by Gas Chromatography (GC&HPLC).

TABLE 3.9 AMBIENT AIR QUALITY DATA

Period: Dec-2021 –Feb-2022

Location: AAQ1- Core Zone

Sampling Time: 24-hourly

Monitoring		Gaseous Pollutants, µg/m ³										Other Pollutants (Particulate Phase)				
Date	Period, hrs.	SPM (24 hrs.)	PM _{2.5} 60(24 hrs.)	PM ₁₀ (24 hrs.)	SO ₂ (24 hrs.)	NO ₂ (24 hrs.)	NO _x (24 hrs.)	NH ₃ (24 hrs.)	O ₃ (8-hly Avg.) (8 hrs.)	CO (8-hly Avg.) (8hrs.)	Pb, µg/m ³ (24 hrs.)	As, ng/m ³ (annual)	Ni, ng/m ³ (annual)	CoH ₆ , ng/m ³ (annual)	BaP, ng/m ³ (annual)	
NAAQ Norms*																
01.12.2021	07.00-07.00	61.3	22.5	44.1	8.3	20.9	<5	<5	<1.0	<0.01	<5	<3	<1.0	<3.0		
02.12.2021	07.15-07.15	62.2	26.4	46.3	8.1	21.2	<5	<5	<1.0	<0.01	<5	<3	<1.0	<3.0		
08.12.2021	07.00-07.00	61.3	25.3	42.1	8.3	22.9	<5	<5	<1.0	<0.01	<5	<3	<1.0	<3.0		
09.12.2021	07.15-07.15	60.4	23.2	41.6	8.4	21.2	<5	<5	<1.0	<0.01	<5	<3	<1.0	<3.0		
15.12.2021	07.00-07.00	61.9	26.7	42.3	8.3	21.4	<5	<5	<1.0	<0.01	<5	<3	<1.0	<3.0		
16.12.2021	07.15-07.15	62.5	23.9	42.7	7.9	22.2	<5	<5	<1.0	<0.01	<5	<3	<1.0	<3.0		
22.12.2021	07.00-07.00	61.7	24.5	44.3	8.5	20.3	<5	<5	<1.0	<0.01	<5	<3	<1.0	<3.0		
23.12.2021	07.15-07.15	61.3	25.4	44.8	7.5	22.5	<5	<5	<1.0	<0.01	<5	<3	<1.0	<3.0		
29.12.2021	07.00-07.00	60.2	26.8	42.2	7.6	22.2	<5	<5	<1.0	<0.01	<5	<3	<1.0	<3.0		
30.12.2021	07.15-07.15	61.8	23.9	42.3	8.2	21.9	<5	<5	<1.0	<0.01	<5	<3	<1.0	<3.0		
05.01.2022	07.00-07.00	60.5	26.4	41.6	8.4	21.2	<5	<5	<1.0	<0.01	<5	<3	<1.0	<3.0		
06.01.2022	07.15-07.15	61.3	24.4	43.7	8.6	21.6	<5	<5	<1.0	<0.01	<5	<3	<1.0	<3.0		
12.01.2022	07.00-07.00	62.8	26.5	42.7	8.7	21.4	<5	<5	<1.0	<0.01	<5	<3	<1.0	<3.0		
13.01.2022	07.15-07.15	62.3	26.7	44.9	8.9	22.5	<5	<5	<1.0	<0.01	<5	<3	<1.0	<3.0		
19.01.2022	07.00-07.00	61.7	23.6	42.7	7.3	22.3	<5	<5	<1.0	<0.01	<5	<3	<1.0	<3.0		
20.01.2022	07.15-07.15	61.6	25.5	42.8	7.5	22.3	<5	<5	<1.0	<0.01	<5	<3	<1.0	<3.0		
26.01.2022	07.00-07.00	61.3	26.7	41.4	7.6	21.1	<5	<5	<1.0	<0.01	<5	<3	<1.0	<3.0		
27.01.2022	07.15-07.15	62.1	26.7	42.8	7.4	21.7	<5	<5	<1.0	<0.01	<5	<3	<1.0	<3.0		
02.02.2022	07.00-07.00	60.3	25.4	42.9	7.8	22.4	<5	<5	<1.0	<0.01	<5	<3	<1.0	<3.0		
03.02.2022	07.15-07.15	60.4	25.8	41.5	7.6	21.2	<5	<5	<1.0	<0.01	<5	<3	<1.0	<3.0		
09.02.2022	07.00-07.00	62.9	26.9	42.7	7.1	21.9	<5	<5	<1.0	<0.01	<5	<3	<1.0	<3.0		
10.02.2022	07.15-07.15	60.7	26.3	42.5	7.8	22.7	<5	<5	<1.0	<0.01	<5	<3	<1.0	<3.0		
16.02.2022	07.00-07.00	60.3	25.7	41.3	7.6	23.4	<5	<5	<1.0	<0.01	<5	<3	<1.0	<3.0		
17.02.2022	07.15-07.15	60.6	24.1	42.9	7.9	22.8	<5	<5	<1.0	<0.01	<5	<3	<1.0	<3.0		
23.02.2022	07.00-07.00	59.3	24.7	43.7	8.3	22.7	<5	<5	<1.0	<0.01	<5	<3	<1.0	<3.0		
24.02.2022	07.15-07.15	62.5	24.0	44.4	8.4	21.4	<5	<5	<1.0	<0.01	<5	<3	<1.0	<3.0		

Legend: **PM_{2.5}**-Particulate Matter size less than 2.5 µm; **PM₁₀**-Respirable Particulate Matter size less than 10 µm; **SO₂**-Sulphur dioxide; **NO_x**-Oxides of Nitrogen; **NH₃**-Ammonia; **O₃**-Ozone;

CO-Carbon monoxide; **Pb**-Particulate Lead; **As**-Particulate Arsenic; **Ni**-Particulate Nickel; **C₆H₆**-Benzene & **BaP**- Benzo (a) pyrene in particulate phase.

* **NAAQ Norms**-National Ambient Air Quality Norms-**Revised as per GSR 826(E) Dated: 16.11.2009** for Industrial, Residential, Rural and other Areas.

TABLE 3.10 AMBIENT AIR QUALITY DATA

Monitoring		Location: AAQ2- Core Zone						Sampling Time: 24-hourly						
Date	Period, hrs.	SPM (24 hrs.)	PM2.5 60(24 hrs.)	PM10 (24 hrs.)	SO ₂ (24 hrs.)	NO ₂ (24 hrs.)	NH ₃ (24 hrs.)	O ₃ (8-hly Avg.) (8 hrs.)	CO (8-hly Avg.) (8 hrs.)	Pb, µg/m ³ (24 hrs.)	As, ng/m ³ (annual)	Ni, ng/m ³ (annual)	C ₆ H ₆ , ng/m ³ (annual)	BaP, ng/m ³ (annual)
NAAQ Norms*														
01.12.2021	07.15-07.15	56.3	23.7	45.7	6.9	23.5	<5	<5	<1.0	<0.01	<5	<3	<1.0	<3.0
02.12.2021	07.30-07:30	58.2	24.6	45.3	6.5	22.9	<5	<5	<1.0	<0.01	<5	<3	<1.0	<3.0
08.12.2021	07.15-07.15	56.6	25.3	42.7	6.9	21.7	<5	<5	<1.0	<0.01	<5	<3	<1.0	<3.0
09.12.2021	07.30-07:30	58.7	21.8	41.4	7.3	25.4	<5	<5	<1.0	<0.01	<5	<3	<1.0	<3.0
15.12.2021	07.15-07.15	57.8	23.6	47.6	7.8	25.6	<5	<5	<1.0	<0.01	<5	<3	<1.0	<3.0
16.12.2021	07.30-07:30	53.6	22.5	45.3	7.5	22.9	<5	<5	<1.0	<0.01	<5	<3	<1.0	<3.0
22.12.2021	07.15-07.15	50.1	23.4	44.6	7.8	21.8	<5	<5	<1.0	<0.01	<5	<3	<1.0	<3.0
23.12.2021	07.30-07:30	56.5	24.9	44.5	7.4	23.4	<5	<5	<1.0	<0.01	<5	<3	<1.0	<3.0
29.12.2021	07.15-07.15	53.3	23.6	43.9	7.6	21.6	<5	<5	<1.0	<0.01	<5	<3	<1.0	<3.0
30.12.2021	07.30-07:30	53.3	25.5	43.6	7.3	23.9	<5	<5	<1.0	<0.01	<5	<3	<1.0	<3.0
05.01.2022	07.15-07.15	53.7	24.6	46.9	7.8	21.5	<5	<5	<1.0	<0.01	<5	<3	<1.0	<3.0
06.01.2022	07.30-07:30	54.6	25.3	45.6	8.6	23.6	<5	<5	<1.0	<0.01	<5	<3	<1.0	<3.0
12.01.2022	07.15-07.15	54.5	25.9	42.8	8.1	24.5	<5	<5	<1.0	<0.01	<5	<3	<1.0	<3.0
13.01.2022	07.15-07.15	54.8	23.3	44.4	8.6	22.9	<5	<5	<1.0	<0.01	<5	<3	<1.0	<3.0
19.01.2022	07.00-07.00	55.6	21.4	44.6	6.7	21.5	<5	<5	<1.0	<0.01	<5	<3	<1.0	<3.0
20.01.2022	07.15-07.15	56.7	23.7	45.2	7.2	23.7	<5	<5	<1.0	<0.01	<5	<3	<1.0	<3.0
26.01.2022	07.00-07.00	56.5	23.6	47.4	7.3	25.5	<5	<5	<1.0	<0.01	<5	<3	<1.0	<3.0
27.01.2022	07.15-07.15	55.6	22.4	43.4	7.5	21.8	<5	<5	<1.0	<0.01	<5	<3	<1.0	<3.0
02.02.2022	07.00-07.00	55.3	25.8	46.5	7.1	25.1	<5	<5	<1.0	<0.01	<5	<3	<1.0	<3.0
03.02.2022	07.15-07.15	54.3	24.4	44.7	7.8	24.7	<5	<5	<1.0	<0.01	<5	<3	<1.0	<3.0
09.02.2022	07.00-07.00	56.7	23.7	42.3	6.5	23.3	<5	<5	<1.0	<0.01	<5	<3	<1.0	<3.0
10.02.2022	07.15-07.15	56.3	24.9	43.6	6.8	22.8	<5	<5	<1.0	<0.01	<5	<3	<1.0	<3.0
16.02.2022	07.00-07.00	54.4	23.7	42.9	6.4	23.5	<5	<5	<1.0	<0.01	<5	<3	<1.0	<3.0
17.02.2022	07.15-07.15	54.6	24.3	43.9	6.7	24.4	<5	<5	<1.0	<0.01	<5	<3	<1.0	<3.0
23.02.2022	07.00-07.00	54.3	23.4	44.7	6.8	25.3	<5	<5	<1.0	<0.01	<5	<3	<1.0	<3.0
24.02.2022	07.15-07.15	55.2	24.3	44.4	6.1	23.7	<5	<5	<1.0	<0.01	<5	<3	<1.0	<3.0

TABLE 3.11 AMBIENT AIR QUALITY DATA

Monitoring		Particulates, µg/m ³					Gaseous Pollutants, µg/m ³					Other Pollutants (Particulate Phase), µg/m ³				
Date	Period, hrs.	SPM (24 hrs.)	PM2.5 (24 hrs.)	PM10 (24 hrs.)	SO ₂ (24 hrs.)	NO ₂ (24 hrs.)	NH ₃ (24 hrs.)	O ₃ (8-hly Avg.)	CO (8-hly Avg.)	Pb, µg/m ³ (24 hrs.)	As, ng/m ³ (annual)	Ni, ng/m ³ (annual)	C ₆ H ₆ , ng/m ³ (annual)	BaP, ng/m ³ (annual)		
NAAQ Norms*			60 (24 hrs.)	100 (24 hrs.)	80 (24 hrs.)	400 (24 hrs.)	100 (8 hrs.)	2.0 (8hrs.)	1.0 (24 hrs.)	6.0 (annual)	20 (annual)	5.0 (annual)	1.0 (annual)			
01.12.2021	07.15-07.15	47.6	19.6	39.3	7.9	23.8	<5	<5	<0.01	<5	<3	<1.0	<3.0			
02.12.2021	07.30-07.30	46.2	19.2	38.3	7.8	23.6	<5	<5	<0.01	<5	<3	<1.0	<3.0			
08.12.2021	07.15-07.15	46.3	19.4	39.3	7.8	23.5	<5	<5	<0.01	<5	<3	<1.0	<3.0			
09.12.2021	07.30-07.30	46.7	18.2	39.4	7.2	23.4	<5	<5	<0.01	<5	<3	<1.0	<3.0			
15.12.2021	07.15-07.15	45.5	18.6	40.2	7.6	24.3	<5	<5	<0.01	<5	<3	<1.0	<3.0			
16.12.2021	07.30-07.30	45.2	18.2	41.2	6.9	24.9	<5	<5	<0.01	<5	<3	<1.0	<3.0			
22.12.2021	07.15-07.15	45.3	19.3	40.3	6.7	24.6	<5	<5	<0.01	<5	<3	<1.0	<3.0			
23.12.2021	07.30-07.30	46.8	19.6	38.2	6.8	24.7	<5	<5	<0.01	<5	<3	<1.0	<3.0			
29.12.2021	07.15-07.15	46.9	19.5	38.5	8.3	24.2	<5	<5	<0.01	<5	<3	<1.0	<3.0			
30.12.2021	07.30-07.30	46.2	19.5	39.7	8.6	24.5	<5	<5	<0.01	<5	<3	<1.0	<3.0			
05.01.2022	07.15-07.15	47.3	19.3	39.6	8.9	23.1	<5	<5	<0.01	<5	<3	<1.0	<3.0			
06.01.2022	07.30-07.30	47.9	19.5	39.2	8.4	23.5	<5	<5	<0.01	<5	<3	<1.0	<3.0			
12.01.2022	07.15-07.15	47.5	19.2	37.6	8.2	23.8	<5	<5	<0.01	<5	<3	<1.0	<3.0			
13.01.2022	07.15-07.15	47.8	19.8	37.5	8.6	23.9	<5	<5	<0.01	<5	<3	<1.0	<3.0			
19.01.2022	07.00-07.00	46.9	19.3	37.3	8.4	24.1	<5	<5	<0.01	<5	<3	<1.0	<3.0			
20.01.2022	07.15-07.15	46.3	20.2	40.2	7.6	24.5	<5	<5	<0.01	<5	<3	<1.0	<3.0			
26.01.2022	07.00-07.00	46.8	20.3	40.6	7.4	24.7	<5	<5	<0.01	<5	<3	<1.0	<3.0			
27.01.2022	07.15-07.15	46.2	20.4	40.9	7.7	24.8	<5	<5	<0.01	<5	<3	<1.0	<3.0			
02.02.2022	07.00-07.00	46.3	20.5	41.3	7.9	23.2	<5	<5	<0.01	<5	<3	<1.0	<3.0			
03.02.2022	07.15-07.15	46.9	20.6	41.7	8.3	23.5	<5	<5	<0.01	<5	<3	<1.0	<3.0			
09.02.2022	07.00-07.00	48.2	20.7	39.2	7.3	23.1	<5	<5	<0.01	<5	<3	<1.0	<3.0			
10.02.2022	07.15-07.15	48.3	18.3	38.8	7.2	23.8	<5	<5	<0.01	<5	<3	<1.0	<3.0			
16.02.2022	07.00-07.00	48.7	20.3	38.7	7.2	24.1	<5	<5	<0.01	<5	<3	<1.0	<3.0			
17.02.2022	07.15-07.15	47.3	20.1	41.3	7.8	24.8	<5	<5	<0.01	<5	<3	<1.0	<3.0			
23.02.2022	07.00-07.00	47.5	20.6	41.5	6.8	25.1	<5	<5	<0.01	<5	<3	<1.0	<3.0			
24.02.2022	07.15-07.15	47.9	20.8	41.6	6.4	25.4	<5	<5	<0.01	<5	<3	<1.0	<3.0			

TABLE 3.12 AMBIENT AIR QUALITY DATA LOCATION

Monitoring		Location: AAQ4 – Mamarathupatti										Sampling Time: 24-hourly		
Date	Period, hrs.	SPM (24 hrs.)	PM2.5 60(24 hrs.)	PM10 (24 hrs.)	SO ₂ (24 hrs.)	NO ₂ (24 hrs.)	NH ₃ (24 hrs.)	O ₃ (8-hly Avg.)	CO (8-hly Avg.)	Pb, µg/m ³ (24 hrs.)	As, ng/m ³ (annual)	Ni, ng/m ³ (annual)	C ₆ H ₆ , ng/m ³ (annual)	BaP, ng/m ³ (annual)
NAAQ Norms*		100 (24 hrs.)	60(24 hrs.)	100 (24 hrs.)	80 (24 hrs.)	80 (24 hrs.)	400 (24 hrs.)	100 (8 hrs.)	2.0 (8hrs.)	1.0 (24 hrs.)	6.0 (annual)	20 (annual)	5.0 (annual)	1.0 (annual)
01.12.2021	07.00-07.00	49.5	21.2	42.2	6.9	22.3	<5	<5	<1.0	<0.01	<5	<3	<1.0	<3.0
02.12.2021	07.15-07.15	49.6	22.3	41.5	6.7	22.5	<5	<5	<1.0	<0.01	<5	<3	<1.0	<3.0
08.12.2021	07.00-07.00	47.2	21.6	42.9	6.6	21.6	<5	<5	<1.0	<0.01	<5	<3	<1.0	<3.0
09.12.2021	07.15-07.15	49.3	21.6	43.7	6.4	21.7	<5	<5	<1.0	<0.01	<5	<3	<1.0	<3.0
15.12.2021	07.00-07.00	49.6	22.4	41.5	7.3	22.5	<5	<5	<1.0	<0.01	<5	<3	<1.0	<3.0
16.12.2021	07.15-07.15	47.5	22.5	44.6	7.5	21.6	<5	<5	<1.0	<0.01	<5	<3	<1.0	<3.0
22.12.2021	07.00-07.00	48.8	21.3	42.2	7.1	21.8	<5	<5	<1.0	<0.01	<5	<3	<1.0	<3.0
23.12.2021	07.15-07.15	48.3	21.3	44.3	7.5	22.5	<5	<5	<1.0	<0.01	<5	<3	<1.0	<3.0
29.12.2021	07.00-07.00	47.2	21.8	44.5	4.1	21.6	<5	<5	<1.0	<0.01	<5	<3	<1.0	<3.0
30.12.2021	07.15-07.15	47.9	19.6	43.3	5.4	22.5	<5	<5	<1.0	<0.01	<5	<3	<1.0	<3.0
05.01.2022	07.00-07.00	47.5	19.9	44.5	7.8	23.6	<5	<5	<1.0	<0.01	<5	<3	<1.0	<3.0
06.01.2022	07.15-07.15	48.8	21.6	45.6	7.9	22.7	<5	<5	<1.0	<0.01	<5	<3	<1.0	<3.0
12.01.2022	07.00-07.00	48.3	19.4	41.9	6.4	22.6	<5	<5	<1.0	<0.01	<5	<3	<1.0	<3.0
13.01.2022	07.15-07.15	47.9	19.2	43.7	6.9	22.4	<5	<5	<1.0	<0.01	<5	<3	<1.0	<3.0
19.01.2022	07.00-07.00	48.6	20.3	41.6	6.7	21.3	<5	<5	<1.0	<0.01	<5	<3	<1.0	<3.0
20.01.2022	07.15-07.15	49.2	21.3	42.3	6.8	24.5	<5	<5	<1.0	<0.01	<5	<3	<1.0	<3.0
26.01.2022	07.00-07.00	49.7	19.6	42.3	6.1	24.6	<5	<5	<1.0	<0.01	<5	<3	<1.0	<3.0
27.01.2022	07.15-07.15	49.5	19.2	45.8	6.4	24.3	<5	<5	<1.0	<0.01	<5	<3	<1.0	<3.0
02.02.2022	07.00-07.00	49.3	18.4	41.7	7.3	21.4	<5	<5	<1.0	<0.01	<5	<3	<1.0	<3.0
03.02.2022	07.15-07.15	49.4	20.3	42.6	7.3	23.6	<5	<5	<1.0	<0.01	<5	<3	<1.0	<3.0
09.02.2022	07.00-07.00	48.3	21.4	42.2	7.6	23.9	<5	<5	<1.0	<0.01	<5	<3	<1.0	<3.0
10.02.2022	07.15-07.15	48.7	21.6	40.3	7.1	23.6	<5	<5	<1.0	<0.01	<5	<3	<1.0	<3.0
16.02.2022	07.00-07.00	49.3	21.5	42.9	7.4	22.1	<5	<5	<1.0	<0.01	<5	<3	<1.0	<3.0
17.02.2022	07.15-07.15	49.5	21.3	40.7	7.2	22.1	<5	<5	<1.0	<0.01	<5	<3	<1.0	<3.0
23.02.2022	07.00-07.00	49.7	21.5	43.9	7.5	22.6	<5	<5	<1.0	<0.01	<5	<3	<1.0	<3.0
24.02.2022	07.15-07.15	48.3	21.9	41.5	7.8	23.9	<5	<5	<1.0	<0.01	<5	<3	<1.0	<3.0

TABLE 3.13 AMBIENT AIR QUALITY DATA LOCATION

Period: Dec-2021 –Feb-2022
 Location: AAQ5- Budwadi
 Sampling Time: 24-hourly

Monitoring		Particulates, µg/m ³				Gaseous Pollutants, µg/m ³				Other Pollutants (Particulate Phase), µg/m ³					
Date	Period, hrs.	SPM (24 hrs.)	PM2.5 60(24 hrs.)	PM10 (24 hrs.)	SO ₂ (24 hrs.)	NO ₂ (24 hrs.)	NH ₃ (24 hrs.)	O ₃ (8-hly Avg.)	CO (8-hly Avg.)	Pb, µg/m ³ (24 hrs.)	As, ng/m ³ (annual)	Ni, ng/m ³ (annual)	C ₆ H ₆ , ng/m ³ (annual)	BaP, ng/m ³ (annual)	
NAAQ Norms*		(24 hrs.)	60(24 hrs.)	100 (24 hrs.)	80 (24 hrs.)	80 (24 hrs.)	400 (24 hrs.)	100 (8 hrs.)	2.0 (8hrs.)	1.0 (24 hrs.)	6.0 (annual)	20 (annual)	5.0 (annual)	1.0 (annual)	
01.12.2021	07:30-07:30	54.1	19.2	39.5	6.3	22.3	<5	<5	<1.0	<0.01	<5	<3	<1.0	<3.0	
02.12.2021	07:45-07:45	52.5	19.4	38.9	6.7	22.3	<5	<5	<1.0	<0.01	<5	<3	<1.0	<3.0	
08.12.2021	07:30-07:30	52.2	19.6	39.1	6.9	22.5	<5	<5	<1.0	<0.01	<5	<3	<1.0	<3.0	
09.12.2021	07:45-07:45	51.2	19.7	38.6	7.1	22.1	<5	<5	<1.0	<0.01	<5	<3	<1.0	<3.0	
15.12.2021	07:30-07:30	52.3	18.2	39.6	7.5	21.5	<5	<5	<1.0	<0.01	<5	<3	<1.0	<3.0	
16.12.2021	07:45-07:45	51.9	18.6	38.3	6.4	21.6	<5	<5	<1.0	<0.01	<5	<3	<1.0	<3.0	
22.12.2021	07:30-07:30	52.5	19.2	38.2	6.5	22.7	<5	<5	<1.0	<0.01	<5	<3	<1.0	<3.0	
23.12.2021	07:45-07:45	52.3	19.7	39.1	6.4	22.5	<5	<5	<1.0	<0.01	<5	<3	<1.0	<3.0	
29.12.2021	07:30-07:30	54.4	19.6	39.8	5.5	21.6	<5	<5	<1.0	<0.01	<5	<3	<1.0	<3.0	
30.12.2021	07:45-07:45	51.9	19.9	38.5	5.7	20.9	<5	<5	<1.0	<0.01	<5	<3	<1.0	<3.0	
05.01.2022	07:30-07:30	52.7	18.5	39.7	5.6	21.4	<5	<5	<1.0	<0.01	<5	<3	<1.0	<3.0	
06.01.2022	07:45-07:45	52.3	18.8	41.2	5.8	21.8	<5	<5	<1.0	<0.01	<5	<3	<1.0	<3.0	
12.01.2022	07:30-07:30	52.4	19.9	40.6	5.6	21.9	<5	<5	<1.0	<0.01	<5	<3	<1.0	<3.0	
13.01.2022	07:15-07:15	54.8	19.7	39.2	5.9	20.2	<5	<5	<1.0	<0.01	<5	<3	<1.0	<3.0	
19.01.2022	07:00-07:00	54.4	19.9	39.8	5.5	20.5	<5	<5	<1.0	<0.01	<5	<3	<1.0	<3.0	
20.01.2022	07:15-07:15	52.8	19.2	41.8	5.6	20.7	<5	<5	<1.0	<0.01	<5	<3	<1.0	<3.0	
26.01.2022	07:00-07:00	53.8	19.6	41.3	5.9	20.6	<5	<5	<1.0	<0.01	<5	<3	<1.0	<3.0	
27.01.2022	07:15-07:15	54.8	19.6	39.5	5.7	20.9	<5	<5	<1.0	<0.01	<5	<3	<1.0	<3.0	
02.02.2022	07:00-07:00	51.2	19.2	38.9	6.6	21.4	<5	<5	<1.0	<0.01	<5	<3	<1.0	<3.0	
03.02.2022	07:15-07:15	52.9	18.9	37.1	6.8	21.4	<5	<5	<1.0	<0.01	<5	<3	<1.0	<3.0	
09.02.2022	07:00-07:00	50.2	19.7	39.5	6.9	20.5	<5	<5	<1.0	<0.01	<5	<3	<1.0	<3.0	
10.02.2022	07:15-07:15	50.3	19.5	40.1	6.8	20.1	<5	<5	<1.0	<0.01	<5	<3	<1.0	<3.0	
16.02.2022	07:00-07:00	50.8	19.5	41.5	7.6	21.3	<5	<5	<1.0	<0.01	<5	<3	<1.0	<3.0	
17.02.2022	07:15-07:15	50.7	19.6	42.7	7.1	20.2	<5	<5	<1.0	<0.01	<5	<3	<1.0	<3.0	
23.02.2022	07:00-07:00	50.2	20.6	42.6	7.5	21.7	<5	<5	<1.0	<0.01	<5	<3	<1.0	<3.0	
24.02.2022	07:15-07:15	52.9	19.6	42.7	7.8	21.5	<5	<5	<1.0	<0.01	<5	<3	<1.0	<3.0	

TABLE 3.14 AMBIENT AIR QUALITY DATA LOCATION

Monitoring		Location: AAQ6 – Chinnatampatti										Sampling Time: 24-hourly				
Date	Period, hrs.	SPM (24 hrs.)	Particulates, µg/m ³		Gaseous Pollutants, µg/m ³					Other Pollutants (Particulate Phase), µg/m ³						
NAAQ Norms*		PM2.5 60(24 hrs.)	PM10 (24 hrs.)	SO ₂ (24 hrs.)	NO ₂ (24 hrs.)	NH ₃ (24 hrs.)	O ₃ (8-hly Avg.)	CO (8-hly Avg.)	Pb, µg/m ³ (24 hrs.)	As, ng/m ³ (annual)	Ni, ng/m ³ (annual)	C ₆ H ₆ , ng/m ³ (annual)	BaP, ng/m ³ (annual)			
01.12.2021	08:00-08:00	54.6	19.8	39.5	80 (24 hrs.)	400 (24 hrs.)	100 (8 hrs.)	2.0 (8hrs.)	1.0 (24 hrs.)	6.0 (annual)	20 (annual)	5.0 (annual)	1.0 (annual)			
02.12.2021	08:15-08:15	54.3	19.6	39.4	6.8	21.0	<5	<1.0	<0.01	<5	<3	<1.0	<3.0			
08.12.2021	08:00-08:00	52.2	18.2	39.1	6.6	21.0	<5	<1.0	<0.01	<5	<3	<1.0	<3.0			
09.12.2021	08:15-08:15	51.8	19.5	38.5	6.9	20.3	<5	<1.0	<0.01	<5	<3	<1.0	<3.0			
15.12.2021	08:00-08:00	52.4	19.4	38.2	6.4	20.7	<5	<1.0	<0.01	<5	<3	<1.0	<3.0			
16.12.2021	08:15-08:15	52.3	19.1	36.9	6.6	20.5	<5	<1.0	<0.01	<5	<3	<1.0	<3.0			
22.12.2021	08:00-08:00	52.9	18.2	36.4	6.8	21.4	<5	<1.0	<0.01	<5	<3	<1.0	<3.0			
23.12.2021	08:15-08:15	52.2	18.7	35.8	6.5	21.3	<5	<1.0	<0.01	<5	<3	<1.0	<3.0			
29.12.2021	08:00-08:00	52.4	19.6	36.9	6.1	21.9	<5	<1.0	<0.01	<5	<3	<1.0	<3.0			
30.12.2021	08:15-08:15	54.6	18.9	36.8	6.7	21.7	<5	<1.0	<0.01	<5	<3	<1.0	<3.0			
05.01.2022	08:00-08:00	54.3	20.1	38.1	6.5	21.4	<5	<1.0	<0.01	<5	<3	<1.0	<3.0			
06.01.2022	08:15-08:15	52.8	19.6	38.5	6.8	20.3	<5	<1.0	<0.01	<5	<3	<1.0	<3.0			
12.01.2022	08:00-08:00	51.6	18.2	38.0	6.4	20.3	<5	<1.0	<0.01	<5	<3	<1.0	<3.0			
13.01.2022	07:15-07:15	52.5	19.7	36.9	6.8	20.9	<5	<1.0	<0.01	<5	<3	<1.0	<3.0			
19.01.2022	07:00-07:00	52.4	19.4	36.7	6.6	20.6	<5	<1.0	<0.01	<5	<3	<1.0	<3.0			
20.01.2022	07:15-07:15	52.3	19.3	35.5	6.1	20.1	<5	<1.0	<0.01	<5	<3	<1.0	<3.0			
26.01.2022	07:00-07:00	54.2	18.0	38.1	6.5	21.9	<5	<1.0	<0.01	<5	<3	<1.0	<3.0			
27.01.2022	07:15-07:15	54.3	19.4	38.9	6.4	21.7	<5	<1.0	<0.01	<5	<3	<1.0	<3.0			
02.02.2022	07:00-07:00	55.7	19.6	37.2	6.8	21.6	<5	<1.0	<0.01	<5	<3	<1.0	<3.0			
03.02.2022	07:15-07:15	52.5	19.2	37.4	6.7	21.5	<5	<1.0	<0.01	<5	<3	<1.0	<3.0			
09.02.2022	07:00-07:00	52.8	19.3	38.2	6.2	20.9	<5	<1.0	<0.01	<5	<3	<1.0	<3.0			
10.02.2022	07:15-07:15	53.3	20.1	38.5	5.4	22.5	<5	<1.0	<0.01	<5	<3	<1.0	<3.0			
16.02.2022	07:00-07:00	56.3	20.5	36.7	6.8	21.4	<5	<1.0	<0.01	<5	<3	<1.0	<3.0			
17.02.2022	07:15-07:15	52.2	20.2	37.4	6.3	21.4	<5	<1.0	<0.01	<5	<3	<1.0	<3.0			
23.02.2022	07:00-07:00	53.1	20.6	38.5	6.7	21.7	<5	<1.0	<0.01	<5	<3	<1.0	<3.0			
24.02.2022	07:15-07:15	52.7	21.9	36.8	6.1	21.6	<5	<1.0	<0.01	<5	<3	<1.0	<3.0			

TABLE 3.15 AMBIENT AIR QUALITY DATA LOCATION

Monitoring		Location: AAQ7- Mathagiri										Sampling Time: 24-hourly				
Date	Period, hrs.	SPM (24 hrs.)	Particulates, $\mu\text{g}/\text{m}^3$		Gaseous Pollutants, $\mu\text{g}/\text{m}^3$					Other Pollutants (Particulate Phase), $\mu\text{g}/\text{m}^3$						
			PM2.5 60(24 hrs.)	PM10 (24 hrs.)	SO ₂	NO ₂	NH ₃	O ₃ (8-hly Avg.)	CO (8-hly Avg.)	Pb, $\mu\text{g}/\text{m}^3$ (24 hrs.)	As, ng/m^3 (annual)	Ni, ng/m^3 (annual)	C ₆ H ₆ , ng/m^3 (annual)	BaP, ng/m^3 (annual)		
01.12.2021	08:00-08:00	48.4	19.6	38.2	7.6	20.3	<5	<5	<1.0	<0.01	<5	<3	<1.0	<3.0		
02.12.2021	08:15-08:15	48.6	19.5	38.6	7.6	20.5	<5	<5	<1.0	<0.01	<5	<3	<1.0	<3.0		
08.12.2021	08:00-08:00	48.5	19.3	39.2	7.2	21.6	<5	<5	<1.0	<0.01	<5	<3	<1.0	<3.0		
09.12.2021	08:15-08:15	47.3	19.4	39.1	6.2	21.7	<5	<5	<1.0	<0.01	<5	<3	<1.0	<3.0		
15.12.2021	08:00-08:00	45.5	19.8	35.6	6.5	21.6	<5	<5	<1.0	<0.01	<5	<3	<1.0	<3.0		
16.12.2021	08:15-08:15	45.6	19.6	35.3	6.9	21.8	<5	<5	<1.0	<0.01	<5	<3	<1.0	<3.0		
22.12.2021	08:00-08:00	48.1	19.5	36.2	6.7	21.6	<5	<5	<1.0	<0.01	<5	<3	<1.0	<3.0		
23.12.2021	08:15-08:15	45.5	20.9	36.2	6.8	22.5	<5	<5	<1.0	<0.01	<5	<3	<1.0	<3.0		
29.12.2021	08:00-08:00	45.6	19.4	38.2	6.2	22.6	<5	<5	<1.0	<0.01	<5	<3	<1.0	<3.0		
30.12.2021	08:15-08:15	46.6	18.2	38.8	6.2	22.4	<5	<5	<1.0	<0.01	<5	<3	<1.0	<3.0		
05.01.2022	08:00-08:00	46.3	18.6	35.4	6.3	22.7	<5	<5	<1.0	<0.01	<5	<3	<1.0	<3.0		
06.01.2022	08:15-08:15	46.2	18.2	38.2	7.4	24.6	<5	<5	<1.0	<0.01	<5	<3	<1.0	<3.0		
12.01.2022	08:00-08:00	46.4	18.2	38.1	5.5	24.5	<5	<5	<1.0	<0.01	<5	<3	<1.0	<3.0		
13.01.2022	07:15-07:15	45.2	17.8	37.2	5.7	24.3	<5	<5	<1.0	<0.01	<5	<3	<1.0	<3.0		
19.01.2022	07:00-07:00	45.3	17.7	37.6	4.6	24.1	<5	<5	<1.0	<0.01	<5	<3	<1.0	<3.0		
20.01.2022	07:15-07:15	45.7	18.8	34.8	4.9	23.2	<5	<5	<1.0	<0.01	<5	<3	<1.0	<3.0		
26.01.2022	07:00-07:00	43.5	17.6	35.2	4.2	23.5	<5	<5	<1.0	<0.01	<5	<3	<1.0	<3.0		
27.01.2022	07:15-07:15	43.9	17.2	35.8	7.6	23.1	<5	<5	<1.0	<0.01	<5	<3	<1.0	<3.0		
02.02.2022	07:00-07:00	45.6	17.5	35.4	7.9	26.2	<5	<5	<1.0	<0.01	<5	<3	<1.0	<3.0		
03.02.2022	07:15-07:15	47.6	17.8	36.3	8.2	26.1	<5	<5	<1.0	<0.01	<5	<3	<1.0	<3.0		
09.02.2022	07:00-07:00	47.5	18.3	36.2	8.6	26.4	<5	<5	<1.0	<0.01	<5	<3	<1.0	<3.0		
10.02.2022	07:15-07:15	48.4	18.6	36.1	8.1	25.2	<5	<5	<1.0	<0.01	<5	<3	<1.0	<3.0		
16.02.2022	07:00-07:00	48.3	18.2	37.1	8.6	24.1	<5	<5	<1.0	<0.01	<5	<3	<1.0	<3.0		
17.02.2022	07:15-07:15	48.5	18.5	38.5	8.2	25.9	<5	<5	<1.0	<0.01	<5	<3	<1.0	<3.0		
23.02.2022	07:00-07:00	48.9	18.1	37.6	6.3	23.1	<5	<5	<1.0	<0.01	<5	<3	<1.0	<3.0		
24.02.2022	07:15-07:15	49.4	18.7	38.5	6.8	24.4	<5	<5	<1.0	<0.01	<5	<3	<1.0	<3.0		

TABLE 3.16 AMBIENT AIR QUALITY DATA LOCATION

Location: AAQ8- Mylampatti

Sampling Time: 24-hourly

Period: Dec-2021 –Feb-2022

Monitoring		Particulates, µg/m ³				Gaseous Pollutants, µg/m ³					Other Pollutants (Particulate Phase), µg/m ³				
Date	Period, hrs.	SPM (24 hrs.)	PM2.5 60(24 hrs.)	PM10 (24 hrs.)	SO ₂ (24 hrs.)	NO ₂ (24 hrs.)	NH ₃	O ₃ (8-hly Avg.)	CO (8-hly Avg.)	Pb, µg/m ³ (24 hrs.)	As, ng/m ³ (annual)	Ni, ng/m ³ (annual)	C ₆ H ₆ , ng/m ³ (annual)	BaP, ng/m ³ (annual)	
NAAQ Norms*		(24 hrs.)	60(24 hrs.)	100 (24 hrs.)	80 (24 hrs.)	400 (24 hrs.)	100 (8 hrs.)	2.0 (8hrs.)	1.0 (24 hrs.)	6.0 (annual)	20 (annual)	5.0 (annual)	1.0 (annual)		
01.12.2021	08:00-08:00	44.2	19.9	38.7	6.2	26.2	<5	<5	<1.0	<0.01	<5	<3	<1.0	<3.0	
02.12.2021	08:15-08:15	42.3	21.3	38.6	6.1	26.3	<5	<5	<1.0	<0.01	<5	<3	<1.0	<3.0	
08.12.2021	08:00-08:00	44.5	21.4	37.8	6.3	25.7	<5	<5	<1.0	<0.01	<5	<3	<1.0	<3.0	
09.12.2021	08:15-08:15	44.6	22.6	35.3	7.6	25.9	<5	<5	<1.0	<0.01	<5	<3	<1.0	<3.0	
15.12.2021	08:00-08:00	45.2	22.5	36.7	7.8	26.3	<5	<5	<1.0	<0.01	<5	<3	<1.0	<3.0	
16.12.2021	08:15-08:15	45.1	20.3	35.9	6.4	26.3	<5	<5	<1.0	<0.01	<5	<3	<1.0	<3.0	
22.12.2021	08:00-08:00	45.2	20.7	35.6	6.3	25.7	<5	<5	<1.0	<0.01	<5	<3	<1.0	<3.0	
23.12.2021	08:15-08:15	46.3	22.9	34.3	5.6	25.8	<5	<5	<1.0	<0.01	<5	<3	<1.0	<3.0	
29.12.2021	08:00-08:00	43.5	22.6	35.4	6.8	26.2	<5	<5	<1.0	<0.01	<5	<3	<1.0	<3.0	
30.12.2021	08:15-08:15	43.6	21.1	35.6	6.6	25.9	<5	<5	<1.0	<0.01	<5	<3	<1.0	<3.0	
05.01.2022	08:00-08:00	42.7	20.3	35.7	5.7	25.3	<5	<5	<1.0	<0.01	<5	<3	<1.0	<3.0	
06.01.2022	08:15-08:15	43.6	21.8	36.9	6.5	24.9	<5	<5	<1.0	<0.01	<5	<3	<1.0	<3.0	
12.01.2022	08:00-08:00	43.8	21.7	35.6	5.2	24.4	<5	<5	<1.0	<0.01	<5	<3	<1.0	<3.0	
13.01.2022	07:15-07:15	45.6	21.6	37.1	6.6	23.4	<5	<5	<1.0	<0.01	<5	<3	<1.0	<3.0	
19.01.2022	07:00-07:00	46.2	20.4	35.5	6.6	22.3	<5	<5	<1.0	<0.01	<5	<3	<1.0	<3.0	
20.01.2022	07:15-07:15	46.1	20.1	35.8	5.7	24.3	<5	<5	<1.0	<0.01	<5	<3	<1.0	<3.0	
26.01.2022	07:00-07:00	46.9	21.8	36.5	5.1	24.9	<5	<5	<1.0	<0.01	<5	<3	<1.0	<3.0	
27.01.2022	07:15-07:15	45.2	21.5	43.3	5.3	25.4	<5	<5	<1.0	<0.01	<5	<3	<1.0	<3.0	
02.02.2022	07:00-07:00	45.6	21.7	41.1	5.4	24.3	<5	<5	<1.0	<0.01	<5	<3	<1.0	<3.0	
03.02.2022	07:15-07:15	46.7	22.3	40.9	5.5	24.7	<5	<5	<1.0	<0.01	<5	<3	<1.0	<3.0	
09.02.2022	07:00-07:00	49.2	21.6	41.3	5.9	24.2	<5	<5	<1.0	<0.01	<5	<3	<1.0	<3.0	
10.02.2022	07:15-07:15	48.3	22.7	41.1	5.2	24.9	<5	<5	<1.0	<0.01	<5	<3	<1.0	<3.0	
16.02.2022	07:00-07:00	49.6	21.3	42.8	5.6	26.3	<5	<5	<1.0	<0.01	<5	<3	<1.0	<3.0	
17.02.2022	07:15-07:15	48.3	21.4	41.5	6.2	26.7	<5	<5	<1.0	<0.01	<5	<3	<1.0	<3.0	
23.02.2022	07:00-07:00	48.5	21.6	42.6	6.5	25.3	<5	<5	<1.0	<0.01	<5	<3	<1.0	<3.0	
24.02.2022	07:15-07:15	46.8	22.7	42.1	6.6	25.1	<5	<5	<1.0	<0.01	<5	<3	<1.0	<3.0	

TABLE 3.15: ABSTRACT OF AMBIENT AIR QUALITY DATA – AAQ1 & AAQ8

1	Parameter	SPM	PM2.5	PM10	SO ₂	NO ₂
2	No. of Observations	208	208	208	208	208
3	10 th Percentile Value	45.5	18.4	36.2	5.7	20.9
4	20 th Percentile Value	46.7	19.2	37.4	6.3	21.4
5	30 th Percentile Value	47.7	19.5	38.5	6.5	21.7
6	40 th Percentile Value	48.6	19.7	39.2	6.7	22.2
7	50 th Percentile Value	49.9	20.3	40.3	6.9	22.6
8	60 th Percentile Value	52.3	21.3	41.5	7.3	23.4
9	70 th Percentile Value	53.6	21.8	42.3	7.5	23.9
10	80 th Percentile Value	55.2	23.6	42.9	7.8	24.5
11	90 th Percentile Value	60.4	25.3	44.5	8.3	25.4
12	95 th Percentile Value	61.7	26.1	45.3	8.6	26.0
13	98 th Percentile Value	62.5	26.7	46.5	8.6	26.3
14	Arithmetic Mean	53.1	22.0	41.3	7.3	23.5
15	Geometric Mean	52.8	21.8	41.2	7.2	23.4
16	Standard Deviation	6.2	3.0	3.3	1.0	1.9
17	Minimum	45.5	18.4	36.2	5.7	20.9
18	Maximum	62.5	26.7	46.5	8.6	26.3
19	NAAQ Norms*	-	100.0	60.0	80.0	80.0
	% Values exceeding Norms*	0.0	0.0	0.0	0.0	0.0

Legend: PM_{2.5}-Particulate Matter size less than 2.5 µm; PM₁₀-Respirable Particulate Matter size less than 10 µm; SO₂-Sulphur dioxide; NO₂- Nitrogen Dioxide; CO-Carbon monoxide; O₃-Ozone; NH₃-Ammonia; Pb-Particulate Lead; As-Particulate Arsenic; Ni-Particulate Nickel; C₆H₆-Benzene &BaP- Benzo (a) pyrene in particulate phase levels were monitored below their respective detectable limits.

* NAAQ Norms-National Ambient Air Quality Norms-Revised as per GSR 826(E) dated 16.11.2009 for Industrial, Residential, Rural and other Areas.

3.3.8 AIR QUALITY MODELLING

Prediction of particulate emissions, ISC-AERMOD View 9.1 model was used to predict changes in air quality i.e., maximum ground level concentration (GLC's) of PM₁₀ and PM_{2.5} due to the proposed mining activity. The inputs required for the model is:

- Hourly meteorological data
- Source data
- Receptor data
- Program control parameters

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

The mathematical model used for predictions on air quality impact in the present study is ISC-AERMOD View 9.1. It is the next generation air dispersion model, which incorporates planetary boundary layer concepts.

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

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

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

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

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

SOURCE CHARACTERIZATION

A detailed listing of all emission sources and their corresponding modeling input release parameters and emission rates are listed this report. A general description of how each source type was treated is presented below.

The emission Sources from the proposed operation are

TABLE 3.19: EMISSION SOURCE

ACTIVITY	PROCESS SOURCES	FUGITIVE DUST SOURCES
Mining	Drilling	Blasting
		Loading and Hauling
	Transportation	Haul Roads

POINT SOURCES

Point sources for mining operations typically include drilling blasting activities, Movement of Heavy Earth moving machineries, loading and unloading activities. At the present project site the following sources are anticipated.

1. Hydraulic excavator
2. Air Compressors for drilling
3. Tippers for haulage
4. Drilling and blasting (occasionally)

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

Volume Sources

A road network was developed to depict the anticipated haul truck routes and truck discharge locations during the mine operations. The anticipated emissions from the road sources and corresponding anticipated impact during the monitoring period of December 2021 to February 2022 emissions were estimated. Emissions due to haul road on the unpaved road network were modeled as volume sources. The model volume source parameter for the haul roads initially utilized USPEA developed emission factors for hauling trucking. The haul road sources utilized source to source spacing of 6 meters along the simulated haul roads. The initial lateral dimension of the sources was set to 3 m were used as an input to replicated a 2 truck travel adjacent for a typical mining scenario.

The parameters considered for the hauling operation include the following

- size of haul trucks commonly used –
- degree of dust control/compaction of permanent haul roads

OTHER FUGITIVE PARTICULATE SOURCES

Other fugitive particulate emission sources that were modeled as volume sources include the following:

- Fugitive emissions from trucks, loading and unloading were represented by single volume sources. The release heights for these sources were set to the actual height of the truck transfer process.
- As the mining area is predominately sedimentary terrain Fugitive emissions due to wind erosion is considered.

Particulate and Gaseous Emissions Due to Blasting occasionally

The emissions due to blasting is considered being of minimal impact, since the limestone is sold to needy industries in the raw form, no processing is proposed hence the dust due to blasting is minimal.

However, small quantity of explosive like slurry etc., are also used for secondary fragmentation. Therefore any emissions due to such operations would be localized and would cause minor environmental impact occasionally.

TABLE 3.20: AVERAGE IN-USE EMISSION RATES FOR HEAVY DUTY VEHICLES

Pollutant	HDDV (diesel) (grams/mile)	Emission rate assuming Vehicle Travel within the project at 40 KM/h(g/s)
NO _x	8.613	0.029906
Pm _{2.5}	0.202	0.001403

FIGURE 3.13: TERRAIN OF THE STUDY AREA

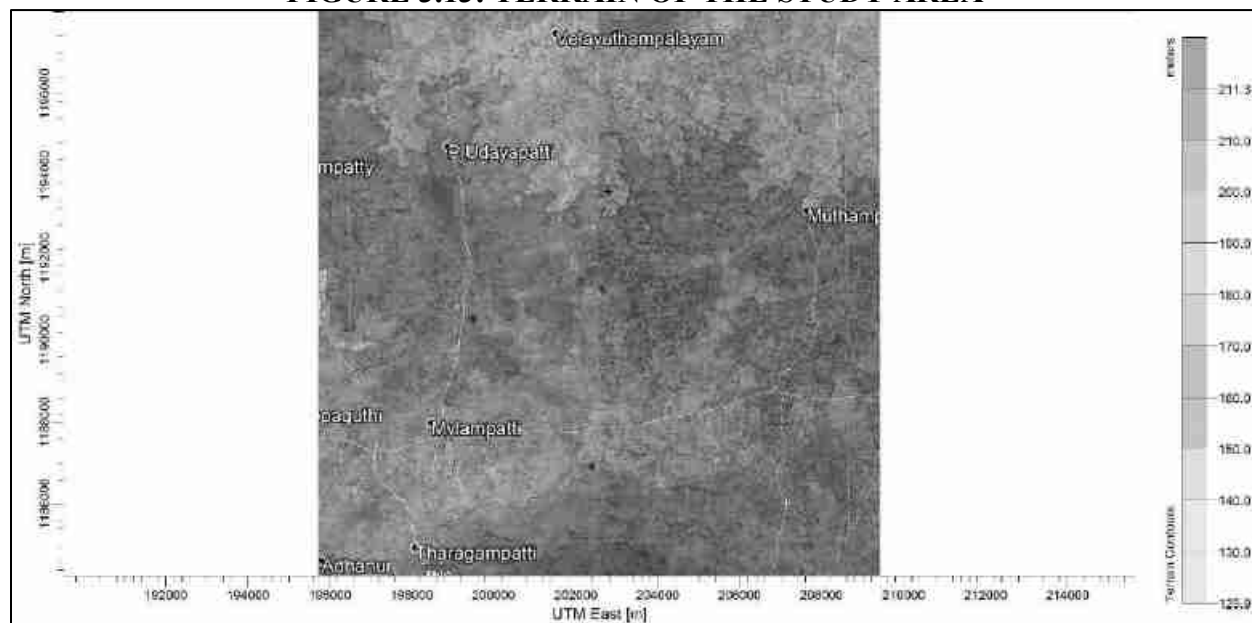


FIGURE 3.14: PM₁₀ - 24 HOURS AVERAGE



FIGURE 3.15: PM_{2.5} - 24 HOURS AVERAGE

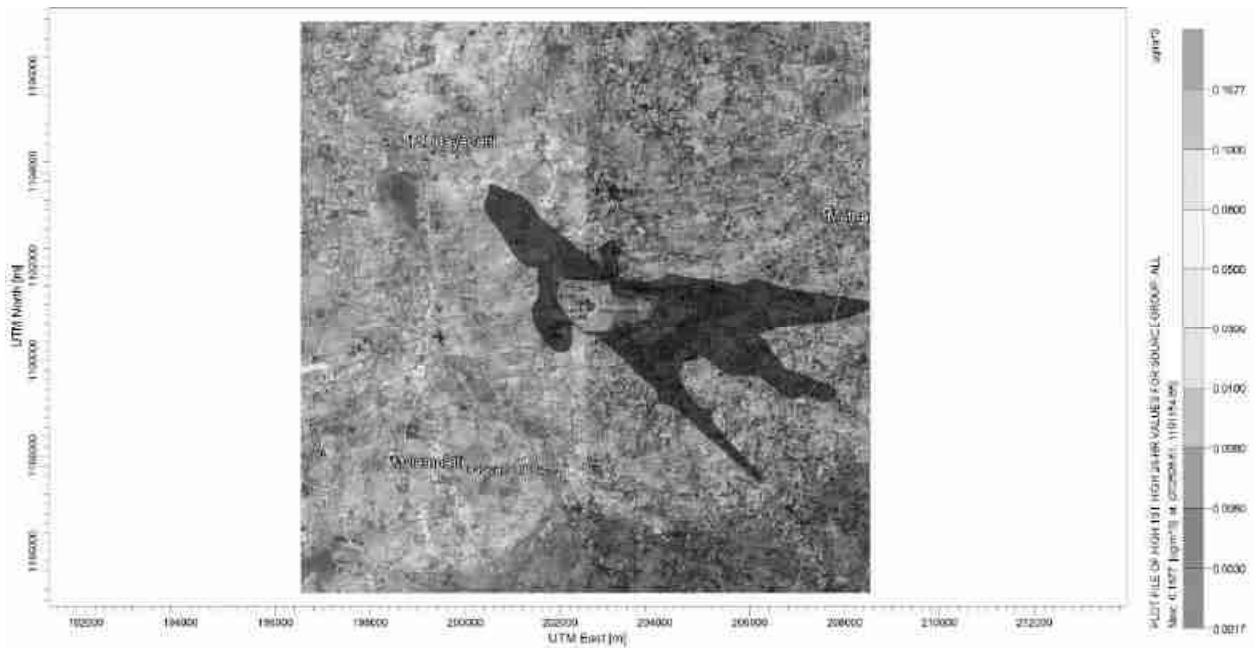
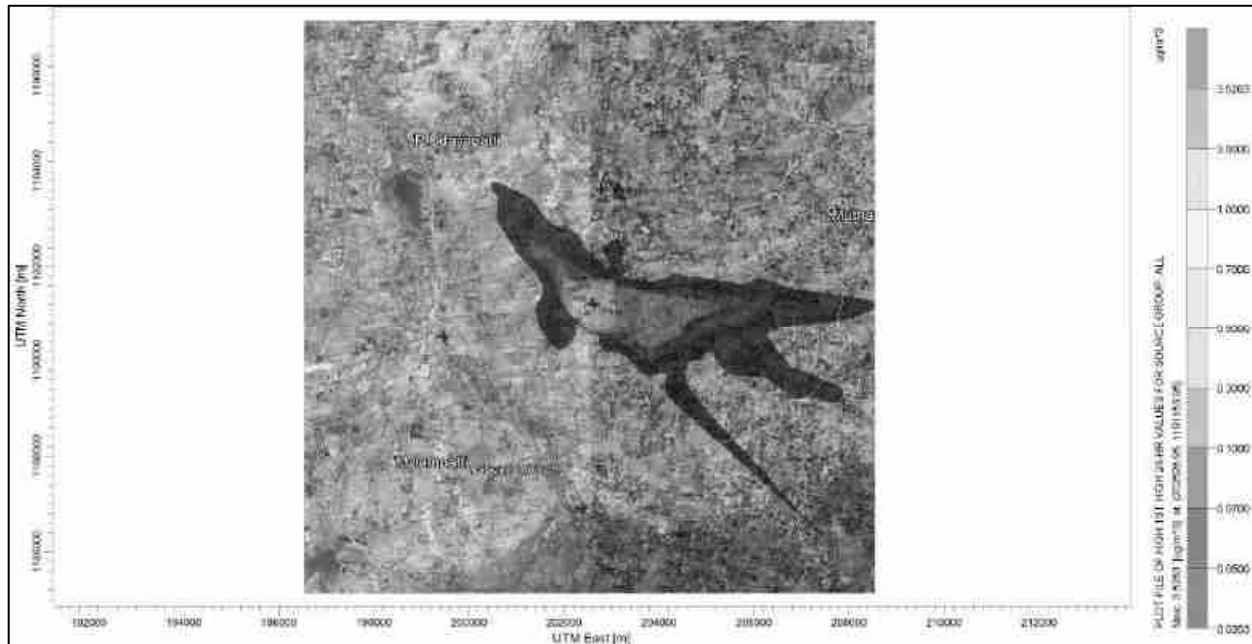


FIGURE 3.16: NO_x -24 HOUR AVERAGE

RESULTS AND CONCLUSIONS

The ground level concentrations are computed for 24-hr average. The combined ground level concentrations of PM₁₀ and NO_x from the different mining activities at different nearby locations within the study area for the study period are given in table 3.21. The maximum GLC's were falling within the lease area for the given meteorological and topographical conditions.

3.3.9 OBSERVATIONS OF RESULTS

PM₁₀: The maximum and minimum concentrations for PM₁₀ were recorded as 43.50 μg/m³ and 40.0 μg/m³ respectively. The maximum concentration was recorded at the Thennilai village and the minimum concentration was recorded at project site. The average concentrations are 42.08 μg/m³. CPCB standard for PM₁₀ within 100 μg/m³ therefore it is observed that the ambient air monitoring results obtained are well within the prescribed standard with respect to PM₁₀.

PM_{2.5}: The maximum and minimum concentrations for PM_{2.5} were recorded as 23.10 μg/m³ and 20.00 μg/m³ respectively. The maximum concentration was recorded at the Thenniali and the minimum concentration was recorded at project site. The average concentrations are 21.68 μg/m³. CPCB standard for PM_{2.5} within 60 μg/m³ therefore it is observed that the ambient air monitoring results obtained are well within the prescribed standard with respect to PM_{2.5}.

SO₂: The maximum and minimum SO₂ concentrations were recorded as 6.5 µg/m³ and 4.0 µg/m³. The maximum concentration was recorded at Periyamanakudi and the minimum concentration was recorded at Project site. The average value is 5.22 µg/m³. CPCB standard for SO₂ within 80µg/m³ therefore it is observed that the ambient air monitoring results obtained are well within the prescribed standard with respect to SO₂.

NO_x: The maximum and minimum NO_x concentrations were recorded as 23.60µg/m³ and 19.00 µg/m³. The maximum concentration was recorded at Keeranur and the minimum concentration was recorded at project site. The average value is 21.68µg/m³. CPCB standard for NO_x within 80µg/m³ therefore it is observed that the ambient air monitoring results obtained are well within the prescribed standard with respect to NO_x.

The concentrations of PM₁₀, PM_{2.5}, SO₂, NO_x, and Pb are observed to be well within the standards prescribed by Central Pollution Control Board (CPCB) for Industrial, Rural, Residential and Other area. Whereas, the concentration heavy metals like Benzene, Ni, CO and as was observed is below detection limits (BDL).

National Ambient Air Quality Standard: The levels of air quality with an adequate margin of safety, to protect the public health, vegetation and property. Whenever and wherever two consecutive values exceed the limit specified above for the respective category, it would be considered adequate reason to institute regular/continuous monitoring and further investigations:

1. 24-hrs./8-hrs.values should be met 98% of the time in a year; however, 2% of the time it may exceed but not on two consecutive days.
2. Annual arithmetic mean of minimum 144 measurements in a year taken twice a week 24-hourly at uniform interval.

Carbon Monoxide (CO) concentrations were monitored <1.0 mg/m³ at all the monitoring locations against the NAAQ limit value of 4mg/m³(annual mean).

Ozone (O₃) concentrations were monitored <5µg/m³ at all the monitoring locations against the NAAQ limit value of 180µg/m³ (annual mean).

Ammonia (NH₃) concentrations were monitored <5µg/m³ at all the monitoring locations against the NAAQ limit value of 400 µg/m³ (annual mean).

Lead (Pb) concentrations were monitored $<0.01 \mu\text{g}/\text{m}^3$ at all the monitoring locations against the NAAQ limit value of $1 \mu\text{g}/\text{m}^3$ (annual mean).

Arsenic (As) concentrations were monitored $<5.0 \text{ng}/\text{m}^3$ at all the monitoring locations against the NAAQ limit value of $6 \text{ng}/\text{m}^3$ (annual mean).

Nickel (Ni) concentrations were monitored $<3.0 \text{ng}/\text{m}^3$ at all the monitoring locations against the NAAQ limit value of $20 \text{ng}/\text{m}^3$ (annual mean).

Benzene (C₆H₆) concentrations were monitored $<1.0 \text{ng}/\text{m}^3$ at all the monitoring locations against the NAAQ limit value of $5.0 \text{ng}/\text{m}^3$ (annual mean).

Benzo(a) Pyrene (BaP) concentrations were monitored $<0.5 \text{ng}/\text{m}^3$ at all the monitoring locations against the NAAQ limit value of $1.0 \text{ng}/\text{m}^3$ (annual mean).

Interpretations

While comparing with the **National Ambient Air Quality (NAAQ) Standards revised as per CPCB Notification No B-29016/20/90/PCI-L Dated: 18.11.2009**, all monitored values were found to be well within the prescribed limit values for 24-hourly periods for Industrial, Residential, Rural and other Areas.

3.4 NOISE ENVIRONMENT

Noise is any sound that is undesirable because it interferes with speech and hearing. The environment impact of noise can have several effects varying from noise induced hearing loss to annoyance depending on loudness of noise levels.

The main objective of noise monitoring in the study area is to establish the baseline noise levels and assess the impact of the total noise expected to be generated in the surrounding areas by implementation of the proposed project.

Noise level monitoring has been conducted in the study area once in a season 04, 05, 18, 19, 25 and 26th January 2022 to assess the background noise levels in different zones viz., Residential, Industrial, Commercial and Silence zones.

3.4.1 Methodology

Noise level monitoring in the study area was carried out 60 minutes during over a period of 24Hours as per the Ambient Noise quality standards under environmental (protection) Act 1986.

Identification of Sampling Locations

Seven locations were selected for the noise level monitoring stations based on the population and activities in the study area. The locations of the noise level monitoring stations are given below as **Table. 3.22**

TABLE 3.22: NOISE LEVEL MONITORING DONE IN THE LOCATION

S. No	Location code	Monitoring Locations	Distance & Direction	Coordinates
1	N-1	Core Zone	Project Area	10°45'47.57"N 78°16'46.85"E
2	N-2	Core Zone	Adjacent Quarry	10°45'50.04"N 78°16'41.96"E
3	N-3	Thalambakoundanur	1.3km E	10°45'50.45"N 78°17'35.03"E
4	N-4	Mamarathupatti	2.8Km SW	10°45'25.83"N 78°15'10.79"E
5	N-5	Budwadi	4.0km NE	10°47'59.30"N 78°17'29.03"E
6	N-6	Chinnatampatti	4.4km NW	10°48'0.59"N 78°15'49.54"E
7	N-7	Mathagiri	5.4Km SE	10°43'18.73"N 78°18'31.82"E
8	N-8	Mylampatti	4.5km SW	10°44'9.57"N 78°14'52.24"E

Instrument Used for Monitoring

Noise levels were measured using a sound level meter (LUTRON / SL - 4030). The sound level meter measures the Sound Pressure Level (SPL), the Maximum Sound Pressure Level (max) and the equivalent continuous noise level (Leq) by switching on the corresponding functional modes.

Method of Monitoring

Sound Pressure Level (SPL) measurements were taken at the specified locations, with an interval of 60 minutes over a period of 24 hours as per the Ambient Noise quality standards notified under Environmental (Protection) Act 1986. The noise levels during day time have been monitored between 6 am to 10 pm and night noise levels during 10 pm to 6 am at all the locations covered in the study area. To obtain noise levels at 8 AM, noise readings, with setting at 'A' response - slow mode, were recorded continuously for every 1 hour. All the readings were obtained for 24 hours.

FIGURE 3.17: NOISE LEVEL MONITORING SURVEY PHOTOS



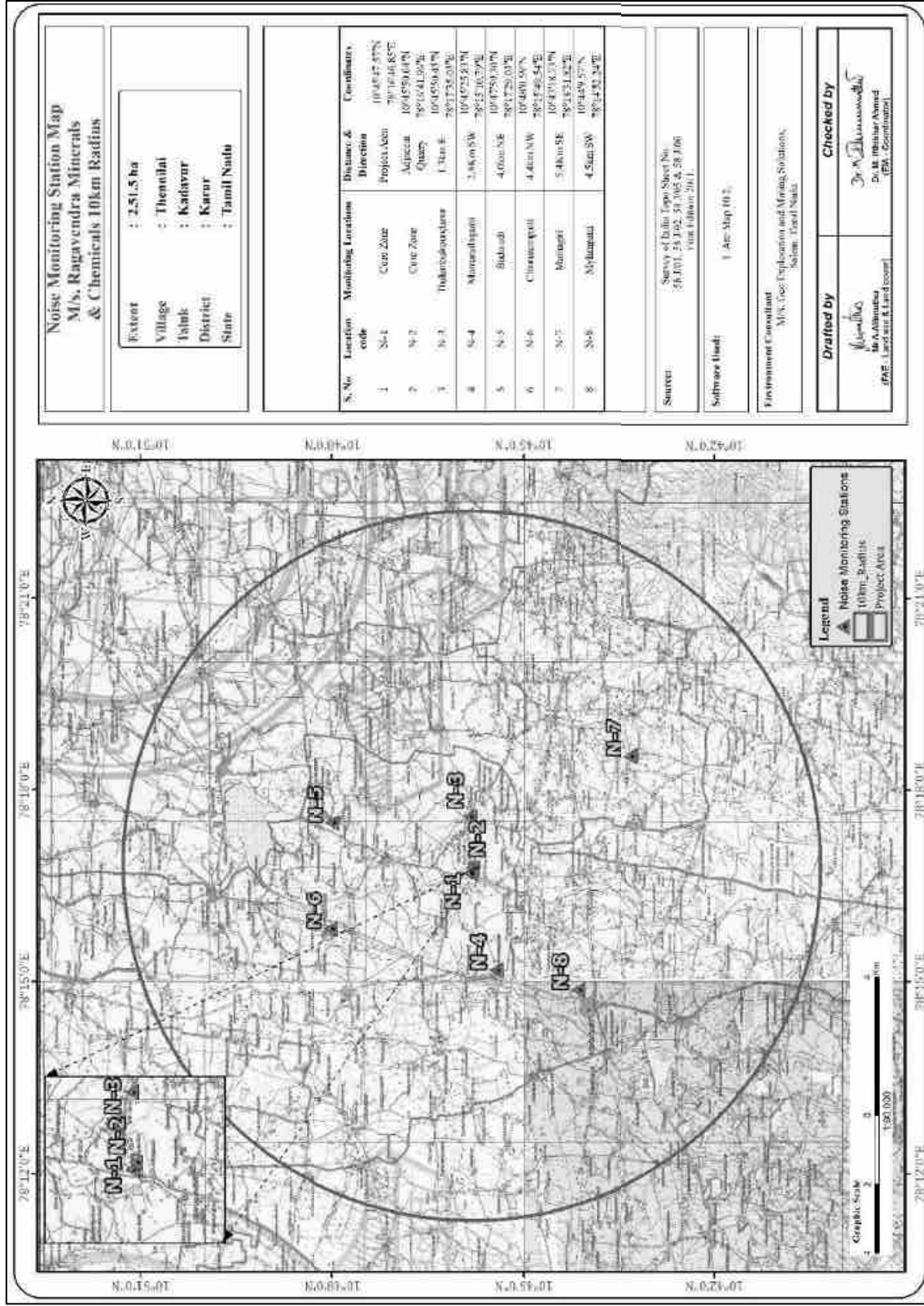
Parameters Measured During Monitoring

For noise levels measured over a given period of time interval, it is possible to derive important features of noise using statistical methods.

L_{day} Average noise levels between 6.00 hours to 22.00 hours.

L_{night} Average noise levels between 22.00 hours to 6.00 hours.

FIGURE 3.18: NOISE MONITORING LOCATION MAP



3.4.2 Presentation of Results

The summary of computed ambient noise level parameters like L_{day} and L_{night} for all the sampling locations are presented in **Table.3.23** and compared to the standards specified by ANQS Under EP Act 1986 as given in **3.23**

Monitoring Date: 03, 04, 10, 12, 18, 19 & 25 Jan 2022

Table 3.23: AMBIENT NOISE LEVELS

S. No	Locations	Noise level (dB (A) Leq)		Ambient Noise Standards
		Day Time	Night Time	
1	Core Zone	39.2	34.6	Industrial Day Time- 75 dB (A) Night Time- 70 dB (A)
2	Core Zone	39.1	35.8	
3	Thalambakoundanur	41.9	37.1	Residential Day Time- 55 dB (A) Night Time- 45 dB (A)
4	Mamarathupatti	37.7	35.7	
5	Budwadi	38.6	35.3	
6	Chinnatampatti	39.2	37.8	
7	Mathagiri	39.8	36.8	
8	Mylampatti	39.6	35.3	

Interpretation.

Ambient noise levels were ranging from 39.1 dB(A) to 41.9 dB(A) during day times and from 34.6 dB(A) to 37.8 dB (A) during night times on the monitoring day. Average Day Equivalent Noise (Leq-d) level was found to be 39.4 dB(A) and Night Equivalent Noise (Leq-n) level was 36.1 dB(A). While comparing with the MoEF & CC Leq Norms for day and night, the monitored ambient noise levels were well within the prescribed limits **<55 dB(A) during day and <45 dB(A) during night**, for Residential Areas.

3.5 BIOLOGICAL ENVIRONMENT

Biological environment of any area constitute all living beings of that area, it is an integral part of the environment. Hence, any change in the surrounding environment could cause loss of species or decrease in biodiversity of the area. Therefore, the present study is proposed to assess the impact of the proposed projects on biological environment of the project site and surrounding area within 10Km radius. Accordingly, mitigation measures are evolved to sustain the biological diversity. In general biological environment is represented by flora and fauna. Flora constitutes the herbs, shrubs and trees and fauna constitutes the mammals, birds, reptiles, arthropods, amphibians, fishes etc.,

3.5.1 OBJECTIVE OF THE STUDY

The major objectives of the study were:

- To document the diversity of the local flora within core & buffer zone.
- To enlist the major agricultural crops, plantations and cultivated species.
- To document the major fauna both invertebrate and vertebrate occurring in the selected 10Km study area.

3.5.2 STUDY APPROACH & METHODOLOGY ADOPTED

The baseline study for existing ecological environment was carried out during December 2021 to February, 2022. A participatory and consultative approach was followed. Field visits were undertaken for survey of the vegetation and animals in the study area. The study area has been divided into two parts as core area consisting of project site and the buffer area as the 10 km radius of the project site.

3.5.3 SAMPLING METHODOLOGY

Flora status was assessed in different habitat types and project site of the study area. Quantitative data was collected using standard methods of quadrat method. Flora enumeration was done following standard sampling techniques. Random quadrats were laid in order to quantify the vegetation of the study area. Quadrat size for trees was 100 x 100m, for shrubs it was 5 x 5 m and for herbs it was 1 x 1m. Plots of 1 x 1 m were laid within the tree quadrat at each corner to record grasses. In each of the quadrats, species and their number were recorded.

3.5.4 FLORA & FAUNA AT THE STUDY AREA

FLORA IN THE CORE ZONE (ML Area)

No major vegetation was found since the proposal is an existing mine.

Trees

Sl. No.	Scientific Name	Family	Common Name
1.	<i>Azadirachta indica</i>	Meliaceae	Neem (Vembu)
2.	<i>Borassus flabellifer</i>	Arecaceae	Palmyra Palm

Shrubs

Sl. No.	Scientific Name	Family	Common Name
1.	<i>Abutilon indicum</i>	Malvaceae	Indian mallow, Thuthi
2.	<i>Solanum torvum</i>	Solanaceae	Turkey berry, Sundaikkai

Herbs

Sl. No.	Scientific Name	Family Name	Common Name
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1.	<i>Euphorbia hirta</i>	Euphorbiaceae	Asthma Plant, Ammaan Pachcharisi
2.	<i>Argemone Mexicana</i>	Papaveraceae	Prickly Poppy, Kudiyotti
3.	<i>Solanum trilobatum</i>	Solanaceae	Thoothuvalai

FLORA IN THE BUFFER ZONE

List of Trees

Sl. No.	Name of the plant (Scientific)	Family Name	Common Name	Local name
1.	<i>Cocos nucifera</i>	Arecaceae	Coconut, Thennai	Thennai
2.	<i>Psidium gujava</i>	<i>Myrtaceae</i>	Guava	Koiya
3.	<i>Musa paradisiaca</i>	Musaceae	Plantain, Vazhai	Vaalai maram
4.	<i>Pongamia pinnata</i>	Fabaceae	Indian Beech,	Pungam
5.	<i>Azadirachta indica</i>	Meliaceae	Neem,	Vembu
6.	<i>Borassus flabellifer</i>	Arecaceae	Palmyra Palm	<i>Panaimaram</i>
7.	<i>Pithecellobium dulce</i>	Fabaceae	Kodukkapuli	<i>Kodukkapuli</i>
8.	<i>Prosopis juliflora</i>	Fabaceae	Algaroba,	Seemaikaruvel
10	<i>Moringa oleifera</i>	Moringaceae	Drumstick,	<i>Murungai</i>
11	<i>Tamarindus indica</i>	Fabaceae	Tamarind,	<i>Puliyamaram</i>

List of Shrub

S.No	Name of the plant (Scientific)	Family Name	Common Name	Local Name
1	<i>Argemone mexicana</i>	Papaveraceae	Prickly poppy,	Kudiyotti
2.	<i>Calotropis gigantea</i>	Asclepiadaceae	Crown Flower,	Erukku
3.	<i>Tree</i>	Fabaceae	Aavarampoo	Avarampoo
5	<i>Solanum torvum</i>	Solanaceae	Turkey berry,	Sundaikkai
6	<i>Solanum trilobatum</i>	Solanaceae	Thoodhuvalai	<i>Thooduvalai</i>
7	<i>Adathoda vasica</i>	Acanthaceae	Vasaca,	Adathodai

List of Herbs

S.No	Name of the plant (Scientific)	Family Name	Common Name	Local name
1	<i>Oryza sativa</i>	Poaceae	Rice	Nel
2	<i>Abutilon indicum</i>	Malvaceae	Country Mallow, Tutti	Tutti
3	<i>Agave sisalana</i>	Agavaceae	Sisal	Kathalai,
4	<i>Aloe vera</i>	Liliaceae	Kathalai	Sothu Kathalai
5	<i>Aristida adscensionis</i>	Poaceae	Coomon Needle grass	Korai pul
6	<i>Euphorbia hirta</i>	Euphorbiaceae	Asthma weed,	Ammam Paccharisi
8	<i>Tridax procumbens</i>	Asteraceae	Tridax daisy,	Vettukkaayapoondur
10	<i>Amaranthus viridis</i>	Amaranthaceae	slender amaranth	Kuppaikeerai

Fauna

Fauna in the Core zone (ML Area)

Mammals:

Scientific name	Common name	WPA 1972 Schedule	IUCN Status

Funa mbuluspalmarum	India palm squirrel	IV	Least concern
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Avian fauna:

Scientific name	Common name	WPA 1972 Schedule	IUCN Status
Corvussplendens	House Crow	IV	Least concern
Acridotherestrictis	Common myna	IV	Least concern
Buteobuteo	Common buzzard	IV	Least Concern

Fauna in the Buffer Zone

AMPHIBIANS				
S.No	Scientific Name	Common Name	WPA 1972 Schedule	IUCN Status
1	Bufo melanrostictus	Common Indian Toad	IV	Least concern
2	Euphlyctis cyanophlyctis	Skittering frog	IV	Least concern
REPTILES				
1	Ahaetulla nasuta	Common Green Whip Snake	IV	LC
2	Calotes versicolor	Common Garden lizard	IV	LC
3	Hemidactylus	House gecko	IV	LC

BIRDS				
S.No	Scientific Name	Common Name	WPA 1972 Schedule	IUCN Status
1	Acridotheres tristis	Common myna	IV	LC
2	Ardeola grayii	Pond Heron or Paddy	IV	LC
3	Athene brama	Spotted Owlet	IV	LC
4	Bubo bubo	Indian great horned owl	IV	LC
5	Bubulcus ibis	Cattle egret	IV	LC
6	Centropus sinensis	Crow-Pheasant or	IV	LC
7	Corvus splendens	House Crow	IV	LC
8	Passer domesticus	House Sparrow	IV	LC
9	Psittacula krameri	Rose Ringed Parakeet	IV	LC
MAMMALS				
1	Bandicota indica	Bandicoot	IV	LC
2	Atherurus macrourus	Asiatic Brush tailed porcupine	IV	LC
3	Bos indicus	Cow	IV	LC
4	Bubalus bubalis	Buffalo	IV	LC
5	Capra hircus	Goat	IV	LC
6	Funambulus palmarum	Indian Palm squirrel	IV	LC
7	Macaca radiata	Bonnet macaque	IV	LC
INSECTS				
S.No.	Scientific Name	Common Name		

1.	Agrion sp & Petalura sp	<i>Dragon fly</i>	IV	LC
2.	<i>Anis indica</i>	<i>Hon ev hee</i>	IV	LC
3.	Aranea sp	<i>Spider</i>	IV	LC
4.	Carausius sp	<i>Stick insect</i>	IV	LC
5.	Cicada sp.	<i>Cicade</i>	IV	LC
6.	Coenagrion sp & Ischnura	<i>Damsel fly</i>	IV	LC
7.	Eumenus	<i>Wasp</i>	IV	LC
8.	Hieroglyphus sp	<i>Grasshopper</i>	IV	LC
9.	Mantis religiosa	<i>Praying mantis</i>	IV	LC
10.	Monomorium indicum	<i>Ant</i>	IV	LC
11.	Palamnaeus swammerdam	<i>Scorpion</i>	IV	LC
12.	Scolopendra	<i>Centipede</i>	IV	LC
BUTTERFLIES				
1.	Acraea terpsicore	<i>Tawny coster</i>	IV	LC
2.	Danaus plexippus	<i>Striped tiger</i>	IV	LC
FISH				
1.	Cirrhinus mrigala	<i>Mrigal</i>	IV	LC
2.	Cyprinus carpio	<i>Common Carp</i>	IV	LC

Among the flora recorded most of them are common residence population and no endangered species in the study area.

Interpretation:

There is no schedule I species of animals observed within study area as per Wildlife Protection Act 1972 as well as no species is in vulnerable, endangered or threatened category as per IUCN. There is no endangered red list species found in the study area. Hence this small mining operation over short period of time will not have any significant impact on the surrounding flora and fauna.

3.6 SOCIO-ECONOMIC ENVIRONMENT

To assess the impact on the socio economic environment, it is essential to collect the following data:

- Population surrounding the project site those likely to be targeted receptor of impact
- Employment pattern
- Infrastructure facilities available to the local population such as water supply and sanitation electricity, roads, education and medical facilities.
- Land use pattern.

Information on the Socio economic front has been collected from various secondary sources including 2011 published census data, Government and semi government office.

3.6.1 OBJECTIVES

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

- To study the socio-economic status of the people living in the study area of the proposed mining project.
- To assess the impact of the project on socio-economic environment in the study area.
- To assess the impact of the project on Quality of life of the people in the study area.
- To evaluate the community development measures proposed to be taken up by the project proponent, if any.
- To recommend Community Development measures needs to be taken up in the study area.

3.6.2 METHODOLOGY ADOPTED FOR THE STUDY

- A mixture of both quantitative and qualitative approach has been adopted in the current socio-economic study.
- The study has been conducted based on primary and secondary data. While primary data has been collected through a sample survey of selected households, the secondary data has been collected from the administrative records of the Government of Tamil Nadu, Census 2011, District hand books etc.
- The details regarding population composition, number of literates, workers etc., have been collected from secondary sources and analyzed. Also village/city/town wise details regarding amenities available in the study area have been collected from secondary sources and analyzed.
- Random Sampling has been adopted to select the sampling units.
- Estimation of various parameters has been made based on sample data and bottom top approach has been adopted.
- The data collected during the above survey was analyzed to evaluate the prevailing socio-economic profile of the area.
- Based on the above data, impacts due to mining operation on the community have been assessed and recommendations for improvement have been made.

3.6.3 DESCRIPTION OF THE STUDY AREA

The study area covers villages located in the 10 Km radius around the mine lease periphery covering over 29 villages. The list of villages along with the population details is given in Table 3.24

3.6.3.1 Review of the study area:

The study area is in the Thenniali village of Kadavur Taluk, Karur District.

Total extent of the study area (10KM Radius)	=	32,454Ha/324.54 KM ² .
Total Population	=	1,17,652
Total No of Household	=	28,269
Total male population	=	58,513
Total female population	=	59,139
Population density per KM ²	=	362 persons/ KM ²
Sex ratio	=	984
District head quarters	=	Karur

3.6.3.2 Demography of Thennilai village: (Source: District Sensex hand book 2011)

Total extent of the area	=	20.02 KM ²
Total population	=	4323
Total house holds	=	1174
Male population	=	2172
Female population	=	2151
Literacy rate	=	55.63 %

3.6.4 POPULATION OF THE STUDY AREA

The statistics, regarding the human population and the no of dwelling units of villages in the study area is given as 29 villages in the buffer zone, there is no habitations/Group of houses in the core zone. Population and dwelling units in the study area are given in **Table 3.24**. This information is taken from the Census of India, 2011. On this basis, the population of the study area is estimated to be 1,17,652 i.e. within a 10 Km periphery or 324.54 KM² area gives a population density of about 362 persons / KM².

About 41.99% population depends upon the agriculture, 10-15 % population depends upon the seasonal agriculture about 10-12% of the population depends upon self-employment like petty shop, small hotels, agro shops etc., about 5% of the population are employed in foreign country both literate and illiterate about 2% of the population rely on self-employment scheme (100 days workers scheme) 5% of the population are employed in Government and private sector companies besides a small amount of population are elderly persons, sick persons, handicap and un employed.

3.6.5 LITERACY:

Of the total population 55.63% belongs to literate category. Amongst this, male and female constitute 58.09% and 41.91% respectively.

3.6.6 WORKERS OCCUPATIONAL PATTERN IN THE STUDY AREA:

The occupational profile has been classified based on the available 2011 Census classification. A person is treated as main worker if the person has worked for a major part of the year, i.e. 183 days or more. A marginal worker is a person who worked for some time during the year but not for 183 days. The main workers have been further categorized as cultivators, agricultural labourers, household industry workers and other workers. Household industry relates to production, processing, repairing, making and selling of goods at household level. The other workers include factory employees, plantation workers, persons engaged in trade, commerce, business, transport, mining, construction, social work, entertainment as well as government employees, teachers and priests.

TABLE 3.24: OCCUPATIONAL PATTERN OF THE AREA

S.NO	DESCRIPTION	NO OF PEOPLES	PROPORTION
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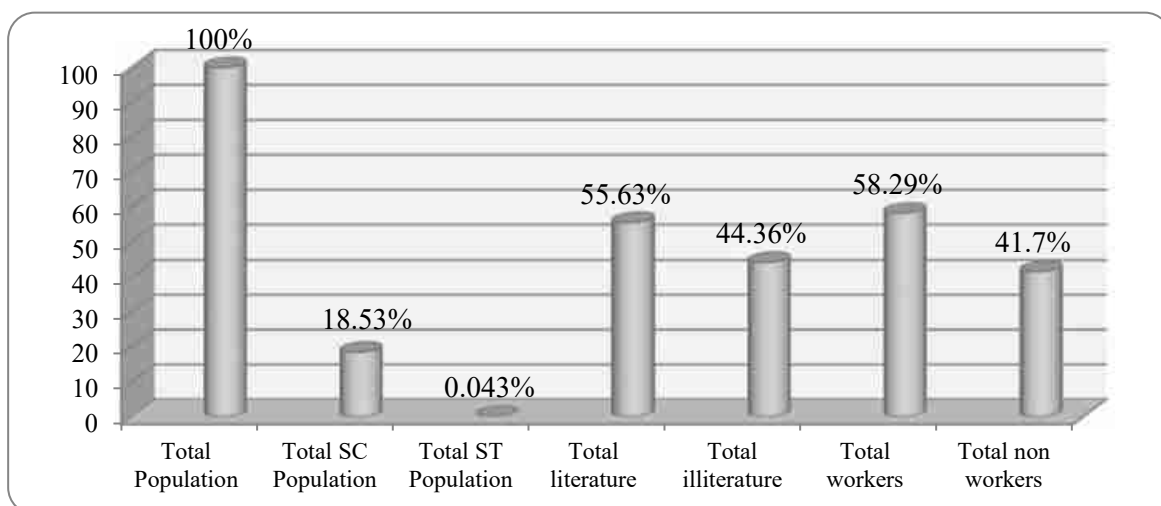
1	Total Population	1,17,652	100
2	Total Workers	65,856	58.29
3	Non workers	49,066	41.70
4	Main Workers	62,162	90.63
5	Main Cultivation workers	19,051	16.19
6	Main Agriculture workers	30,363	25.80
7	Main other workers	12,229	10.39
8	Marginal Worker	6,424	9.36
9	Margin cultivation workers	735	0.62
10	Marginal house hold workers	116	1.68
11	Marginal other workers	5153	80.21

Source: District primary census handbook 2011.

TABLE 3.25: DEMOGRAPHY PROFILE OF THE STUDY AREA

Sl. No.	Village Name	No. of House Hold	Total Population	Male	Female	Total SC Population	Total ST Population	Total Literate Population	Male Literate	Female Literate	Total Illiterate Population	Male Illiterate	Female Illiterate	Total Workers Population	Male Workers	Female Workers	Total Main Workers	Main Agriculture Workers	Main Cultivation Workers	Main Other Workers	Total Margin Workers	Margin Cultivation	Margin House Hold Workers	Margin Other Workers	Non Workers Population
1	Adhanur	821	302	149	153	127	0	187	106	806	115	427	725	191	100	912	144	509	592	2	47	37	35	22	110
2	Aniyappur Chinniyampalaya	146	627	317	309	118	0	390	224	166	236	934	142	375	196	178	368	117	184	63	69	14	4	18	251
3	m	427	202	104	984	450	0	788	476	312	123	565	672	131	684	635	122	566	443	0	92	1	0	4	706
4	Dhavalaveerampatti	790	305	146	158	372	0	179	102	769	126	445	816	176	917	847	174	869	499	35	6	3	1	13	128
5	Kalayapatti	488	207	102	104	503	0	125	729	526	820	297	523	123	638	592	969	357	323	28	26	6	3	23	845
6	Kalugur	163	702	347	354	117	0	379	218	160	323	129	193	382	211	170	352	130	125	92	30	7	0	23	319
7	Keeranur	124	546	272	274	460	1	295	177	118	251	3	156	323	169	154	241	826	946	64	81	23	3	98	223
8	Kosur	171	763	381	381	125	2	332	201	130	431	180	251	425	221	204	362	210	111	39	63	32	18	69	338
9	Manjanaickempatti	120	463	227	236	580	0	286	163	123	177	643	112	277	142	135	272	122	800	1	55	7	1	22	186
10	Mathagiri	559	261	128	133	621	0	136	417	304	688	283	405	147	455	400	844	202	442	20	11	0	0	9	554
11	Mavathur	157	670	337	333	206	2	398	230	167	272	106	165	375	201	174	361	227	815	52	14	4	1	30	294
12	Melappaguthi	130	527	258	268	125	0	277	158	118	250	997	150	304	158	145	292	198	466	198	47	11	2	49	223
13	Muthurengampatti	350	140	700	709	261	0	721	417	304	688	283	405	855	455	400	844	202	442	19	8	11	0	9	554
14	Naganur	902	430	211	218	118	0	253	146	106	176	647	112	244	127	116	238	103	648	69	7	53	2	0	186
15	Panajapatti	109	427	209	218	108	1	271	150	120	156	587	981	219	122	968	215	116	385	54	33	5	4	16	208
16	Pannapatti	935	368	182	185	2	0	239	132	107	128	507	776	240	123	117	208	101	4	36	32	9	7	85	127
17	Pappakkapatti	130	535	264	270	842	0	262	151	111	273	113	159	276	162	114	273	175	544	41	31	3	0	11	258
18	Pappayambadi	342	143	726	706	297	0	849	490	359	583	236	347	882	462	420	872	120	120	18	10	0	0	4	550
19	Pothuravuthampatti	123	526	259	267	601	0	267	157	110	258	101	156	316	161	155	286	101	9	63	30	1	13	68	209
20	Sengal	102	384	190	194	554	4	216	126	901	168	638	104	211	117	946	208	621	62	817	8	33	1	0	173
21	Thennilai	117	432	217	215	493	3	242	148	944	189	689	120	245	131	114	240	128	679	42	54	5	3	10	186
22	Thondamanginam	109	494	248	246	651	2	261	152	109	233	137	137	286	149	136	202	101	743	24	83	17	4	208	
23	Vadavambadi	656	275	139	135	355	0	138	835	546	137	558	813	174	904	845	155	892	400	26	19	5	0	1	100
24	Vaiyamaipalaya	194	867	425	442	248	2	690	386	304	177	39	138	656	333	323	650	602	33	13	6	1	0	2	211

25	Valvarmangalam	471	207	100	107	197	0	126	661	604	809	339	470	129	632	666	128	984	230	65	16	7	0	5	776
		126	498	248	250	103		302	176	125	195		124	280	145	134	238		126	72	41				218
26	Varavanai	1	5	1	4	4	32	7	8	9	8	713	5	0	2	8	2	385	4	4	8	21	3	16	5
27	Veeriyapalayam	908	353	176	176			182	108	738	170		102	220	113	107	218		120	55	18	2	0	11	132
		115	494	249	244			268	161	107	225		137	305	156	148	243		118	28	61	29	5	2	189
28	Vellalapatti	4	2	7	5	915	0	7	6	1	5	881	4	1	2	9	4	962	1	2	7	6	5	2	1
29	Vellapatti	962	385	195	190	543	0	219	131	881	165	636	9	232	124	107	187	920	534	2	6	48	6	61	153
			4	4	0			9	8	5	5		4	4	7	7	8		2	6				0	0

FIGURE 3.26 OCCUPATIONAL PATTERN OF THE STUDY AREA

3.6.7 EDUCATIONAL FACILITIES

The status of educational facilities within the study area are given in table 3.26 and represented in the form of a Pie chart in

TABLE 3.27: EDUCATION FACILITIES IN THE STUDY AREA A

S.No	Name of educational facilities	No of facilities	Government	Private
1	Pre Primary school	33	28	5
2	Primary School	35	29	8
3	Middle school	29	26	3
4	Secondary school	12	10	2
5	Higher secondary school	9	7	2
6	Degree Colleges	NIL	NIL	NIL
7	Engineering college	Nil	NIL	NIL
8	Polytechnic college	1	Nil	1

Source: District primary census handbook 2011.

3.6.8 HEALTH AND MEDICAL FACILITIES

Out of total 29 villages health & medical facilities are available almost in all villages. The statistical data representing the type and number of medical facilities available within the study area is given in Table 3.31.

TABLE 3.28: MEDICAL FACILITIES WITHIN THE STUDY AREA

S.No	Type of facility	Number
1	Primary health center	24
2	Primary health sub center	21
3	Community health center	1
4	Maternity and Child welfare center	9

Source: District primary census handbook 2011.

Besides there are plenty of private registered medical practitioners having their residential dispensaries in most of the villages.

INTERPRETATION:

In the 10KM radius only 0.05% constitutes all the mining areas. (This project contributes only 15.18ha in the total mining areas, this mining activity will have only positive impact on the socio economics of the nearby village.

In these mines about 28 persons are being employed directly and 50 persons indirectly which provides a considerable opportunity to the local community. There is no ecological sensitive zone, historical monuments are any other places of sensitivity noticed in the core and buffer zone.

3.6.9 SUMMARY OF THE BASELINE STATUS:

The interpretations of the baseline environmental status in the study area are following.

- The monitored Air quality in the mine lease area was found to be in compliance with the NAAQ norms for industrial and residential rural and other areas.
- The noise level Leq during the day and night was found to be well within the ambient noise quality standards notified under Environmental (Protection) Act 1986.
- The quality of the surface water and ground water are found well within the prescribed standards of CGWB Norms and drinking water specification IS 10500 and Central Pollution Control Board water quality criteria.
- There is no eco sensitive zone or any Archeological/ historical places found within the vicinity of the mine area.
- There are no endangered red list species of fauna and the area is thinly populated. All basic facilities like school, hospitals, communication center, transportation center, are available in and around the project area.
- There is sufficient buffer zone for the project with respect to physical and biological environments.
- There is no effluent discharge from the mine to the nearby water bodies.

4. ANTICIPATED ENVIRONMENT IMPACT AND ITS MITIGATION MEASURES

4.0 GENERAL

The purpose Impact Assessment is to identify and evaluate the potential impacts (beneficial and adverse) due to the project on the surrounding environment. It is a useful aid for decision making based on understanding of the environment implications including social, cultural and aesthetic concerns which could be integrated with the analysis of the project costs and benefits. On the basis of the impact analysis, the mitigating action and future monitoring requirement are focused in the Environmental Management Plan for counting or minimizing adverse impacts.

With the commissioning of the mining activities of the proposed project, it is expected that there shall be certain changes in the overall environmental matrix of the area. The base line data of the existing environment, in the absence of mining activities, provides the status of natural environment and when this is evaluated in conjunction with the proposed activities it further provides a mechanism for prediction of changes likely to happen. In present study likely impact and its extent on various environmental parameters like topography, drainage pattern, water, noise, air, soil, hydrology, ecological and socio-economics were undertaken by assessing the baseline environmental status of the area and estimation were made as how this will change with commencement of mining activities. The mitigation measures have been developed with a view to bring down the levels of impacts within limits. In each of the areas of impact, measures have to be taken to mitigate adverse impacts and where these are beneficial in nature such impacts are to be enhanced/augmented so that the overall adverse impacts are reduced to substantial extent

The environmental impacts caused due to the commissioning of the project can be categorized as primary (direct) and secondary (indirect) impacts. Primary impacts are those which are induced directly by the project whereas the secondary impacts are those which are indirectly induced and typically include the associated investment and changing patterns of social and economic activities due to the proposed action. Interaction of the project activities with environmental attributes is presented as Activity Impact Matrix Table below –

TABLE – 4.1: ACTIVITY-IMPACT IDENTIFICATION MATRIX

Sl. No.	PROJECT ACTIVITY	POTENTIAL IMPACT										
		LAND	AIR	WATER	NOISE	VIBRATION	SOIL	RESOURCE	BIOLOGICAL	TRAFFIC	HEALTH	SOCIO ECON
1	Drilling & Blasting	ST -ve RE	ST -ve RE	NA	ST -ve IR	ST -ve IR	ST -ve IR	NA	ST -ve RE	ST -ve RE	ST -ve RE	ST +ve
2	Movement of HEMM & Vehicles	ST -ve RE	ST -ve RE	NA	ST -ve RE	ST -ve RE	ST -ve RE	NA	ST -ve RE	ST -ve RE	ST -ve RE	ST +ve
3	Mineral Storage, Transportation and Handling	ST -ve RE	ST -ve RE	NA	ST -ve RE	ST -ve RE	ST -ve RE	NA	ST -ve IR	ST -ve RE	ST -ve RE	ST +ve
4	Waste Dump	ST -ve RE	ST -ve RE	NA	NA	NA	ST -ve RE	NA	ST -ve RE	NA	ST -ve RE	ST -ve RE
5	Site Facilities (Office, Toilets, Rest Shelter etc.,)	ST -ve RE	ST -ve RE	ST -ve RE	ST -ve RE	NA	ST -ve RE	ST -ve RE	ST -ve RE	ST -ve RE	ST -ve RE	ST +ve
6	Sewage Generation	ST -ve RE	ST -ve RE	NA	NA	NA	ST -ve RE	NA	ST -ve RE	NA	ST -ve RE	NA
7	Solid Waste Generation	ST -ve RE	ST -ve RE	NA	NA	NA	LT +ve RE	NA	ST -ve RE	NA	ST -ve RE	NA
8	Mine Closure and Plantation	LT +ve IR	LT +ve IR	LT +ve IR	LT +ve IR	NA	LT +ve IR	LT +ve IR	LT +ve IR	LT +ve IR	LT +ve IR	LT +ve IR

ST-Short Term, **LT**-long Term, **RE**-Reversible, **IR**-Irreversible, **+ve** - Potential Positive Impacts, **-ve** - Potential Negative Impacts, **NA** – Not Applicable

IMPACTS ON TOPOGRAPHY AND DRAINAGE

Topography –

The core zone i.e. the mine lease area is a part of crystalline Archaean rocks of deep seated metamorphic origin, the rocks occur in the form of long, narrow, parallel bands which are traceable over a long distance running N10⁰E – S10⁰W with Vertical dipping. The lease area is already altered due to mining activities with the formation of benches towards the inner faces and proposed mine pit well above the ground water table levels. Thus, the mining will bring change in the local topography of the lease area.

Drainage –

The mine lease area does not contain even any first order stream and thus no diversion of any stream for facilitating the mining activities is contemplated. The natural ground slope in the surrounding area of the mine is from north to south and the nearest water bodies in the area is P. Udayapatti Kulam 3.5 KM – North West, Tharagampatti Kulam 7 Km South West from Mine Site. During rains the flow of storm water and the discharge from dewatering of pit shall be diverted through garland drain towards the natural drainage. Thus, there shall not be any impact on the drainage pattern of the area which shall remain unchanged.

Change in River Course –

In the wake of the fact that the mine lease area does not have any river or even stream of first order passing through it, thus there is no occasion for altering the river course for facilitating mining. The nearest river is Kaveri 22 Km north from the mine site. There will be no change in the course of this river due to mining as the river course is mainly guided by the hydraulic gradient of surface water and the geological conditions of the bank and bed of the river, which will not undergo any change due to mining in the area.

4.1 IMPACTS ON LAND ENVIRONMENT

Change in Land Use –

The present land use of the core zone as per revenue record has been categorized as “wasteland”. The mining activity shall not lead to any change in the land use in buffer zone where no mining activities are proposed. However, due to mining out of material an Existing Pit Dimension – 155m (L) x 80m (W) x 18m (D) and proposed Ultimate Pit Dimension – 200m (L) x 92m (W) x 33m (D) with depth of about 33m from the natural surface level shall be created which will get inundated with rainfall falling in the mine. Thus, land use of about 1.00.00ha shall change from waste land to waterbody.

The total land to be affected/ degraded due to mining is about 1.84.00ha. The entire area effected due to mining would not be restored in its original form even at the end of the final closure as anticipated recovery is 60% limestone which will be sold and 40% waste & topsoil quantity at the end of mining which will be utilized for reclamation by plantation on top benches after plantation about 0.84.00ha and plantation along safety barrier, along road, on dumps, office premises about 0.28.00ha. The post mining land use pattern will be as given below –

TABLE 4.2– POST LAND USE PATTERN

Sl.No	DESCRIPTION		AREA AT THE END OF LIFE OF MINE (HA)
1	Mined out Pit	Water Reservoir Lower Benches	1.00.00
		Reclaimed Area by ways of Plantation (on top benches after backfilling)	0.84.00
2.	Waste dump		Nil
3.	Office & infrastructure		0.01.00
4.	Processing plant		Nil
5.	Mineral stack processing yard		Nil
6.	Sub grade mineral stacks		Nil
7.	Mine roads		0.03.00
8.	Areas under plantation		0.28.00
9.	Un utilized area		0.35.50
Total			2.51.50

Impact on Soil –

The mining plan envisages Open cast method Category “A” other than fully mechanized of mining with 60% Limestone recovery and 40% waste. The mining activities like mineral and waste transportation, drilling and blasting invariably results in land degradation and formation of loose soil particles which are mainly dust settled on the mining faces/bench. These dust particles are usually blown away along the wind direction and get deposited on the canopy of surrounding vegetation and agricultural crops thereby interfering with photosynthesis and other physiological activities of the green cover.

MITIGATION MEASURES

Due to the mining activities in the lease area the land use pattern will be altered. In order to minimize the adverse effects, the following control measures will be implemented:

- Top Soil will be removed and dumped separately, after the backfilling the top soil will be spread out on the backfilled area to facilitate the greenbelt.
- Retaining walls with weep hole will be constructed around the mine boundaries to arrest silt wash off.
- Construction of garland drains all around the quarry pit and construction of check dam at strategic location in lower elevations to prevent soil erosion due to surface runoff during rainfall and also to collect the storm water for various uses within the proposed area.
- Green belt development along the boundary within safety zone. The water stored in the mined out pit will be used for greenbelt.
- Thick plantation will be carried out on unutilized area, top benches of mined out pits, on safety barrier, etc.,
- At conceptual stage, the land use of mining area will change into area covered with greenbelt and water reservoir.
- Proper fencing will be carried out at the conceptual stage Security will be posted round the clock, to prevent inherent entry of the public and cattle.

IMPACTS ON CLIMATE

Wind Speed –

The wind speed in any area is dependent upon local topography and is intimately connected with the development as high and low-pressure zones. The controlling factors for the pressure changes lie much beyond the mining operation in small mining area which stands inconsequential as compared to the vast extent of a region in general. Thus, no adverse impact on the regional wind speed is anticipated due to the mining operations.

Temperature –

There shall be no felling of trees during development or mining operation on the contrary vegetal cover of the area shall improve due to proposed plantation. The mining operation due to blasting and running of mining machinery may cause a localized temperature increase which shall be moderated by the trees in the green belt. The temperature pattern is a regional behavior and is not likely to be affected by the mining activity.

Rainfall –

The trend of rainfall follows a regional pattern and is mainly governed by the south west monsoon and north east monsoon. The mining operation, therefore, is not likely to have any adverse impacts on rainfall pattern.

Humidity –

The pattern of relative humidity depends mainly on the rainfall, wind, temperature and other weather phenomenon that are regional in behavior. The mining operation is not likely to have any impact on the relative humidity in the surrounding.

4.2 IMPACTS ON WATER ENVIRONMENT

Impacts on Water Resources –**Surface Water –**

The requirement of water for drinking/domestic use, dust suppression and green belt shall be met from the rain water accumulated in the mine pit or nearby ground water resources if required (open wells or bore wells), thus there shall be no negative impact on surface water resource.

Since there is no stream or river flowing through the mine block, there is no case for either bringing any change in hydraulic regime or hydrology thereby impacting the quality of surface water. However, the surface water potential shall be reduced to the quantum of water which shall be held up / stored in inundation of the mining pit and shall undergo loss due to evaporation as well as percolation due to permeability.

Ground Water –

As the requirement of water for drinking/domestic use, dust suppression and green belt shall be met from the ground water resources if required (nearby bore well or open well / tube well), thus there shall be impact on ground water resource to the extent the water is abstracted from the ground i.e. 1 KLD.

Recharge to Ground Water –

The mining pit can be construed as the recharge structure having adequate capacity for impounding run-off from monsoon precipitation. The pit cause quick recharging of the ground water through percolation. The mine pit conserve water to a greater extent since it gets filled during monsoon when the evaporation rate is about half of the potential rate (PET) in summer, as a result of which the mine pit may contain water for long duration. The district average annual rainfall is 595 mm. The lease area shall also experience the downpour. The rain water shall accumulate into the pit created during each year mine working. The pit shall act as reservoir and will help in percolation of water through rock mass having fissures/ joints in the crystalline Archaean rocks.

Impacts on Surface Water Quality –

The lease area does not have any river / stream or any other waterbody. Thus, the mining activity shall not directly impact the surface water quality. However, owing to land degradation, the loose soil particles during heavy rains can find way into the pit section of the mine due to run-off from slopes and benches. This will increase the silt rate of accumulated run-off water in the pit and also increase the silt contents of the nearby water body when being dewatered from the pit. Since the major cause of water pollution during opencast mining activities is the wash off from freshly excavated areas, the programme to prevent water pollution will be focused on controlling wash off from these areas. Adequate control measures have been taken to check, not only the wash off from the freshly excavated areas and soil erosion, but also uncontrolled flow of mine water (during monsoon) into nallahs.

Impacts on Ground Water Quality –

The mining activity has been restricted from highest elevation of the lease area is 174m AMSL to ultimate depth of the mine is 141m AMSL. The water table in the area is 40m BGL (Below ground level) during pre-monsoon and 37 m BGL (Below ground level) during post monsoon season. Thus, the level of ground water will be much lower than the deepest point of mine. In view of the fact that the mining activity does not intersect the ground water table, no impact on the quality of ground water is anticipated. Beside limestone mineral is non-toxic in nature and therefore percolated water from the pits shall not impair the ground water quality.

MITIGATION MEASURES:

- Construction of garland drains to divert surface run-off into the mining area.
- The mining in the flooded pits shall be allowed only after the water level has receded.
- Sufficient time should be allowed for settling of sediment in the pits.
- Construction of check dams / gully plugs at strategic places to arrest silt wash off from broken up area.
- Retaining walls with weep hole will be constructed around the mine boundaries to arrest silt wash off.
- The mined out pits will be converted into the water reservoir at the end of mine life. This will help in recharging ground water table by acting as a water harvesting structure.
- Periodic analysis of mine pit water and ground water quality in nearby villages.
- Domestic sewage from site office & urinals/latrines provided in ML is discharged in septic tank followed by soak pits.

4.3 IMPACTS ON AIR ENVIRONMENT

Mining Operations are carried out by opencast category “A” other than fully mechanized, the air borne particulate matter generated by mineral handling operations and transportation of mineral is the main air pollutant. The emissions of Oxides of Nitrogen (NO_x) & Sulphur dioxide (SO₂), contributed by diesel operated excavation/loading equipment and vehicles plying on haul roads are marginal. Prediction of impacts on air environment was carried out taking into consideration proposed production and net increase in emissions.

The major air pollutants due to mining activity includes:-

- Particulate Matter (Dust) of various sizes.
- Gases, such as, Sulphur Dioxide, Oxides of Nitrogen, Carbon Monoxide etc., from vehicular exhaust.
- Dust is the single air pollutant observed in the open cast mines. Diesel operating drilling machines, small amount of blasting and movement of machinery/ vehicles produce NO_x, SO₂ and CO emissions, usually at low levels. Dust can be of significant nuisance surrounding land users and potential health risk in some circumstances.

In opencast mining the different activities such as handling, transportation and storage are prone to generation of high levels of fugitive dust that may increase the levels of PM₁₀ and PM_{2.5} to high extent. The probable sources of pollution due to mining activities are shown below

TABLE : 4.3 PREDOMINANT SOURCE OF AIR POLLUTION

Sl. No.	Source	Type of Pollutant
1	Mining activity (drilling/blasting/loading/HEMM)	Particulate Matter
2	Transport of waste or soil for dumping/ backfill	Particulate Matter
3	Dumping of waste	Particulate Matter
4	Mineral Loading	Particulate Matter
5	Transportation of Mineral	PM ₁₀ , PM _{2.5} , SO ₂ , NO _x , CO

In order to assess the impact due to proposed maximum tentative production of limestone @ 60% Recovery 77,575 Ts and Anticipated Waste @ 40% 51,705 Ts on air environment due to various mining activities, impact was predicted over a radial distance of 5000 m at grid interval of 500 m around the proposed site and at various sampling locations as per layout of the mining lease area. GLC was calculated over the study area in all directions to predict combined impact of blasting, loading & unloading of mineral and movement of trucks on the haul road in the mining lease area in Cartesian coordinates (X, Y) to have better prediction of model results at various locations representing project site, human settlements, commercial area and sensitive areas as present in the study area.

Emissions Details –

Blasting, Loading - unloading and transportation of mineral and waste over the haul road, wind erosion of the exposed area and movement of HEMM will be the main polluting source in the proposed mining activities releasing Particulate Matter (PM₁₀& PM_{2.5}) affecting ambient air of the area. Fugitive dust and particulates are generated in this process. Emission during Blasting, Loading and unloading was calculated by the area sources. Transportation of the mineral by trucks operated per hour on the haul road was calculated by the area source which was combination of line sources with each truck loaded with mineral transporting over the haul road of the mining area.

Details of predicted emission during loading/unloading and transportation on the haul road, wind erosion of the exposed area and road maintenance is discussed and combined impact is predicted in the worst case scenario given as follows:

Blasting – Significant amount of PM₁₀ is released during Blasting at mining site and has high potential to release PM₁₀ for very short-term. The revised version US EPA-2008 of US, EPA: AP-42 was used in compilation of Air Pollution Emission Factors during blasting.

Loading and Unloading – US EPA, 2008, revision of emission factor for AP-42 was used to calculate emission of particulate matter released into the atmosphere during loading and unloading separately.

Haul Road – US EPA, 2006, revision of emission factor for AP-42 was used to calculate emission of particulate matter released into the atmosphere during transportation of mineral and over burden of mineral by trucks on haul road. Truck will be fully covered with tarpaulin material and emission of PM₁₀ during on the haul road will be insignificant.

ISC-AERMOD View 9.1 model was used for prediction of impact with 1-h interval meteorological data of the study period (one season – Post-monsoon data) for the assessment of GLC. With all the activities discussed above will occur simultaneously in the worst-case scenario under local meteorological condition and generating total emission of PM₁₀ is 0.1301 µg/m³.

Frame work of Computation & Model Details –

By using the above-mentioned inputs, ground level concentrations due to the mining activities have been estimated to know the incremental rise in ambient air quality and impact in the study area. The effect of air pollutants upon receptors are influenced by concentration of pollutants and their dispersion in the atmosphere. Air quality modelling is an important tool for prediction, planning and evaluation of air pollution control activities besides identifying the requirements for emission control to meet the regulatory standards and to apply mitigation measures to reduce impact caused by mining activities.

PM₁₀ was the major pollutant occurred during mining activities. Impact of area source emission was considered and prediction of impact was made on various monitoring locations in the study area due to –

- Blasting
- Loading and unloading and
- Transportation of vehicles/trucks on the haul road in the mining area.

Impact was predicted in the worst-case scenario due to combined impact of blasting, loading and unloading and emission due to transportation of vehicles on the mine on haul road of mining area and other mining activities will occur simultaneously.

INPUT DATA

Sl. No.	Description	Unit	Value
1	Maximum mineable Resource	Tonnes per Annum	1,29,262
2	Tonnage of Truck	Tonnes	20
3	No. of Operational Days	Days	264

MITIGATION MEASURES

Mitigated measures suggested for air pollution controls are based on the baseline ambient air quality of the area. From the point of view of maintenance of an acceptable ambient air quality in the region, it is desirable that air quality is monitored on a regular basis to check compliance of standards as prescribed by regulatory authorities. In case of non-compliance, appropriate mitigated measures need to be checked.

The following additional measures will also be adopted such as,

- Water spraying on mine faces to control dust emission from loading and handling operations
- Dust generation will be reduced by using sharp teeth of shovels.

-
-
- Wet drilling will be carried out to contain the dust.
 - Controlled blasting techniques will be adopted.
 - Water spraying on haul roads, service roads and overburden dumps will help in reducing considerable dust pollution.
 - Cabins for shovel and dumpers and dust masks to workmen will be provided.
 - Transport of Limestone in trucks covered with tarpaulin.
 - The mine pit water can be utilized for dust suppression in and around mine areas.
 - Information on wind direction and meteorology will be considered while planning, so that pollutants, which cannot be fully suppressed by engineering technique, will be prevented from reaching the nearby agriculture area.
 - Comprehensive green belt around overburden dumps has to be carried out to reduce to fugitive dust emissions in order to create clean and healthy environment.
 - Regular maintenance of vehicles shall be carried out in order to control emissions and all vehicles shall have valid PUC
 - Ambient Air Quality Monitoring will be conducted on regular basis to assess the quality of ambient air.

4.4 IMPACT DUE TO NOISE & VIBRATION

A cumulative effect of mining activities generates enormous noise and vibration in the mining area and its surrounding areas. Prolonged exposure to high noise levels over a period of years invariably causes permanent damage to the auditory nerve and/or its sensory components. Their reversible damage, commonly referred as noise induced hearing loss (NIHL), is the commonest occupational diseases amongst the mine workers especially at such mining sites which have multiple noise sources. Besides this the fauna of surrounding area is also affected by noise as the wildlife is more sensitive to noise and vibration than the human beings.

Noise Due to Drilling –

The drilling is carried out by Jack Hammer Drills with air compressor. The noise standards prescribed by Occupational Safety and Health Administration (OSHA) for 8-hour exposure i.e. 90 dB (A) and The Director General of Mines Safety (DGMS) - India has defined the maximum allowable daily noise exposure as 90 dB (A) in an eight-hour shift with unprotected ears via their

Circular No-DG (Tech)/18, 1975[6]. Mining shall be carried in a shift of 8 hours and the equivalent noise level exposure during the shift shall be maintained less than the safety limit of 90 dB (A) by providing ear muffs to workmen.

Noise due to Blasting –

Blasting generates instantaneous and impulsive noise and is site specific dependent on many factors like the dimension of the holes, type and quantity of explosive i.e. charge/delay and degree of stemming in the hole. At the blast site with the given diameter of holes and their pattern, the noise levels are expected to be in the range of 120-130 dB (A) and tend to decrease with increase in distance of receptor. As the blasting in the mine is envisaged over a fixed time period in a day and each block allotted an assigned time slot the blasting is considered to last for 5-10 minutes depending on the charge. The noise levels over this time would be instantaneous and short in duration thus implying that impact on noise levels from blasting are not of concern.

Noise due to excavation and transportation –

Noise generated at the mine is mainly due to truck movements within and outside the ML area. The truck movement inside the ML area will be from tippers carrying wastes from the pit to the dumps. The noise generated from these vehicles will dissipate within the mine. The tippers travelling outside with mineral will have an impact on the noise level on the settlements along the road.

Impacts Due to Ground Vibration (due to blasting) –

The ground vibrations, noise and fly rock constitute the chief environmental impact of blasting. When an explosive charge detonates the chemical reaction takes place and the chemical energy is converted into shock and gas energy thereby setting prolific dynamic waves around the blast hole mainly brought by sudden acceleration of stationary rock mass. While a small portion of energy liberated during blasting is consumed in fragmentation of rock mass and fly rock apart from dissipation through ground vibration and air over pressure (noise) heat and light. The ground vibration sets the ground in transverse, longitudinal and vertical direction and which in turn causes the foundation of structure to vibrate in these directions and damage the structures.

Air overpressure is transient impulse which traverses through the atmosphere and is both audible and inaudible and has the energy to vibrate a structure and is much of concern. This is mainly manifest as energy released from unconfined explosive usage such as too small burden,

insufficient stemming length, incorrect drilling etc., which are controllable if properly addressed by the blaster.

The fly rock comes from face and top of bench and is often associated with improper blast design, inadequate burden, insufficient and ineffective stemming, and wrong blast-hole sequence. Sometimes it is caused when the explosive energy is rapidly vented through a plane of weakness in the rock. Thus, it is also controllable if properly addressed by the blaster

Ground vibrations are acoustic waves that propagate through rocks. Although the difference in accelerations, amplitude, particle velocities and the frequencies in their direction result into damage to structures but the peak particle velocity and frequency are normally taken into consideration for evaluating the structural response. The various aspects of ground vibration triggered by open cast blasting and consequent-damaging effects on different types of structures is usually computed based on the value of the Peak Particle Velocity (PPV) induced at the foundation of the distant structure. PPV criteria are considered the best predictor for ground vibration caused by blasting. It takes into consideration the total energy of ground motion induced around a blast and is a function of the distance of the location of blast from the gauge point and quantity of explosive per blasting. The PPV is worked out based on various empirical formulas. In the present case, the PPV has been worked out based on following empirical equation.

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

Where

V = peak particle velocity (mm/s)

K = site and rock factor constant

Q = maximum instantaneous charge (kg)

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

R = distance from charge (m)

Typical K factors –

Free face – hard or highly structured rock	500
Free face average rock	1140
Heavily confined	5000

Permissible Peak Particle Velocity (PPV) at the foundation level of structures in mining areas in mm/sec

Type of Structure	Dominant Excitation Frequency		
	<8 Hz	8 – 25 Hz	>25 Hz
A) Buildings/structures not belonging to the 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) Buildings belonging to owner with limited span of life			
Domestic houses/structures (Kuchha brick and cement)	10	15	25
Industrial buildings (RCC & framed structures)	15	25	50

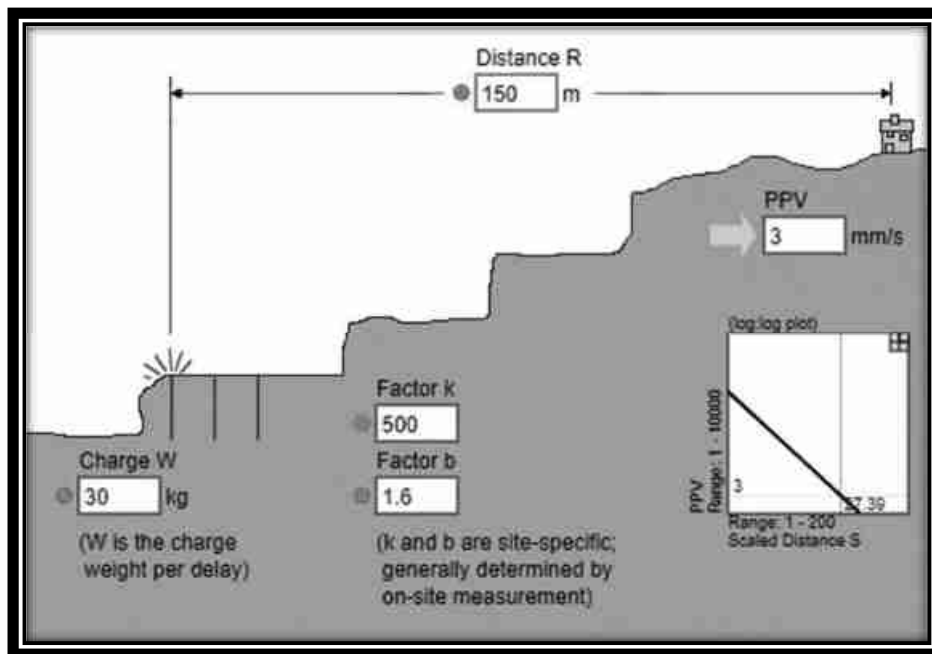
Source: DGMS Circular No. 7 dated 29/08/1997

Dominant excitation frequency in blasting in mining is generally observed to be more than 8 Hz. The Peak Particle Velocity Calculated for the proposed project with nearest house at 137 meters is –

$$V = 500[150 / (30)^{0.5}]^{-1.6}$$

$$V = 3 \text{ mm/s}$$

Thus, it can be seen that there will not be any significant impact of ground vibration due to blasting in mine on the nearby residential houses.



In order to minimize vibration, the following shall be adopted:

- Care shall be taken to ensure that effective burden is not excessive, and the face shall be kept sufficiently long.
- Optimum charge per delay shall be kept as low as possible.
- Adoption of two row blasting and V pattern of firing

- The firing of maximum possible no. of blast holes towards free face.
- Use of milli-second delay detonators between the holes and rows of blasting

MITIGATION MEASURES

The following control measures will be adopted to keep the ambient noise levels below permissible limits 90 dB (A).

- Periodic maintenance of machinery, equipment's will be ensured to keep the noise generated at minimum.
- Development of thick green belt around mining area and haul roads to reduce the noise.
- Provision of earplugs to workers exposed to high noise generating activities. Workers and operators at work site will be provided with earmuffs.
- Conducting periodical medical checkup of all workers for any noise related health problems.
- Proper training to personnel to create awareness about adverse noise level effects.
- Periodic noise monitoring at suitable locations in the mining area and nearby habitations to assess efficacy of adopted control measures.
- During the blasting, optimum Spacing, Burden and charging of holes will be made under the supervision of competent qualified mines foreman, Mate as approved by Director of Mines safety.

4.5 IMPACTS ON BIOLOGICAL ENVIRONMENT

Impact on Flora –

The proposed mine lease area is in Thennilai village, which bears negligible density and species composition of forest vegetation. There no important plants species in the buffer zone of the project and have very remote chance of getting disturbed due to mining activities. Since there will be no felling of trees or deforestation, there will be no impact on flora of the core zone. The mining activity shall not lead to any impact on the terrestrial flora of the buffer zone either. There are no national parks, sanctuaries, notified biospheres, Tiger/Elephant Corridors, Birds migratory routes, etc. within 10 Km radius.

The dust is the only major pollutant, which will be generated from different activities of mining. The effect of particulate matter on vegetation is in the form of incrustation, plugging of stomata, and loss of chlorophyll and reduction of photosynthesis process. Disturbance in plant metabolism due to deposition of dust particles on foliar surfaces leads to reduction in plant growth. The atmospheric concentrations normally do not reach a level sufficient to induce acute injury.

The annual plantation, within the mine lease area, proposed for five years of mining period shall greatly help in developing a good vegetal cover and eventually attract micro fauna, birds etc.

in the area. Thus, there will be positive impact on terrestrial environment around the mine lease area.

Measures for Minimizing Impact on Flora

- Green Belt shall be properly designed in consultation with the forest department. Plantation shall be carried out as per periodical plantation programme.
- Fast growing native plant species, medicinal value plant species, dust tolerant and sound receptor plant species and fruit species to enhance the food availability for wildlife and those which would maintain the regional ecological balance, soil and hydrological conditions shall be favoured.

Impact on Fauna –

The adverse impacts on fauna would be mainly due to human activity, noise, land degradation and deforestation etc. The impact on the fauna of the study area due to the mining activity will be marginal. The fauna is less in occurrence in the study area. There is No National Park or any eco sensitive zone or No wildlife protected area declared protected under “Wildlife (Protection) Act 1972” located within 10 KM radius of the proposed mining area. Progressive plantation with over a period of time will create conditions favorable for fauna.

Measures for Minimizing Impact on Fauna –

Following measures will be adopted to minimize the impact of mining on faunal environment of the area

- Progressive afforestation will create favorable conditions and good habitat for fauna in the area.
- Measures shall be adopted to curb pollution due to air, water, land and noise environment.

Impact on Aquatic Ecology –

There is no major water body in proposed mine area. Nearest water bodies in the area is P. Udayapatti Kulam 3.5 Km – North West and Tharagampatti Kulam 7 Km South West from the mining area. The aquatic fauna in these water bodies is not of major importance. Check dams, garland drains, retaining walls all around the waste dumps will be provided to arrest the suspended solids generated due to soil erosion and from waste dumps. Further due to the plantation proposed on the waste dumps, there will be reduction in soil erosion. Hence, no impact is envisaged from the proposed mining operations on aquatic bodies around the mine lease area.

MITIGATION MEASURES:

- Development of gap filling saplings in the safety barrier left around the proposed area.
- Carrying out thick greenbelt with local flora species predominantly with long canopy leaves on the inactive mined out upper benches.
- Development of dense poly-culture plantation using local flora species in the mining area at conceptual stage.
- Adoption of suitable air pollution control measures as suggested above.
- Transport of Limestone in trucks covered with tarpaulin.
- Construction of garland drains and settling tank to arrest silt wash off from ML area.
- Construction of retention walls around lower boundary of mining area to arrest silt wash off and roll down boulders.
- Retaining walls with weep hole will be constructed around the mine boundaries to arrest silt wash off.

4.6 IMPACT ON SOCIO ECONOMIC ENVIRONMENT

The entire mine lease area lies within the revenue wasteland; the project does not involve any loss of agriculture land. Some of the impacts would be directly beneficial to the socio-economic environment due to proposed employment potential.

The beneficial impacts due to the activities in the region would be:

- Employment Potential for 28 persons in the various categories as skilled/semi-skilled/unskilled for carrying out mining activities. Preference in employment shall be given to the locals.
- The mining machinery owned by the locals shall be also deployed.
- Indirect employment in transport sector.
- Amelioration of the general living standards of local persons employed in mining activities.
- Improvement in the economic growth in the region by way of additional mineral availability.
- Various activities, such as livelihood and entrepreneurship through providing training in self-employment and empowering women through education and training and promoting their SHG (Self Helping Group), taken under corporate social responsibility initiative will have a positive impact on socio economic fabric of the area.
- Benefit to the State and the Central governments through financial revenues by way of royalty, GST etc. from this project directly and indirectly.

The adverse impacts on socio-economic environment due to mining activities in the region will be:

- Dust will affect to the local air environment and this dust will settle down on nearby agricultural fields and will affect the productivity of the land and increase in respiratory problems.
- Soil erosion and loss of fertility etc.
- There may be some conflict of utilization of local resources between project proponent and local communities.
- Contamination of soil and air due to mining.
- Increased use of existing public infrastructure i.e. road due to vehicular traffic involved in transportation of minerals may cause congestion on roads. However, the state highway and the national highways in the district in general have been designed keeping in view the futuristic vehicular traffic.

CSR ACTIVITIES CARRIED OUT SO FAR BY THE PROPONENT.

- ❖ Providing note books to the students.
- ❖ Supplying hospital beds to the Thennilai PHC.
- ❖ Drinking water facility to the government school.
- ❖ Maintenance of public road.
- ❖ Cultural activities for the community.

CSR ACTIVITIES PROPOSED TO BE CARRIED OUT.

With reference to the above subject, the Socio – Economic assessment study was carried out to identify Corporate Environmental Responsibility (CER) for Thennilai limestone mines.

The identified CER activities are given below:-

The CER cost works out around Rs 5,00,000/- the proponent intends to carryout the following CER activities to the nearby Government School during the remaining period.

S.NO	DESCRIPTION	AMOUNT IN RS
1	Renovation of Existing toilet	Rs 5,00,000/-
2	Providing Environmental relate books to school library	
3	Carrying out plantation in the School Ground	

4.7 WASTE MANAGEMENT AND MITIGATION MEASURES.

The waste anticipated in the mines is Mineral rejects and side burden; the waste will be dumped in the pre-determined places approved by Indian Bureau of Mines and Proposed to backfilled. The entire Limestone is transported to the needy cement industries. Natural Slope is proposed waste dump to prevent soil erosion into the mine pit and other areas.

Domestic sewage from site office & urinals/latrines provided in ML is discharged in septic tank followed by soak pits.

The small quantity of spilled out and fly rocks of limestone during production will be collected manually and cleared periodically.

4.8 MINE CLOSURE AND MITIGATION MEASURES

After complete exploitation of the limestone mineral from the lease area, the lower benches in the mined out pit will be allowed to collect the rain water which will act as a temporary reservoir, this temporary storage of water will act as an artificial recharge pond which will enhance the near ground water level and the static level of the nearby wells and the top benches will be backfilled and greenbelt activities will be carried out.

Barbed wire fencing will be constructed along the lease boundary to prevent inherent entry of public and cattle's. Watchman will be appointed in the entrance to prevent inherent entries. The water in the mined out pits will be used for maintenance of greenbelt. The temporary mine office complex will be demolished and restored to original ground profile. The soak pits will be filled with sand to avoid degradation. Native species will be planted as much as possible in the left out area during the conceptual stage, as vegetation cover is the best long term method of stabilizing the site.

The closure of the mine will be in accordance to the final mine closure plan approved by the Indian Bureau of Mines. The proponent is instructed to obtain final mine closure certificate from the Indian Bureau of Mines and fulfill all the statutory condition stipulated by the MoEF during the mine closure.

5. ANALYSIS OF ALTERNATIVE (TECHNOLOGY & SITE)

5.0 INTRODUCTION:

The mining of minerals is site specific in nature and the location of the project is restricted to geology and mineral deposition of the area unlike other projects such as industries this mining project cannot be shifted to other site. The project is project is site specific and no alternate sites are proposed. The mine lease area is in operation since 1998. There is no ore beneficiation, mineral processing proposed in the project. The limestone is sold to the needy customers in the raw form after the manual grade separation.

No workshops, housing, colonies are proposed within the project area. The workers are being employed from the nearby community villages. Hence there is no requirement of selection of alternates.

5.1 ANALYSIS OF ALTERNATIVE TECHNOLOGY

Safety, economic and technical constraints determine the mining methods to be deployed. There are no changes in the method of mining and technology using in this mining operation. The mode of operation will be carried out as per the Mining plan and scheme

6. ENVIRONMENTAL MONITORING PROGRAMME

6.1 INTRODUCTION

Regular monitoring of environmental parameters is of immense importance to assess the status of environment during project operation. With the knowledge of baseline conditions, the monitoring program will serve as an indicator for any deterioration in environmental conditions due to operation of the project, to enable taking up suitable mitigation steps in time to safeguard the environment.

6.2 ENVIRONMENTAL MONITORING:

Monitoring is important to measure the efficiency of control measures. An environmental impact assessment study is carried over for a specified period of time and the data cannot bring out all variations induced by the natural or human activities. Therefore, regular monitoring program of the environmental parameters is essential to take into account the changes in the environmental quality.

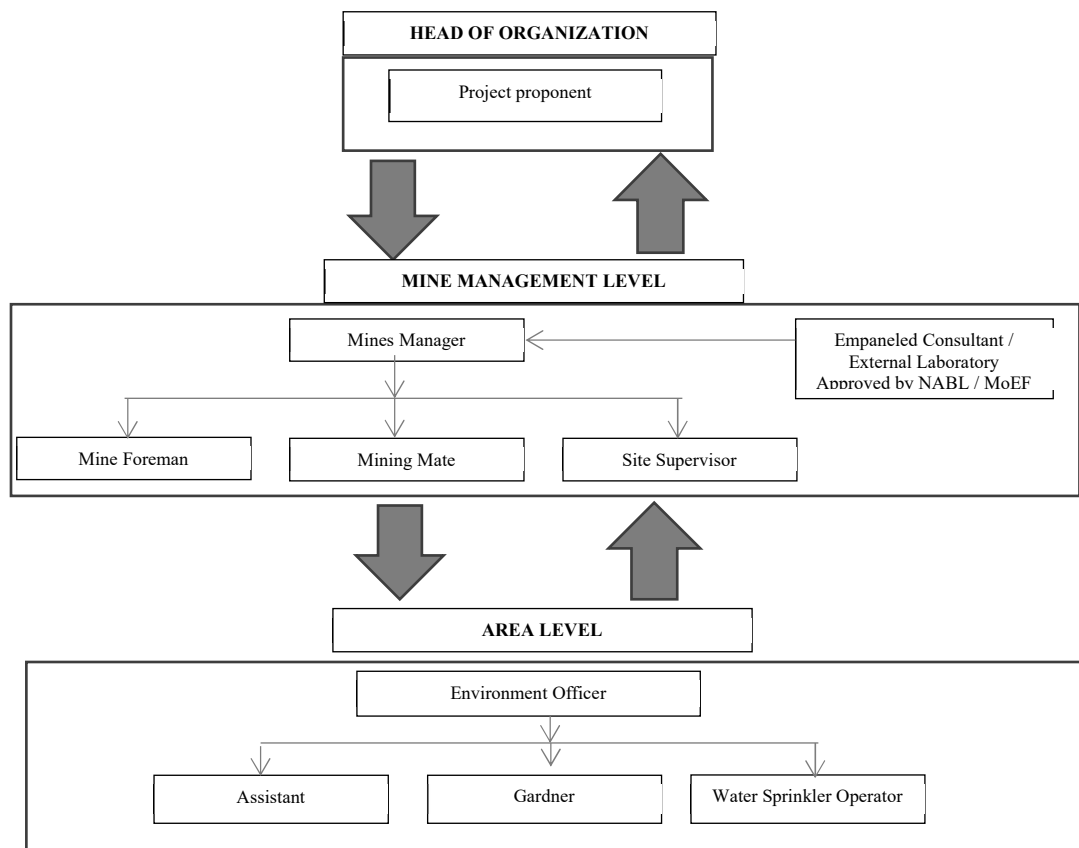
TABLE 6.1: PROPOSED ENVIRONMENTAL MONITORING PROGRAM CONDUCTED IN THE AREA

S. No.	Environment Attributes	Location	Monitoring		Parameters
			Duration	Frequency	
1	Air Quality	2 Locations (1 Core & 1 Buffer)	24 hours	Once in 6 months	Fugitive Dust, PM _{2.5} , PM ₁₀ , SO ₂ and NO _x .
2	Meteorology	At mine site before start of Air Quality Monitoring & IMD Secondary Data	Hourly / Daily	Continuous online monitoring	Wind speed, Wind direction, Temperature, Relative humidity and Rainfall
3	Water Quality Monitoring	2 Locations (1SW & 1 GW)	-	Once in 6 months	Parameters specified under IS:10500, 1993 & CPCB Norms
4	Hydrology	Water level in open wells in buffer zone around 1 km at specific wells	-	Once in 6 months	Depth in bgl
5	Noise	2 Locations (1 Core & 1 Buffer)	Hourly – 1 Day	Once in 6 months	Leq, Lmax, Lmin, Leq Day & Leq Night
6	Vibration	At the nearest habitation (in case of reporting)	–	During blasting Operation	Peak Particle Velocity
7	Soil	2 Locations (1 Core & 1 Buffer)	–	Once in six months	Physical and Chemical Characteristics
8	Greenbelt	Within the Project Area	Daily	Monthly	Maintenance

6.3 ENVIRONMENTAL MONITORING CELL

An Environmental Management Cell (EMC) will be established under the control of managing director and mines manager. A statutory competent qualified person will be appointed, for looking after the environmental monitoring and compliance with the conditions stipulated in the Environmental clearance for the mines. The environmental monitoring program will be carried out by external agency approved by MoEF/TNPCB and NABL for conducting the monitoring. The non compliance of the condition stipulated in the Environmental clearance will be periodically supervised by the Managing director of the company.

The hierarchy of EMC is shown below:



The responsibilities of EMC will be as follows:

1. Implementation of pollution control measures as suggested in Environmental Management Plan
2. Conducting Environmental monitoring as per EMP through external laboratories approved by MoEF/TNPCB and NABL.
3. Seeking experts guidance, as and when required.
4. Conducting CSR and CER activities in nearby villages.
5. Implementation of training program for occupational health and safety of workers as directed by the Director General of Mines safety.

6. The Environmental Engineer along with statutory persons like mines manager, Mining engineer, Geologist and foreman will be responsible for regular monitoring and the same will be reported to the lessees.
7. The mining engineer and geologist will be held responsible to carry out the mining operation as per the plan approved by the Indian bureau of mines and to comply with the statutory standards stipulated by the Director of Mines safety, labour enforcement officer, state pollution control board and the Department of Geology and Mining.

The Mines manager will implement the green belt development as per the approved mining plan and besides in consultation with the managing director will submit periodical status report to

1. MoEF & CC – Half yearly status report
2. TNPCB - Half yearly status report
3. IBM quarterly, half yearly annual reports

Besides the Mines manager or mine agent will submit the periodical reports to

1. Director of mines safety,
2. Labor enforcement officer,
3. Controller of explosives as per the norms stipulated by the department.

6.4 OCCUPATIONAL HEALTH AND SAFETY:

As per the guidelines of the Mine Rules 1958, occupational health safety stipulated by the ILO/WHO. The management will take all necessary precautions. Normal sanitary facilities provided within the lease area. The management will carry out periodic health checkup of workers.

Occupational hazards involved in mines are related to dust pollution, noise pollution, blasting and injuries from moving machineries & equipment and fall from high places. DGMS has given necessary guidelines for safety against these occupational hazards. The management will strictly follow these guidelines.

All necessary first aid and medical facilities will be provided to the workers. The mine will be well equipped with Personal Protective Equipment (PPE). Further all the necessary protective equipment's such as helmets, safety goggles, earplugs, earmuffs, etc. will be provided to persons working in mines as per Mines Rules. All operators and mechanics will be trained to handle fire-fighting equipment's.

7. ADDITIONAL STUDIES

7.0 GENERAL

Application to The Member Secretary of the Tamil Nadu Pollution Control Board (TNPCB) to conduct Public Hearing in a systematic, time bound and transparent manner ensuring widest possible public participation at the project site or in its close proximity in the district is submitted along with this Draft EIA / EMP Report and the outcome of public hearing proceedings will be detailed in the Final EIA/EMP Report.

7.1 PUBLIC CONSULTATION:

As the mining operation were carried out after 15.01.2016 (SO No 141 (E) Dated: 15.01.2016) the project attracts violations as per the Notification No S.O No 804 (E) Dated: 14.03.2017 and subsequently as per the notification 1030 (E) Dated: 08.03.2018 the B category projects were re directed by MoEF & CC to be appraised in the respective State Environment Impact Assessment Authority (SEIAA).

The proposal was placed before the 106th SEAC – TN meeting held on 05.04.2018. Based on the document furnished, the committee observed that the project falls under the category B1 and schedule 1(a) of the EIA Notification, 2006.

As per the Ministry of Environment, Forest and Climate Change (Impact Assessment Division) Office Memorandum F.No.22-28/2020-IA.III Dated 12.11.2020 Public Hearing is not required for this project since the Extent of the mine is > 5Ha and as per the MoEF & CC Notification 2269 (E) Dated 01.07.2020 The project is not falls under cluster situation.

7.2 RISK ASSESSMENT

Risk assessments will help the mine operators to identify high, medium and low risk levels. Risk assessments will help to prioritize risks and provide information on the probability of harm arising and severity of harm by understanding the hazard, combine assessments of probability and severity to produce an assessment of risk and it is used in the assessment of risk as an aid to decision making.

Risk assessment is a process whereby risks are analyzed, assessed and risk management priorities are evaluated. It is defined as the characterization of the potential adverse effect to human health & environment due to environmental hazards.

7.2.1 OBJECTIVES OF RISK ASSESSMENT

- Review of literature on Hazard Identification and Risk Assessment

- Review of accidents in mines and their analysis.
- Study of risk assessment methodologies.
- Application of Hazard Identification and Risk analysis for improvement of workplace safety in mines.

7.2.2 METHODOLOGY OF RISK ASSESSMENT:

- Collection of information & identification of hazard
- Classify their severity and probability of occurrence
- Identification of exposed risks
- Assess the risk and risk rating based on
 - * Probability
 - * Exposure
 - * Consequence
 - * Prioritization of the risks
 - * Implementation of control measures
 - * Monitoring risk assessment
 - * Evaluation and correction



Factors of risks involved due to human induced activities in connection with mining operations are

1. Stability of Topsoil Bench
2. Drilling
3. Blasting
4. Excavation of mineral
5. Transportation of mineral

Other risk factors due to natural activities are

1. Fire due to oil spillage
2. Water inundation and
3. Natural Calamities.

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

TABLE 7.1: ANALYSIS OF CAUSES AND CONTROL MEASURES

S.NO	FACTORS	CAUSES OF RISKS	CONTROL MEASURES
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1.	Stability of Topsoil Bench	<ul style="list-style-type: none"> • Topsoil bench may slide due to its unconsolidated nature. • Vibration due to movement of HEMM. 	The top soil bench is about 1m which will not have any impact.
2.	Drilling	<p>A) Due to high air pressure, air hoses may burst.</p> <p>b) Wear and tear of drill rods.</p>	Periodic Maintenance of worn out accessories of the compressor and drill equipment's will be replaced.
3.	Blasting	<p>a Fly rock, ground vibration and noise etc.,</p> <p>b Improper charging of explosives.</p>	Controlled blasting technique will be implemented.
4.	Excavation of Mineral	<p>a. Hauling and loading equipment are in close proximity while excavation.</p> <p>b Swinging of bucket over the body of tipper.</p> <p>C Driving of un authorized person.</p>	<p>Operator shall not operate the machine when person & vehicles are in such proximity.</p> <p>Shall not swing the bucket over the cab and operator leaves the machine after ensuring the bucket is on ground.</p> <p>Shall not allow any unauthorized person to operate and maintain the excavator.</p> <p>Induction training specified by the excavators manufacturers will be provided</p>
5.	Transportation of Ore	<p>a Operating the vehicle nose to all</p> <p>b Overloading of material</p> <p>c While reversal & overtaking of vehicle</p> <p>d Operator of truck leaving his cabin when it is loaded.</p>	<p>It will be ensured that all these causes will be minimized by giving training to the operators</p> <p>No over loading</p> <p>Audio visual reserve horn will be provided</p>
6.	Fire due to electricity and Oil	a Due to the short circuit of cables & other electrical parts,	Since we propose to operate the mine in day time only, and no illumination is required hence the risk related to Electricity will not arise. For Dewatering it is proposed to use Diesel Drive Pumps.
7.	Water inundation	<p>a Inrush of storm water due to heavy rain.</p> <p>b Unusual seepage of water from river side</p> <p>d Sudden collapse of peripheral bund due to torrential pour</p>	<p>Guard will keep a continuous watch on water level and shall immediately inform to the mine officials when it approaches the danger mark.</p> <p>Withdraw all the persons from the mine via shortest route in an orderly manner</p> <p>Work shall not be resumed except with the prior permission of the Manager unless all the working places are thoroughly examined by a competent person.</p>
8.	Natural calamities	Unexpected happenings like earth quakes/ land slides	There is no record in the past history of any natural calamities.

7.3 DISASTER MANAGEMENT PLAN

The disaster management plan is aimed to ensure safety of life, protection of environment, protection of installation, restoration of production and salvage operations in this same order of priorities. For effective implementation of the disaster management plan, it should be widely circulated and personnel training through rehearsals/drills.

OBJECTIVE –

- Effect the rescue and medical treatment of casualties;
- Safeguard other people;
- Minimize damage to property and the environment;
- Provide authoritative information to the personnel
- Secure the safe rehabilitation of affected area; and
- Preserve relevant records and equipment for the subsequent inquiry into the cause and circumstances of the emergency.

EMERGENCY ORGANIZATION (EO) –

It is recommended to setup an emergency organization. A Mines Manager who has control over the affairs of the mine would be heading the emergency organization. He would be designated as site controller. The mines manager shall appoint the Incident Controller (IC). The incident controller would be reporting to the site controller. Incident controller, for him-self, organizes a team responsible for controlling the incidence with the personnel under his control.

Emergency coordinator's would be appointed who would undertake the responsibilities like firefighting, rescue, rehabilitation, transport and provide essential and support services. For this purposes, Security in-charge, personnel department, essential services personnel would be engaged. All these personnel would be designated as key personnel.

EMERGENCY COMMUNICATION (EC) –

In all the mine workers whoever notices an emergency situation such as fire, growth of fire etc., would inform his immediate superior and Emergency Control Center (ECC). The emergency control center would appraise the site controller. Site Controller verifies the situation from the incident controller of that area takes a decision about an impending on site emergency. This would be communicated to the incident controller, emergency coordinator. Simultaneously, the emergency warning system would be activated on the instructions of the site controller.

EMERGENCY RESPONSIBILITIES –

The responsibilities of the key personnel are appended below:

Site Controller –

Duties and responsibilities of site controller during emergency –

- Assesses the magnitude of the situation on the advice of incident controller and decides;
- Whether the affected area needs to be evacuated;
- Whether personnel who are at assembly points need to be evacuated;
- Declares Emergency and orders for operation of emergency siren;
- Organizes announcement by public address system about location of emergency;
- Assesses which areas are likely to be affected, or need to be evacuated or are to be alerted;
- Informs the statutory authorities;
- Keeps record of chronological events and prepares an investigation report and preserves evidence; and
- On completion of On Site Emergency and restoration of normalcy, declares all clear and orders for all clear warning.

EMERGENCY FACILITIES –

Emergency Control Center (ECC): The Mine Office Block is identified as Emergency Control Center. It would have external Telephone, Fax, and Telex facility. Site Controller/ Incident Controller Officer, Senior Personnel would be located here. Also, it would be an elevated place. The following information and equipment are to be provided at the Emergency Control Center (ECC):

- Intercom, telephone;
- Fire suit/gas tight goggles/gloves/helmets;
- Hand tools, wind direction/velocities indications;
- Public address megaphone, hand bell, telephone directories;
- Mine layout, site plan;
- Emergency lamp/torch light/batteries;
- Plan indicating locations of hazard inventories, sources of safety equipment, work road plan, assembly points, rescue location vulnerable zones, escape routes;
- Emergency shut-down procedures;
- Nominal roll of employees;

-
- List of key personnel, list of essential employees, list of Emergency Coordinators;
 - Important address and telephone numbers including Government agencies, neighboring industries and sources of help, outside experts, population details around the Mine.

Assembly Point –

Number of assembly depending upon the mine location would be identified wherein employees who are not directly connected with the disaster management would be assembled for safety and rescue. Emergency breathing apparatus, minimum facilities like water etc. would be organized. In view of the size of mine, different locations should be ear marked as assembly points. Depending upon the location of hazard, the assembly points are to be used.

Emergency Medical Facilities –

Stretchers, and general first aid materials for dealing with chemical burns, fire burns etc., would be maintained in the medical center. Private medical practitioners help would be sought. Government hospital would be approached for emergency help.

First aid facilities would be augmented. Names of medical personnel, medical facilities in the area would be prepared and updated. Necessary specific medicines for emergency treatment of burns patients and for those affected by toxicity would be maintained.

Emergency Coordinator – Rescue, Fire Fighting

Objective:

To deal with Fire efficiently and quickly at different location of Mine including HEMM.

Source of Fire:

- HEMM
- Oil & Lubricant Room
- Diesel Pump/storage area

Action Plan:

1. Whoever notices any sign of fire shall give warning signal to seek assistance and also immediately take steps to give warning by blowing the siren continuously and take steps to extinguish the fire by using appliances available near the site.
 2. Duties of Mine officials
 - a. Inform the fire station to send the firefighting team
 - b. Alert the security to prevent unauthorized entry.
 - c. After giving information, reach the spot, remove Man & Machinery and take steps to tackle the fire in accordance with the firefighting instructions. Inform at security office to get Ambulance if required.
 - d. On receiving warning the Mines official/ team shall reach the site of fire and depending on its nature, class and extent shall take steps to extinguish it and rescue persons if involved in fire.
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- e. Supervise the firefighting operation and make necessary arrangement for medical aid to affected person, if any.

Accident due to Heavy Earth moving machineries and dumpers

In the mine site action due to the movement of Heavy Earth moving machineries and dumpers may occur the following action plan is to be taken.

Action Plan:

- i. Vehicle brakes & steering test will be done regularly as per DGMS circular.
- ii. Dumper operators are selected very carefully & given a thorough initial training. Periodical refresher training & examinations is been organized to test their skills & attitudes.
- iii. Unauthorized driving of machinery is strictly prohibited.
- iv. All curves in haul roads are designed with a large radius so that the driver has a clear view for a distance of not less than 30m along the road
- v. A special road maintenance group is formed under a properly trained foreman.
- vi. Traffic rules specifying speed limits, right of way, overtaking & parking and other general precautions are framed & strictly enforced.

Emergency Action plan on Site:

The primary purpose of the on-site emergency plan is to control and contain the incident and to prevent it from spreading to nearby area. It is not possible to cover every eventuality in the plan and the successful handling of the emergency will depend on appropriate action and decisions being taken on the spot. Other important aspects needing to be considered include the following:

a) Emergency Warning –

Communication of emergency would be made familiar to the personnel inside the mine and people outside. An emergency warning system would be established.

b) Evacuation:

Non-essential personnel will be evacuated from the incident area and also from adjacent area. Evacuation should be to a predetermined assembly point in a safe part of the works.

c) Accounting for personnel:

It is important to be able to account for personnel during an emergency. The number of workers present should always be made available. The area should be properly cordoned and exact record of movement of persons should be made, so as to know the affected persons. No un-authorized persons or visitors are allowed to enter the area.

d) Access to records:

The time office has to function properly with handy records of persons on duty. This will be necessary in order that relatives of any causality can be quickly informed

e) Co-ordination with Local Authorities –

Keeping in view of the nature of emergency, two levels of coordination are proposed. In the case of an On Site Emergency, resources within the organization would be mobilized and in the event extreme emergency local authorities help should be sought.

In the event of an emergency developing into an offsite emergency, local authority and District emergency Authority (normally the Collector) would be appraised and under his supervision, the Off Site Disaster Management Plan would be exercised. For this purpose, the facilities that are available locally, i.e. medical, transport, personnel, rescue accommodation, voluntary organizations etc. would be mustered. Necessary rehearsals and training in the form of mock drills should be organized.

f) Rehabilitation:

The rehabilitation work shall be carried out once after the emergency is over. Care is required when re-entering the incident area. The Site controller may initiate an inquiry and should be consulted regarding the collection of evidence before it is disturbed.

g) Post Disaster Analysis and Evaluation:

When the emergency is over, the team will carry out a detailed analysis of the causes of the accident, evaluate the influence of various factors and minimize them for future. At the same time, the adequacy of the Disaster Preparedness Plan will be evaluated and shortcomings will be rectified for subsequent improvement of the plan.

7.3.1 General Responsibilities of Employees during an Emergency:

During an emergency, it becomes more enhanced and pronounced when an emergency warning is raised, the workers in-charge, should adopt safe and emergency shut down and attend any prescribed duty as essential employee. If no such responsibility is assigned, he should adopt a safe course to assembly point and await instructions. He should not resort to spread panic. On the other hand, he must assist emergency personnel towards objectives of DMP.

Co-ordination with Local Authorities:

The mine manager who is responsible for emergency will always keep a jeep ready at site. In case any eventualities the victim will be taken to the nearby hospitals after carrying out the first

aid at site. A certified first aid certificate holder will be responsible to carry out the first aid at site. The mine manager should collect and have adequate information of the nearby hospitals, fire station, police station, village panchayat heads, taxi stands, medical shop, district revenue authorities etc., and use them efficiently during the case of emergency.

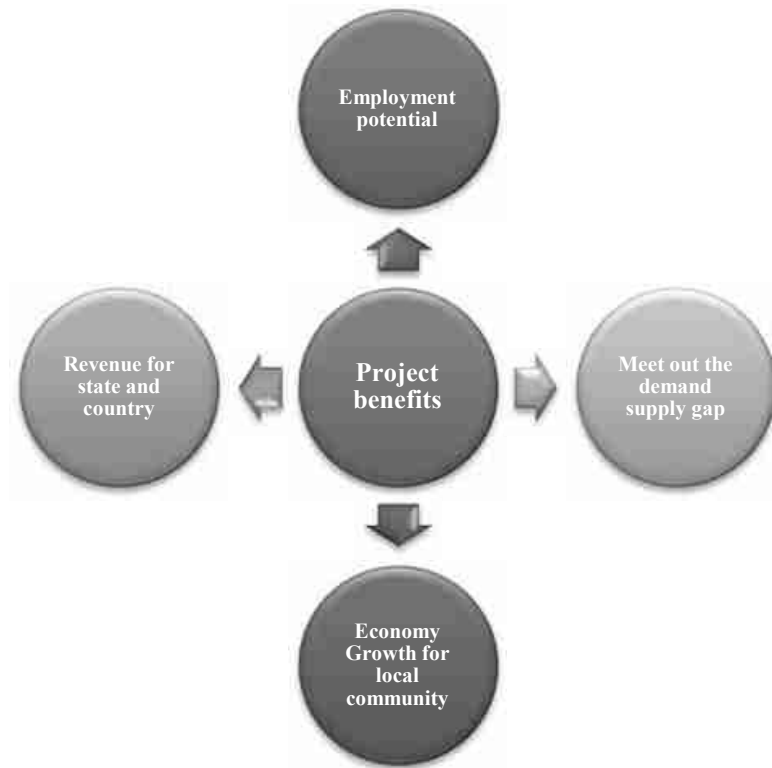
7.4 RECLAMATION AND REHABILITATION

No reclamation and rehabilitation are proposed and hence neither reclamation nor rehabilitation was carried out during the previous mining activity. Hence reclamation and rehabilitation does not arise.

8. PROJECT BENEFITS

8.1 GENERAL

Various benefits are envisaged for the mining of Limestone at Thennilai Village. The project will be beneficial and important to the Community, local & regional economy.



This chapter gives a comprehensive description of various advantages and benefits anticipated from the project to the locality, neighborhood, region and nation as a whole. Lime stone is very important chemical mineral and is the principal raw material for the production of soda ash and clinker for cement, etc., the need for mining of the chemical grade limestone from the project (mine lease area) has arisen to meet the current situation of demand supply gap faced by the proponent.

8.2 PROJECT BENEFITS

Physical and Social infrastructure to the Community

- Improved road communication,
- Strengthening of existing community facilities through the existing Community Development Program.

- Mine pits will be converted into rain water reservoir to augment the water availability for greenbelt development consistently.
- Greenbelt has been done in the mine area so far and lot many are proposed to mitigate the ill-effects of mining and to improve the vicinity and environment of mine and its surrounding area.
- Awareness program and community activities, like health camps, medical aids, family welfare programs, immunization camp sports & cultural activities, plantation etc.,
- Providing certain facilities for the local schools and primary health centers/eye camps.

8.3 BENEFITS TO LOCAL AND REGIONAL ECONOMY

- It will generate revenue for the State of Tamilnadu
- Royalty, DMF & GST to the Government
- CER/CSR Activities will be provided as per law.
- Direct employment to skilled/unskilled and semiskilled laborers.
- Indirect employment to local people in different activities such as transportation, food points, plantation activities, water tanker supply, hand equipment's etc.
- Generation of self-employment through self-help groups.

8.4 EMPLOYMENT POTENTIAL

The local labors shall be engaged for supervising during loading and handling of mineral in mining area, besides, watch and ward and plantation activity with proper maintenance. The total manpower required for material handling and loading works out to 26. Beside this, proponent shall engage skilled and managerial staff to meet the statutory requirement under MMR 1961 and MCDR 1988. At present, the mine is not functional. The following skilled / unskilled and semi-skilled workers besides managerial and administrative staff shall be employed at the time of re-opening of mine.

TABLE 8.1: EMPLOYMENT POTENTIAL

PRESENT EMPLOYMENT POSITION		ADDITIONAL REQUIREMENTS DURING THE MP PERIOD
Mining Engineer (Part time)	-	1
Geologist (Part time)	-	1
Skilled labour		-
Foreman	2	-
Mate cum Blaster	1	
Mines office clerk (full time)	1	
Supervisor	1	
Semi-Skilled		
Drivers	6	
Un skilled labour	15	
TOTAL	26	2

8.5 TANGIBLE SOCIAL BENEFITS

There will be positive impact in socio-economic area due to increased economic activities, creation of new employment opportunities, infrastructural development and better educational and health facilities.

Health

The proponent will undertake awareness program and community activities like health, camps, medical aids, family welfare camps, medical awareness program etc. Periodic medical checkups as per Mines Act/ Rules and other social development and promotional activities will be undertaken. All this will assist to lift the general health status and enhance the standards of the communities of the area around mines.

9. ENVIRONMENTAL COST BENEFIT ANALYSIS.

Environmental Cost benefit analysis is not recommended.

10. ENVIRONMENT MANAGEMENT PLAN

Environmental Management Plan is the key to ensure that the environmental quality of the area does not deteriorate due to the mining operations. Preparation of Environmental Management Plan is required for the formulation, implementation, and monitoring of environmental protection measures during and after commissioning of mining operations; Also to ensure that working of the project in compliance with the environmental norms and sustainable development in the study area.

The environmental management plan has been developed with a view to bring down the levels of impacts within limits as discussed in above chapters. In each of the areas of impact, measures have to be taken to reduce potentially significant adverse impacts and where these are beneficial in nature, such impacts are to be enhanced / augmented so that the overall adverse impacts are reduced to as low level as possible.

Measures in practice and to be implemented for each of the impact areas are detailed below.

AIR QUALITY MANAGEMENT –

Potential impact	Action	Parameters for monitoring	Timing
Dust Emission	Use certified drill bits for drilling holes and wet drilling shall be practiced.	Random check of equipment used for drilling	During short hole drilling.
	All equipment's are operated within specified design parameters with trained and qualified operators.	Random checks of equipment logs/ manuals	During mining operation. And maintenance stage
	Vehicle should be loaded optimum loads to minimized to the extent possible	Vehicle logs / optimum capacity of vehicle	During operational phase.
	Ambient air quality within the premises of the proposed unit to be monitored.	The ambient air quality will conform to the standards for SPM, SO ₂ and NO _x	As per CPCB and TNPCB requirement.

Controlling Measures –

- Generation of dust during excavation is minimized by regular water sprinkling on working face.
- Thick Greenbelt is developed with tall growing trees and thick foliage cover all along the boundary of the mine lease (7.5 Meter Buffer Zone) to arrest dust spreading outside the mine lease area and will continue the same.
- Proper maintenance of haul roads and regular water sprinkling to minimize the generation of air borne dust due to movement of heavy earth moving machineries on it.
- Water sprinkling at the loading and unloading points to reduce fugitive dust emissions.

- Wet drilling procedure /drills with dust extractor system to control dust generation during drilling at source itself is implemented.
- Plantation will be carried out on surface dumps, backfilled area and top benches of the mined out area.
- Water reservoir will be developed in the left over mined out pit, which will serve as additional surface water resources for the nearby villages.
- Proper maintenance of the equipment and machinery in the mines helps in minimizing air pollution and noise generation.
- Development of thick green barriers along the waste dump, infrastructure facilities, etc., to reduce the spread of air pollution in the surrounding areas.
- The village roads used for mineral transport will be regularly maintained by the company to avoid fugitive dust emissions.
- Dust mask are provided to the workers working in high dust generating areas.
- Regular and Periodic maintenance of deployed machineries, to reduce smoke emission.
- Regular Ambient Air Quality Monitoring are carried out in the mine lease area and in surrounding villages to access the impact due to the mining activities and the efficacy of the adopted air pollution control measures.

NOISE QUALITY MANAGEMENT –

Potential impact	Action	Parameters for monitoring	Timing
Noise	List of all noise generating machinery onsite along with age to be prepared. Equipment to be maintained by certified mechanics for good working order.	Equipment logs, noise reading	During mining operation.
	Implement good working practices (equipment selection and siting) to minimize noise and also reduce its impacts on human health (ear muffs, safe distances and enclosures). Adopt good blasting practices to reduce impact on flora and fauna. Muffling will be done at the time of blasting	Site working practices records, noise reading	During short hole drilling.
	Noise to be monitored in ambient air near blasting shelter and at the lease boundaries.	Noise reading	As per TNPCC/ MoEF & CC norms.
Ground vibration due to blasting	Controlled customized blasting techniques will be implemented. With the supervision of qualified blaster.	Vibrations to be Modeled and customized.	At the time of Blasting.

The following control measures are in practice for maintaining the noise levels within permissible limits:

- A thick greenbelt is made all along the Buffer Zone (7.5 Meters) of the mine lease area to attenuate the noise.
- Plantation activities will be continuously carried out on surface dumps and infrastructure facilities, these plantations will help in attenuating the noise levels.
- Preventive maintenance of mining machinery to control noise generation.
- Provision of earmuff/ ear plugs to workers working in noise prone zones in the mines.
- Provision of effective silencers for mining machinery and transport vehicles.
- Provision of sound proof cabins to HEMM.
- Sharp drill bits are used to minimize noise from drilling.
- Controlled blasting technologies are adopted by using delay detonators to minimize noise from blasting.
- Provision of noise proof enclosures to stationary machineries like DG Sets, mineral processing units etc., wherever possible, to minimize the noise propagation.
- Regular ambient noise level monitoring are carried out in the mine lease area and in surrounding villages to assess the impact due to the mining activities and the efficacy of the adopted noise control measures. Additional noise control measures will be adopted if required as per the observations during monitoring.

GROUND VIBRATION AND FLY ROCK CONTROL –

- To keep ground vibration due to blasting well within the prescribed limits of DGMS and to avoid fly rock, following measures are in practice –
- Controlled blasting using delay detonators will be carried out.
- Drilling and blasting will be carried under the supervision of qualified persons.
- Overcharging of the blast holes will be avoided.
- Muffled blasting will be practiced near the ML boundary to control fly rocks (if required).
- Blasting will be carried out only for loosening of the strata and explosive charge will be reduced to avoid fly rocks.
- Suitable spacing and burden will be maintained to avoid misfire / fly rocks.
- Number of blast holes will be restricted to control ground vibrations.
- Blasting will be carried out only during noon time.
- PPV due to blasting will be regularly monitored at nearby village habitations and the blasting parameters will be suitably changed, if required.

TRAFFIC MANAGEMENT –

Following management measures are in practice by the mine management to minimize the impacts due to the traffic from the mining associated activities –

-
- Village roads used for manpower transportation to the mine lease area will be regularly maintained by the company.
 - Regular preventive maintenance of the transportation vehicles will be carried out to control emissions.
 - Silencers of the transportation vehicles will be maintained in good conditions to avoid high noise generation.
 - Silence zones will be declared nearby village, schools, hospitals and other sensitive places.
 - Only trained drivers will be employed and all traffic rules will be strictly followed.

WATER QUALITY MANAGEMENT –

To maintain the surface and ground water quality of the area, the following control measures are in practice in the mine lease area.

- There is no process effluent generation or discharge proposed from the mine lease area.
- Surface run-off from the mine lease area will be accumulated in mine pits / settling ponds for settling and will be used for dust suppression and plantation in the mine.
- Domestic sewage generated from the mine lease area will be disposed in septic tank and soak pit system.
- Garland drains, silt traps, check bunds, gully plugs, etc., will be constructed at suitable locations in the mine lease area to arrest silt wash off.
- Retention walls and garland drains will be constructed around toe of waste dumps to arrest silt wash off from dumps during monsoon.
- Fast growing grasses, small plants and bushes will be grown on the inactive / mature overburden dumps to control soil erosion and siltation.
- Rainwater harvesting measures will be adopted in the mine lease area and in nearby villages to maintain the ground water table of the area.

SOLID WATER MANAGEMENT –

Storage and Prevention of Top Soil –

- Topsoil removed will be preserved all along the boundary barrier to facilitate greenbelt development.

Overburden Waste and Sub-Grade Mineral Management –

- Backfilling will be carried out on top benches of the mined out pit.
- The size of the backfilling area for next five years is ear-marked in Plate Nos. V & VI.
- The backfilled area shall be covered with the soil for green belt development.
- The inactive slopes of the dumps will be planted with deep rooting shrubs, grasses and creepers for stabilizing them.
- To arrest the silt and stones washing away with surface run-off during monsoon, retaining walls will be provided along the foot of the temporary surface dump.
- Surface run-off from the surface dumps and these garland drains will be diverted to the mine pits.

LAND DEGRADATION MANAGEMENT –

- At conceptual stage, the mining pits will cover 1.84.00ha of the mine lease area. Partial backfilling of the mined out pits will be carried out on top benches by waste generated during mining.
- Thick plantation using native flora species will be carried out on the backfilled area.
- The remaining mined out pits; water reservoir will be developed in the lower benches by accumulating surface run-off from the mine lease area into it.
- The top benches of the mined out pits will be planted with local flora species.
- Currently, plantation is carried out on the 7.5 meters wide green belt around the mine lease area.
- There will be formation of a surface water body in the mined out area, which can be used for pisci-culture activities.
- The water from the reservoir can also be used for irrigating the nearby agriculture lands.
- The top soil generated during mining operations and will be stored in the top soil stacks and will be used for plantation on green belt area, backfilled area, on top benches of the mined out pits etc.,
- At conceptual stage, thick vegetation will be developed on the top benches of the mined out area and greenbelt area around the mine lease boundary and a huge water reservoir will be developed in the lower benches of the mined out pits. Thus, the ultimate reclamation planned will be congenial to the surrounding environment and will improve the aesthetics of the area.

BIOLOGICAL ENVIRONMENT MANAGEMENT –

The mine management will take all necessary steps to avoid the impact on the ecology of the area by adopting suitable management measures in the planning and implementation stage. During mining, thick plantation will be carried out around the mine lease periphery, on safety barrier zone, on top benches of mined out area, backfilled area, etc., A huge water reservoir will be developed in lower benches of the mined out area about 1.84.00ha at conceptual stage. Following mitigation measures are proposed for reducing the impacts on the ecology of the area –

-
- Siltation of water bodies and agriculture fields will be avoided by collecting the surface run-off water from mine lease area and from surface dumps in settling ponds / mine pit through a network of garland drains. Provision of retaining walls, check bunds and gully plugs at strategic places will be made to arrest the silt from washing off.
 - The mining activities will not intersect the ground water table. However, water reservoir developed in the mined out pit will improve the ground water scenario in the area.
 - Plantation will be carried out in the mine lease area from the first year of re-commencement of mining operations. Thus, a good amount of green cover will be developed in the mine lease area.
 - The plantation, to be carried out along the periphery of the mine, surface dumps, mined out area, safety barrier zone, backfilled area, etc., will arrest the dust generated from the mine. Thus, the deposition of dust outside the mine lease area will be insignificant.
 - Blasting will be carried out during noon hours.
 - The ultimate reclamation planned leaves a congenial environment for development of flora & immigration of small fauna through green belt and water reservoir. The green belt and water reservoir developed within the Mine Lease at the end of mine life will attract the birds and animals towards the mine lease area in the post mining period.

Plantation Programme –

The mine management will carry out an extensive plantation programme within the mine lease area. The programme will involve plantation for greenbelt around the mine lease area, plantation on backfilled area, plantation on safety barrier zone, plantation around the infrastructure facilities etc. Regular plantation will be carried out on top benches of the mined out pits. Every year, plantation will be carried out on the last years exhausted workings.

Green Belt Development

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

Species Recommended for Plantation

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

- ❖ Natural growth of existing species and survival rate of various species.
- ❖ Suitability of a particular plant species for a particular type of area.
- ❖ Creating of bio-diversity.
- ❖ Fast growing, thick canopy cover, perennial and evergreen large leaf area,
- ❖ Efficient in absorbing pollutants without major effects on natural growth.
- ❖ The following species may be considered primarily for plantation best suited for the prevailing climatic condition in the area.

TABLE 10.1: RECOMMENDED SPECIES TO PLANT IN THE GREENBELT

Sl.No.	Name of the plant (Botanical)	Family Name	Common Name
1.	<i>Azadirachta indica</i>	<i>Meliaceae</i>	Neem, Vembu
2.	<i>Tamarindus indica</i>	<i>Fabaceae</i>	Tamarind, Puliyamaram
3.	<i>Polyalthia longifolia</i>	<i>Annonaceae</i>	Indian mast tree, Vansulam (Asoka tree)
4.	<i>Borassus flabellifer</i>	<i>Areceaceae</i>	Palmyra Palm

SOCIO ECONOMIC WELFARE MEASURES –

The company will adopt following social welfare measures for the development of local people in the process of industrial development of the area.

Employment Generation –

The mining operations have created direct employment opportunities for about 28 skilled, semi-skilled and un-skilled persons in the nearby villages. Apart from this more than 50 persons will get secondary employment opportunities in the mining and associated activities. Also there will be business development opportunities in the service sector like shops, garages, hotels, etc., for the mine and mine employees. Thus, there will be direct and secondary employment opportunities for about 76 local persons. This will lead to economic up-liftment of the nearby villages.

REHABILITATION & RESETTLEMENT –

No Rehabilitation and Resettlement proposed; since it's an existing mine.

OCCUPATIONAL SAFETY & HELTH MANAGEMENT –

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

Medical Surveillance and Examinations –

- Identifying workers with conditions that may be aggravated by exposure to dust & noise and establishing baseline measures for determining changes in health.
- Evaluating the effect of duct & noise on workers
- Enabling corrective actions to be taken when necessary
- Providing health education

The medical surveillance program consists of the following:

- Pre-employment medical examinations
- Periodic medical examination
- Awareness & Training

- Record keeping

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

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

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

Proposed Occupational Health and Safety Measures –

- Providing a working environment that is conducive to safety & health
- Employee involvement and commitment in the implementation of health and safety guidelines
- Implementing safety and health management system and assessing the effectiveness through periodic audits
- Setting of safety and health objectives based on comprehensive strategic plans and measure performance against these plans
- Monitoring the effects of mining activities on safety and health and conducting regular performance reviews
- Provision of necessary standards personal protective equipment's
- Establishing employees at all levels receive appropriate training and are competent to carry out their duties and responsibilities.
- Provision of rest shelters for mine workers with amenities like drinking water, fans, toilets etc.,
- Rotation of workers exposed to noisy areas.
- Periodical dust suppression on haul roads to prevent dust emission into the air.
- First-aid facilities in the mining area.

FIGURE 10.2: PERSONAL PROTECTIVE EQUIPMENT TO THE MINE WORKERS



11. SUMMARY AND CONCLUSIONS

11.1 PROJECT BACKGROUND

The mining lease for limestone was granted to M/s. RAGAVENDRA MINERALS AND CHEMICALS, Karur District vide G.O. 3(D) No. 63, Industries (MMA2) Department Dated: 19.05.1998 for a period of 20 years from 12.11.1998 to 11.11.2018 and the lease deed was executed on 12.11.1998.

As on the date of MoEF & CC Notification S.O. 804 (E) Dated: 14.03.2017, the project had no Environmental Clearance and it was clearly communicated by order to apply for environmental clearance under this notification. Therefore, the project proponent applied for environmental clearance vide online proposal no. IA/TN/MIN/63828/2017 Dated: 09.04.2017

MoEF & CC vide notification S.O. 1030 (E) Dated: 08.03.2018, notified that violation projects of Category B –the appraisal and approval there of shall vest with the State or Union territory level Expert Appraisal Committees and State or Union territory Environment Impact Assessment Authorities in different States and Union territories, constituted under sub-section (3) of section 3 of the Environment (Protection) Act, 1986.

Therefore, the online proposal to SEIAA – TN vide online proposal number SIA/TN/MIN/23051/2018 Dated 03.04.2018.

ToR was issued vide Lr.No.SEIAA-TN/F.No.6121/TOR-323/2018 Dated: 10.05.2018.

Proponent applied for the extension for the existing ToR vide online proposal No SIA/TN/MIN/268233/2022 Dated 16.04.2022. The proposals were considered in 309th SEAC – TN Meeting held on 02.09.2022 and issued Terms of Reference (ToR) vide Lr.No.SEIAA-TN/F.No.6121/TOR-323/Ext/ Dated: 26.09.2022, The validity of the Terms of Reference is upto **09.05.2023**.

Again, the proposal was placed in 369th SEAC meeting held on 20.04.2023 and SEAC decided to constitute a subcommittee to make an on-site inspection to assess the present Status of the project site and Environmental settings as the proposal falls under violation category and submit the report along with the recommendations to the committee.

Further the committee called for the following additional details:

- To assess ecological damage assessment whether it is being carried out in accordance with CPCB Guidelines, remediation plan, natural resource augmentation and community resource augmentation.

After the receipt of Additional details from the PP and the evaluation report by the subcommittee, SEAC will deliberate on the issue of environmental clearance under violation category. SEAC also decided to request SEIAA-TN to initiate action under sec-19 of the Environment (Protection) act, to be taken for

violation cases, in accordance with law and the proposal was placed in 616th SEIAA meeting held on 10.05.2023.

The view of the above, the authority accepts the decision of SEAC and decided to request the member secretary SEIAA to communicate the SEAC minutes to the PP and to write to the state govt\TNPCB to take credible action under the provision of Sec – 19 of the Environment (Protection) act, 1986 against the Project Proponent as per the EIA notification.

The Proposal was placed in 416th SEAC meeting held on 13.10.2023 and as per the 416th SEAC &670th SEIAA Minutes of Meeting During the meeting, SEAC has decided to direct the PP to conduct the Public hearing for the above proposal.

Therefore, after the long deliberation and discussions in the 416th SEAC meeting, The SEAC has observed that the Public hearing is mandatory for all mining projects of Major Minerals category irrespective of the area for ensuring the scientific and systematic mining and the conservation minerals. The SEAC decided to direct the PP to conduct the Public hearing as per the procedure described in EIA notification 2006 and submit the minutes of the public hearing with action plan for considering the application\proposal towards the grant of EC.

After the receipt of the minutes of the Public Hearing along with updated Final EIA Report submitted by the PP along with a valid Mining Lease. and approved Mining Plan/Scheme of Mining including the PMCP/FMCP for the proposed mining operations, the SEAC may deliberate the future course of action.

Again, the Proposal was placed in 440th SEAC meeting held on 11.01.2024 and as per the 440th SEAC &697th SEIAA Minutes of Meeting. The proponent requested to extend the validity of ToR to conduct Public Hearing and to update the EIA Report accordingly. since the validity of ToR issued is about to expire on 09.05.2023. The Committee after detailed discussion,

SEIAA may write a letter to TNPCB to consider the above-mentioned cases as a special case and shall be requested to conduct public hearing as per the procedure laid down in EIA Notification, 2006 with the updated baseline data along with EIA report and shall be completed within 1 year from the date of issue of letter.

This proposal was placed in 697th SEIAA meeting and after detailed discussions, the Authority decided to grant extension of ToR for further period of 1 year i.e. up to 11.01.2025 as recommended by SEAC. All the other conditions stipulated in the ToR Lr.No.SEIAA-TN/F.No.6121/TOR-323/Ext/ Dated: 26.09.2022, issued under violation category

Now, as per MMDR Amendment Act 2015, the validity of lease period is extended upto 11.11.2048 and Review of Mining Plan & Progressive Mine Closure Plan was prepared by RQP and approved by

Regional Controller of Mines, Indian Bureau of Mines, Chennai vide Lr.No TN/KRR/ROMP/LST-1713.MDS Dated 25.08.2023

As per Gazette Notification S.O. 1886 (E) of 20th April 2022, Mining Projects are classified under two categories i.e. A (> 250 Ha) and B (< 250 Ha), Category-A projects (including expansion and modernization of existing projects) require Environmental Clearance from Central Government (Ministry of Environment, Forests and Climate Change, Government of India, New Delhi) while Category-B projects are considered by State Level Environmental Impact Assessment Authority (SEIAA), constituted by MoEF&CC, New Delhi. If in case, any Category “B” project attracts the “General Condition” given in the EIA Notification, it shall be treated as Category “A” and will be considered at MoEF&CC, New Delhi.

This EIA report is prepared for M/s. RAGAVENDRA MINERALS AND CHEMICALS Thennilai Limestone Mine– Extent 2.51.5 ha with proposed capacity of 3,06,592 tonnes (ROM- 2023-24 to 2027-28) at S.F. No. : 809/2, 3, 4 & 5 (P) in Thennilai Village, Kadavoor Taluk, Karur District and Tamil Nadu State. The project falls under category “B” and requires Environmental Clearance from SEIAA Tamil Nadu.

A detailed Draft EIA/EMP Report was prepared for public and other stakeholders’ suggestions and this Final EIA EMP Report is prepared based on the outcome of Public Consultation and the outcome will be incorporated in the final EIA/ EMP Report.

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

The main scope of the EIA study is to quantify the cumulative impact in the study area and formulate the effective mitigation measures. A detailed account of the emission sources, emissions control equipment, background Air quality levels, Meteorological measurements, Dispersion model and all other aspects of pollution like effluent discharge, Dust generation etc., have been discussed in this report. The baseline monitoring study has been carried out during the months December 2021 to February 2022 for various environmental components so as to assess the anticipated impacts of the cluster quarry projects on the environment and suitable mitigation measures for likely adverse impacts due to the proposed project is suggested individually for the respective proposed project under Chapter 10.

The project proponent ensures to obtain necessary clearances and quarrying will be carried out as per rules and regulations. The Mining Activity will be carried out in a phased manner as per the approved mining plan after obtaining EC, CTO from TNPCB, execution of lease deed and obtaining DGMS Permission and working will be carried out under the supervision of Competent Persons employed.

Overall, the EIA report has predicted that the project will comply with all environment standards and legislation after commencement of the project and operational stage mitigation measures are implemented.

Mining operations has positive impact on environment and socio economy such as landscape improvement, water as by-product, economy development and better public services, providing and supply of Limestone as per market demand.

Sustainable and modern mining leads us to see positive impact of mining operation and providing consistent employment for nearly 28 people directly and indirectly around 50 people.

As discussed, it is safe to say that the proposed quarry is not likely to cause any significant impact to the ecology of the area, as adequate preventive measures will be adopted to keep the various pollutants within the permissible limits. Green belt development around the area will also be taken up as an effective pollution mitigate technique, as well as to serve as biological indicators for the pollutants released from the M/s.Ragavendra Minerals and Chemicals Limestone quarry (Extent:2.51.5 ha).

12.0 DISCLOSURE OF CONSULTANTS ENGAGED

M/s Geo Exploration and Mining Solutions is an Accredited Organization under Quality Council of India – National Accreditation Board for Education & Training, New Delhi.

Name and address of the consultants carried out the EIA studies:

GEO EXPLORATION AND MINING SOLUTIONS

No 17, Advaitha Ashram Road,

Alagapuram, Salem – 636 004

Tamil Nadu, India












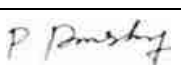
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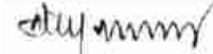
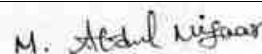

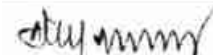
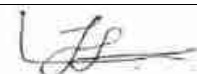

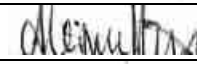










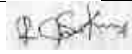
Web: www.gemssalem.com

Phone: 0427 2431989.

The accredited Experts and associated members are engaged for this EIA study as given below.


TABLE 12.1: DECLARATION OF EXPERTS

Sl. No	Functional Areas		Name of the expert	In house/ Empaneled	Signature
1	WP	FAE	Dr. M. Ifthikhar Ahmed	IH	
		FAA	Mr. N. Sathish Kumar	IH	
		TM	Mr. S.Nagamani	IH	
			Mr. P.Viswanathan		
			Mr. M.Santhoshkumar		
2	AQ	FAE	Mr. N. Senthil Kumar	EMP	
		TM	Mr. G.Imram Khan	IH	
			Mr. P.Panneer selvam	IH	
3	AP	FAE	Mr. A. Jagannathan	IH	
		FAA	Mr. Siva Palanivelu	IH	
		TM	Mr. G.Imram Khan	IH	
			Mr. P.Panneer selvam	IH	

			Mr. Ahmed Basha	IH	
4	NV	FAE	Mr. A. Jagannathan	IH	
		TM	B.Venkata Giri	IH	
E.Vadivel					
5	GEO	FAE	Dr. P. Thangaraju	IH	
		FAA	Mr. Abdul Nisaar	IH	
		TM	Mr. S.Nagamani	IH	
6	HG	FAE	Dr. P. Thangaraju	IH	
		FAA	Mr. L. Jayaraj	IH	
		TM	Mr. M.Santhoshkumar	IH	
7	LU	FAE	Mr. A. Allimuthu	IH	
		TM	Mr. M.Santhoshkumar	IH	
8	EB	FAE	Mr. Amirtham Sakthivel	IH	
		TM	Mr. P.Panneer selvam	IH	
9	SC	SC	Dr. M. Ifthikhar Ahmed	IH	
		TM	R.Sivakumar	IH	
10	SH	FAE	Mr. A. Jagannathan	IH	
		TM	R.Sivakumar	IH	
			S.Uma Maheshwaran	IH	
11	SE	FAE	Mrs. K. Anitha	IH	
		TM	J.Kannan	IH	
		TM	R.Sivakumar	IH	

Declaration by the Head of the Accredited Consultant Organization / Authorized person

I, M. Ifthikhar Ahmed, hereby confirm that the above mentioned experts prepared EIA Report for Environmental Clearance (after TOR) for Thennilai Limestone Mine over an Extent of 2.51.5ha in at Thennilai Village of Kadavur Taluk, Karur District of Tamil Nadu. It is also certified that information furnished in the above EIA study are true and correct to the best of our Knowledge.

Signature : 

Name : **Dr. M. Ifthikhar Ahmed**
(Authorized Signatory)

Designation : **EIA Coordinator /Managing Partner**

Name of the EIA



Consultant organization : **M/s. Geo Exploration and Mining Solution**

NABET Certificate no. &

Issue Date : **NABET/EIA/2225/RA0276 Dated 20.02.203**

Valid : **Valid upto 06.08.2025**

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

ANNEXURE
M/s. RAGAVENDRA MINERALS AND
CHEMICALS THENNILAI
LIMESTONE QUARRY

S.F. Nos : 809/2,3,4 & 5(P)

Extent : 2.51.5 ha

Village : Thennilai

Taluk : Kadavur

District : Karur

Complied as per TOR vide

Letter No. SEIAA- TN/F.No.6121/TOR-323/2018 Dated: 10.05.2018

Extension of ToR obtained vide

Letter No. SEIAA-TN/F.No.6121/TOR-323/Ext/ Dated: 26.09.2022

As per 440th SEAC & 697th SEIAA (Minutes of Meeting)

EXTENT = 2.51.5 ha

Project Proponent

M/s. RAGAVENDRA MINERALS AND CHEMICALS

Thiru. E. Dhanapal (Managing Partner)

No. D/364, 1st Cross,

Ukkirakaliamman Koil Street,

Anna Nagar, Thennur,

Trichy- 620 017

LIST OF ANNEXURES

Annexure No	DESCRIPTION	PAGE NO
I	COPY OF TERMS OF REFERENCE	1A – 23A
II	COPY OF EXTENSION TERMS OF REFERENCE	24A – 28A
III	COPY OF G.O LETTER	29A – 32A
IV	COPY OF 500M RADIUS QUARRIES DETAILS LETTER	33A-34A
V	COPY OF MINE PLAN APPROVED LETTER	35A – 36A
VI	COPY OF APPROVED ROMP	37A – 127A
VII	COPY OF LAST PERMIT LETTER	128A
VIII	COPY OF BASE LINE MONITORING DATA	129A – 181A
IX	COPY OF NABET CERTIFICATE	182A



THIRU A.V. VENKATACHALAM, 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.6121/TOR- 323/2018 Dated:10.05.2018

To

M/s. Ragavendra Minerals & Chemicals
D/364, 1st Cross
Ukkirakaliamman Koil Street
Anna Nagar
Thennur
Trichy District – 620 017



Sir / Madam,

Sub: SEIAA, Tamilnadu – Terms of Reference (ToR) under violation for the Existing Limestone mine over an extent of 2.51.5 Ha at S.F. No. 809/2, 3, 4 & 5 (P), Thennilai Village, Kadavoor Taluk, Karur District by M/s. Ragavendra Minerals & Chemicals under project category – B and Schedule S.No. 1(a) – TOR issued for the preparation of EIA report, EMP report, ecological damage assessment, remediation plan, natural resource augmentation and community resource augmentation –Regarding.

- Ref:** 1. MoEF&CC Notification S.O. 804 (E) dated 14.03.2017
2. MoEF&CC notification S.O.1030 (E) dated 08.03.2018
3. Your application dated: 09.01.2017 & 24.03.2018
4. Minutes of the 106th SEAC Meeting held on 05.04.2018
5. Minutes of the 296th SEIAA Meeting held on 10.05.2018

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MEMBER SECRETARY
SEIAA-TN (S/S)

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

The proponent of M/s. Ragavendra Minerals & Chemicals, submitted application for Terms of Reference on 24.03.2018, in Form-I, Pre- Feasibility report for the Limestone mine over an extent of 2.51.5 Ha at S.F. No. 809/2, 3, 4 & 5 (P), Thennilai Village, Kadavoor Taluk, Karur District, Tamilnadu seeking ToR under the MoEF & CC Notification cited under reference 1nd & 2nd.

The proposal seeking ToR was placed before the 106th SEAC meeting held on 05.04.2018. Based on the document furnished, the Committee observed that the project falls under the category B1 and schedule 1(a) of the EIA Notification, 2006. The SEAC recommends the Terms of Reference for the project for assessment of Ecological damage, remediation plan and natural & community resource augmentation plan to be prepared as an independent chapter in the Environment Impact Assessment report by the Accredited consultant and also with collection and analysis of data for the assessment of ecological damage, preparation of remediation plan and natural & community resource augmentation plan to be done by an Environmental laboratory duly notified under the Environment (Protection) Act, 1986, accredited by NABET or a laboratory of council of Scientific and Industrial research Institutions working in the field of Environment. Three months data relating to the ecological parameters is to be submitted with analysis.

The project proponent besides above has to also submit the No Objection certificate (NOC) from State Mines and Geology Department. The NOC should also indicate whether the mine was operated.

- Without Environmental Clearance (EC) or in excess of quantity approved in EC.
- Without consent to Operate (CTO) or in excess of quantity approved in CTO.
- Without mining plan/scheme of mining or in excess of quantity approved in mining plan/scheme of mining.
- Without Forest clearance
- Any other violation such as excess quantity mined during the mining period to assess the ecological and other damages.



[Signature]
MEMBER SECRETARY
SEIAA-TN

[Signature]
10/5/18

The proposal was considered as recommended by SEAC in 296th SEIAA meeting held on 10.05.2018 vide Item No.296 – 05 and after detailed discussion, the authority decided to issue ToR for considering the mining period from 2018-19 onwards only for the preparation of EIA report along with additional ToR.

Additional TOR specified by the SEAC to deal with the violation aspects of the mining projects

SECTION A

As per the MoEF & CC Notification S.O. 1030 (E) dated: 08.03.2018,

1. "The cases of violations will be appraised by the Expert Appraisal Committee at the Central level or State or Union territory level Expert Appraisal Committee constituted under sub-section (3) of section 3 of the Environment (Protection) Act, 1986 with a view to assess that the project has been constructed at a site which under prevailing laws is permissible and expansion has been done which can run sustainably under compliance of environmental norms with adequate environmental safeguards, and in case, where the findings of Expert Appraisal Committee for projects under category A or State or Union territory level Expert Appraisal Committee for projects under category B is negative, closure of the project will be recommended along with other actions under the law.
2. In case, where the findings of the Expert Appraisal Committee or State or Union territory level Expert Appraisal Committee on point at sub-paragraph (4) above are affirmative, the projects will be granted the appropriate Terms of Reference for undertaking Environment Impact Assessment and preparation of Environment Management Plan and the Expert Appraisal Committee or State or Union territory level Expert Appraisal Committee, will prescribe specific Terms of Reference for the project on assessment of ecological damage, remediation plan and natural and community resource augmentation plan and it shall be prepared as an independent chapter in the environment impact assessment report by the accredited consultants, and the collection and analysis of data for assessment of ecological damage, preparation of remediation plan and natural and community resource



augmentation plan shall be done by an environmental laboratory duly notified under the Environment (Protection) Act, 1986, or a environmental laboratory accredited by the National Accreditation Board for Testing and Calibration Laboratories, or a laboratory of the Council of Scientific and Industrial Research institution working in the field of environment.”

After the appraisal of the project, the SEAC decided that the Para No.2 stated above is applicable to the project. Hence, the proponent is directed to prepare appropriate reports as contained in the Para 2.

While complying with the specific aspects of the MoEF & CC directions as stated in the Para 2 above, the following steps should be followed:

Step 1: Enumerate the aspects of Violation:

- a) The proponent should enumerate the violations as applicable to the project.
- b) Furnish a description of each violation with quantitative and qualitative data.
- c) Violation categories are to be decided taking into consideration the stage at which the project execution stands.

Step 2: Ecological Damage Assessment:

- a) For each aspect of violation enumerated in step (1), identify the resultant environmental damage that may have been caused.
- b) Furnish a description of the environmental damages with quantitative and qualitative data.

Step 3: Remediation Plan:

- a) For the Environmental damage(s) identified in the step (2) above, prepare the remediation plan for the each or combination of damages.
- b) The remediation plan should essentially consists of problem statement, target to be achieved (quantity), standards, technology/procedure for remediation, equipment and machinery to be used, time schedule and remediation cost(direct and indirect cost, capital as well as O&M costs).



SECTION B

1. Natural resource Augmentation:

a) The resources that should be considered for augmentation should essentially consist of land, biota, air, water and other resources as applicable.

b) Proponent may choose one or more of the resource augmentation as applicable and provide a description of the augmentation proposal in detail for each resource.

c) The proponent should also furnish the cost for each augmentation scheme.

2. Community resource Augmentation:

a) The proponent should prepare a plan of action for addressing the needs of the community in terms of resources in the sectors of education, health and sports primarily and other such resources as applicable to the community in the vicinity of the project.

b) The community resource augmentation plan should consist of rehabilitation of houses and people, budget allocation and time schedule for completing the activity.

SECTION C

The proponent should prepare content for the ecological damage assessment, remediation plan, natural resource augmentation and community resource augmentation separately in a chapter and include in the EIA / EMP report.

SECTION D

a) After the appraisal of the EIA / EMP report submitted by the proponent, the SEAC will make a judgement of the quality of the content in the EIA / EMP report specifically with reference to the chapter covering the ecological damage assessment, remediation plan, natural resource augmentation and community resource augmentation.

b) In the judgement of SEAC, if the quality of the content in the chapter is not satisfactory, the SEAC may direct the proponent to further revise the chapter and resubmit the EIA/EMP report.



- c) If SEAC concludes that the technical part is satisfactory and the costing aspect is not satisfactory then the SEAC may revert to legal provisions, MoEF & CC guidelines and similar expert committee recommendations for finalizing the cost aspects or the SEAC may use its own expertise and experience in finalizing the cost.

SECTION E

The proponent is directed to furnish data as per the questionnaire appended in Annexure I. It will help the SEAC in arriving the ecological damage and the associated cost.

SECTION F

In compliance with the Supreme Court order stated in MoEF & CC letter F.No. 3-50/2017 IA.III-pt dated: 05th January 2018, the proponent is required to submit the No Objection Certificate obtained from the Department of Geology and Mining, Government of Tamil Nadu regarding payment of 100% cost of illegally mined mineral under section 21(5) of MMDR Act 1957 which would account for mining operations in violation of the following:

- a) Without Environmental Clearance (EC), or in excess of the quantity approved in EC
- b) Without Consent to Operate (CTO) or in excess of the quantity approved in CTO and
- c) Without mining plan/scheme of mining or in excess of the quantity approved in mining plan / scheme of mining
- d) Without Forest Clearance
- e) Any other violation

List out the details of reserve forest and wildlife sanctuary nearby the project site (the details should also include other districts which are nearby the project site) and also furnish the detail of distance between the project site and reserve forests/wildlife sanctuary.




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SEIAA-TN

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20/5/18

Whether the project site attracts the HACA clearance? If so, also furnish the HACA clearance for the mining from the competent authority.

The proponent is instructed to fill in the form contained in **Annexure 1** to work out the details of the ecological damage during the violation period.

A. STANDARD TERMS OF REFERENCE

- 1) Year-wise production details since 1994 should be given, clearly stating the highest production achieved in any one year prior to 1994. It may also be categorically informed whether there had been any increase in production after the EIA Notification 1994 came into force, w.r.t. the highest production achieved prior to 1994.
- 2) A copy of the document in support of the fact that the Proponent is the rightful lessee of the mine should be given.
- 3) All documents including approved mine plan, EIA and Public Hearing should be compatible with one another in terms of the mine lease area, production levels, waste generation and its management, mining technology etc. and should be in the name of the lessee.
- 4) All corner coordinates of the mine lease area superimposed on a High Resolution Imagery/ toposheet, topographic sheet, geomorphology and geology of the area should be provided. Such an Imagery of the proposed area should clearly show the land use and other ecological features of the study area (core and buffer zone).
- 5) Information should be provided in Survey of India Toposheet in 1:50,000 scale indicating geological map of the area, geomorphology of land forms of the area, existing minerals and mining history of the area, important water bodies, streams and rivers and soil characteristics.
- 6) Details about the land proposed for mining activities should be given with information as to whether mining conforms to the land use policy of the State; land diversion for mining should have approval from State land use board or the concerned authority.
- 7) It should be clearly stated whether the proponent Company has a well laid down Environment Policy approved by its Board of Directors? If so, it may be spelt out in the



EIA Report with description of the prescribed operating process/procedures to bring into focus any infringement/deviation/ violation of the environmental or forest norms/ conditions? The hierarchical system or administrative order of the Company to deal with the environmental issues and for ensuring compliance with the EC conditions may also be given. The system of reporting of non-compliances / violations of environmental norms to the Board of Directors of the Company and/or shareholders or stakeholders at large, may also be detailed in the EIA Report.

- 8) Issues relating to Mine Safety, including subsidence study in case of underground mining and slope study in case of open cast mining, blasting study etc. should be detailed. The proposed safeguard measures in each case should also be provided.
- 9) The study area will comprise of 10 km zone around the mine lease from lease periphery and the data contained in the EIA such as waste generation etc. should be for the life of the mine / lease period.
- 10) Land use of the study area delineating forest area, agricultural land, grazing land, wildlife sanctuary, national park, migratory routes of fauna, water bodies, human settlements and other ecological features should be indicated. Land use plan of the mine lease area should be prepared to encompass preoperational, operational and post operational phases and submitted. Impact, if any, of change of land use should be given.
- 11) Details of the land for any Over Burden Dumps outside the mine lease, such as extent of land area, distance from mine lease, its land use, R&R issues, if any, should be given.
- 12) A Certificate from the Competent Authority in the State Forest Department should be provided, confirming the involvement of forest land, if any, in the project area. In the event of any contrary claim by the Project Proponent regarding the status of forests, the site may be inspected by the State Forest Department along with the Regional Office of the Ministry to ascertain the status of forests, based on which, the Certificate in this regard as mentioned above be issued. In all such cases, it would be desirable for representative of the State Forest Department to assist the Expert Appraisal Committees.




MEMBER SECRETARY
SEIAA-TN

10/5/18

- 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 alongwith budgetary provisions for their conservation should be prepared in consultation with State Forest and Wildlife Department and details furnished. Necessary allocation of funds for implementing the same should be made as part of the project cost.
- 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

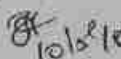



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- also be indicated and where so required, clearance certifications from the prescribed Authorities, such as the SPCB or State Mining Department should be secured and furnished to the effect that the proposed mining activities could be considered.
- 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 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).
- 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




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

- 24) The water requirement for the Project, its availability and source should be furnished. A detailed water balance should also be provided. Fresh water requirement for the Project should be indicated.
- 25) Necessary clearance from the Competent Authority for drawl of requisite quantity of water for the Project should be provided.
- 26) Description of water conservation measures proposed to be adopted in the Project should be given. Details of rainwater harvesting proposed in the Project, if any, should be provided.
- 27) Impact of the Project on the water quality, both surface and groundwater, should be assessed and necessary safeguard measures, if any required, should be provided.
- 28) Based on actual monitored data, it may clearly be shown whether working will intersect groundwater. Necessary data and documentation in this regard may be provided. In case the working will intersect groundwater table, a detailed Hydro Geological Study should be undertaken and Report furnished. The Report inter-alia, shall include details of the aquifers present and impact of mining activities on these aquifers. Necessary permission from Central Ground Water Authority for working below ground water and for pumping of ground water should also be obtained and copy furnished.
- 29) Details of any stream, seasonal or otherwise, passing through the lease area and modification / diversion proposed, if any, and the impact of the same on the hydrology should be brought out.
- 30) Information on site elevation, working depth, groundwater table etc. Should be provided both in AMSL and bgl. A schematic diagram may also be provided for the same.
- 31) A time bound Progressive Greenbelt Development Plan shall be prepared in a tabular form (indicating the linear and quantitative coverage, plant species and time frame) and

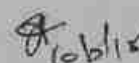


submitted, keeping in mind, the same will have to be executed up front on commencement of the Project. Phase-wise plan of plantation and compensatory afforestation should be charted clearly indicating the area to be covered under plantation and the species to be planted. The details of plantation already done should be given. The plant species selected for green belt should have greater ecological value and should be of good utility value to the local population with emphasis on local and native species and the species which are tolerant to pollution.

- 32) Impact on local transport infrastructure due to the Project should be indicated. Projected increase in truck traffic as a result of the Project in the present road network (including those outside the Project area) should be worked out, indicating whether it is capable of handling the incremental load. Arrangement for improving the infrastructure, if contemplated (including action to be taken by other agencies such as State Government) should be covered. Project Proponent shall conduct Impact of Transportation study as per Indian Road Congress Guidelines.
- 33) Details of the onsite shelter and facilities to be provided to the mine workers should be included in the EIA Report.
- 34) Conceptual post mining land use and Reclamation and Restoration of mined out areas (with plans and with adequate number of sections) should be given in the EIA report.
- 35) Occupational Health impacts of the Project should be anticipated and the proposed preventive measures spelt out in detail. Details of pre-placement medical examination and periodical medical examination schedules should be incorporated in the EMP. The project specific occupational health mitigation measures with required facilities proposed in the mining area may be detailed.
- 36) Public health implications of the Project and related activities for the population in the impact zone should be systematically evaluated and the proposed remedial measures should be detailed along with budgetary allocations.
- 37) Measures of socio economic significance and influence to the local community proposed to be provided by the Project Proponent should be indicated. As far as possible, quantitative dimensions may be given with time frames for implementation.
- 38) Detailed environmental management plan (EMP) to mitigate the environmental impacts




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which, should inter-alia include the impacts of change of land use, loss of agricultural and grazing land, if any, occupational health impacts besides other impacts specific to the proposed Project.

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



- website of this Ministry, should be followed.
- h) Changes, if any made in the basic scope and project parameters (as submitted in Form-I and the PFR for securing the TOR) should be brought to the attention of MoEF&CC with reasons for such changes and permission should be sought, as the TOR may also have to be altered. Post Public Hearing changes in structure and content of the draft EIA/EMP (other than modifications arising out of the P.H. process) will entail conducting the PH again with the revised documentation.
- i) As per the circular no. J-H011/618/2010-IA.II(I) dated 30.5.2012, certified report of the status of compliance of the conditions stipulated in the environment clearance for the existing operations of the project, should be obtained from the Regional Office of Ministry of Environment, Forest and Climate Change, as may be applicable.
- j) The EIA report should also include (i) surface plan of the area indicating contours of main topographic features, drainage and mining area, (ii) geological maps and sections and (iii) sections of the mine pit and external dumps, if any, clearly showing the land features of the adjoining area.

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

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

- 1) Project name and location (Village, District, State, Industrial Estate (if applicable).
- 2) Products and capacities. If expansion proposal then existing products with capacities and reference to earlier EC.
- 3) Requirement of land, raw material, water, power, fuel, with source of supply (Quantitative)
- 4) Process description in brief, specifically indicating the gaseous emission, liquid effluent and solid and hazardous wastes.
- 5) Measures for mitigating the impact on the environment and mode of discharge or disposal.
- 6) Capital cost of the project, estimated time of completion.



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- 7) Site selected for the project - Nature of land - Agricultural (single/double crop), barren, Govt/ private land, status of its acquisition, nearby (in 2-3 km.) water body, population, within 10km other industries, forest, eco-sensitive zones, accessibility, (note - in case of industrial estate this information may not be necessary)
- 8) Baseline environmental data - air quality, surface and ground water quality, soil characteristic, flora and fauna, socio-economic condition of the nearby population
- 9) Identification of hazards in handling, processing and storage of hazardous material and safety system provided to mitigate the risk.
- 10) Likely impact of the project on air, water, land, flora-fauna and nearby population
- 11) Emergency preparedness plan in case of natural or in plant emergencies
- 12) Issues raised during public hearing (if applicable) and response given
- 13) CSR plan with proposed expenditure.
- 14) Occupational Health Measures
- 15) Post project monitoring plan

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

- a. A note confirming compliance of the TOR, with cross referencing of the relevant sections / pages of the EIA report should be provided.
- b. All documents may be properly referenced with index, page numbers and continuous page numbering.
- c. Copy of permission related to Port facility, Desalination plant, wind mill /solar power plant from competent Authority.
- d. Where data are presented in the report especially in tables, the period in which the data were collected and the sources should be indicated.
- e. While preparing the EIA report, the instructions for the proponents and instructions for the consultants issued by MoEF vide O.M. No. J-11013/41/2006-IA.II(I) dated 4th August, 2009, which are available on the website of this Ministry should also be followed.
- f. 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



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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 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.

The receipt of this letter may be acknowledged.

SEIAA

TN

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Copy to:

1. The Principal Secretary to Government, Environment & Forests Dept,
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, Ministry of Environment & Forest (SZ),
34, HEPC Building, 1st & 2nd Floor, Cathedral Garden Road, Nungampakkam, Chennai -34.
5. Monitoring Cell, I A Division, Ministry of Environment & Forests,
Paryavaran Bhavan, CGO Complex, New Delhi 110003.
6. Stock File.



Annexure 1**Additional information for considering EC for mining projects**

S.No.	Details to be provided	Page no.																				
1)	Name of the project lease & owner																					
2)	Lease Extent																					
3)	Lease Validity																					
4)	Approved Mining Plan/Scheme – Review a) Specify whether DSR is provided (applicable in case of minor minerals only)																					
5)	Specify - Nature and type of violation																					
	I. Without EC or in excess of quantity approved in EC																					
	II. Without CTO or in excess of quantity approved in CTO																					
	III. Without mining plan/Scheme of mining or in excess of quantity approved in Mining plan/Scheme of mining.																					
	IV. Without forest Clearance																					
	V. Any other violation																					
6)	Violation period																					
	I. Number of months																					
	II. Number of Years																					
7)	Exploitation/Excavation quantity- Reserves proved through exploration by drilling																					
8)	Give details of production from the date of execution of the lease deed / since 1994																					
	<table border="1"> <thead> <tr> <th rowspan="2">Year and quantity</th> <th colspan="2">2010-11*</th> <th colspan="2">2011-12*</th> <th colspan="2">2012-13*</th> </tr> <tr> <th>Planned</th> <th>Actual</th> <th>Planned</th> <th>Actual</th> <th>Planned</th> <th>Actual</th> </tr> </thead> <tbody> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> </tbody> </table>	Year and quantity	2010-11*		2011-12*		2012-13*		Planned	Actual	Planned	Actual	Planned	Actual								
Year and quantity	2010-11*		2011-12*		2012-13*																	
	Planned	Actual	Planned	Actual	Planned	Actual																



	Ore/mineral/granite blocks (tonnes)						
	Waste (tonnes/cu.m)						
	* year of mining operation						
9)	Quantity mined out during the violation period & if, yes indicate the violated quantity, in term of % of consented quantity.						
	Year and quantity mined out during the violation period	2010-11		2011-12		2012-13	
		Planned	Planned	Planned	Actual	Planned	Actual
	Ore/mineral/granite blocks (tonnes)						
	Waste excavation (tonnes/cu.m)						
10)	State illegal mining/encroachments outside the lease boundary? Percentage of quantity mined out outside the lease boundary.						
11)	Method of working						
	I. Category type: (a) Mechanised (b) Semi - Mechanised (c) Manual						
	II. Construction and design of haul roads						
	a) Dimension as per the statutory requirements which were followed or otherwise						
	b) Number of vehicles plying on the main haul roads						



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	inside the mine and the approach road to the pit located outside the mine, if any.										
	c) Are any measures taken to minimise fugitive dust generated from mine haul roads? Does it comply with the CPCB/PCB Guidelines?										
	d) Is there a possibility that air pollutants emitted from the project area that do not comply with air quality standards as per CPCB/PCB?										
12)	Mechanized / Semi – Mechanized Method of Mining										
	(i) Number of loading / excavating equipments as per approved mining plan and capacity.										
	(ii) Number of loading / excavating equipments actually being deployed and capacity.										
	(iii) Type and number of transporting equipments.										
	(iv) Type of transporting system used – (a) trucks (b) Any other mode										
	(v) Capacity and Number of trucks used as per approved mining plan										
	(vi) Capacity and Number of trucks used actually in the mine.										
	(vii) Number and capacity of loading equipments and trucks used not in line with approved mining plan.										
	<table border="1"> <thead> <tr> <th></th> <th>Capacity (m³)</th> <th>Numbers</th> </tr> </thead> <tbody> <tr> <td>Excavator</td> <td></td> <td></td> </tr> <tr> <td>Trucks</td> <td></td> <td></td> </tr> </tbody> </table>		Capacity (m ³)	Numbers	Excavator			Trucks			
	Capacity (m ³)	Numbers									
Excavator											
Trucks											
	(viii) Impact of excess deployment of loading equipments (excavators) and transporting equipments on environment. (a) Air pollutants (b) Water Quality										



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	(c) Land Quality	
	(d) Noise level	
	(ix) Does the deployment of loading equipments (excavators) and trucks fulfil the statutory requirements as per MMR 1961, with respect to the site conditions?	
13)	Method of Rock Breaking/Material preparation for the excavation:	
	(i) Methodology adopted –	
	a) Drilling and blasting	
	b) Rock breakers	
	c) Rippers	
	d) Surface miners	
	e) Direct mucking by excavators	
	f) Manual means	
	g) Any other methods or combination of above	
	(ii) In case of drilling and blasting method:	
	(a) Type of blasting: short hole or deep hole	
	(b) Whether controlled blasting technique adopted? If yes, specify the technique with details of study, year of study	
	(c) Impacts due to blasting defined as per the studies, if any carried out previously as indicated	
	(d) Dust pollution	
	(e) Noise level (dB(A))	
	(f) Ground vibration studies and Fly rock projection	
	(iii) Impact of preparation of Ore and waste on environment-	
	a) Air Pollution	
	b) Noise Pollution	
	c) Water Pollution	
	d) Safety standards	



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	e) Traffic density	
	f) Road Condition (vulnerability)	
14)	Construction and Design of Dumps.	
	a) Place/Location	
	b) Approach to Dump form the mine distance and safety standards.	
	c) Area of extent occupied	
	d) Dimension of Dump and No. of terrace with heights (benches)	
	e) Vegetation covered ; If yes, specify the details of plants	
15)	Construction and Design of Waste Dumps	
	(i) Numbers and Location of Dumps as per approved Mining Plan	
	(ii) Specify whether reject dumps are located within or outside mining lease	
	(iii) Area occupied in excess of the approval mining plan.	
	(iv) Dimension of Terracing, Light, shapes, etc., Dump as per approved Mining Plan	
	(v) Fresh/Existing Dimension Height, shape, width. etc., of Dumps in the mine.	
	(vi) Volume/Quantity added to Waste/Dump during the violated period.	
	(vii) Approach to the Dump-Dimension, distance.	
	(viii) Number of and type of equipments deployed in Dump.	
	(ix) Provision of Garland drains around the Dumps.	
	(x) Any vegetation made on the slopes.	
	(xi) Provision of safety standards.	
	(xii) Impact of Waste/Dumps on environment.	
	a) Air pollution	
	b) Water pollution	
	c) Dust pollution	



	d) Noise pollution	
	(xiii) Terracing	
16)	Construction and Design of Ore and sub grade ore/mineral Stacks:-	
	(i) Number and Location of Ore stacks.	
	(ii) Dimension of Ore/sub grade Stacks as per the Approved Mining Plan	
	(iii) Volume/Quantity added during the violation period.	
	(iv) Any Screening plant or any other loading equipment engaged during the violated period.	
	(v) Approach to Ore / sub grade stack –Distance, hazards.	
	(vi) Safety standards adopted while operation.	
	(vii) Impact of ore/sub grade on environment	
	a. Air pollution	
	b. Water pollution	
	c. Dust pollution	
	d. Noise pollution	
17)	Mine Pit Water	
	(i) Intersection of Ground water table, specify the measures taken.	
	(ii) Ground water table as per hydro geological Studies (Pumping test).	
	(iii) Provision of Garland drains around pit and dumps	
	(iv) Water pollution	
	(v) Management of mine water.	
	(vi) Ultimate pit limit, w.r.t Ground water intersection and management of drainage of ground water.	
18)	Diversion of General Drainage/River/Nallah course for mining	
19)	Clearing of vegetation before the commencement of mining operation- Number of trees (species wise)	
20)	Man Power	
	(a) Statutory management	
	(b) Regular (Non –statutory) Manpower	

21)	Occupational Health and Safety.	
	(a) Periodical monitoring of health standards of persons employed as per Mine Act, 1952.	
	(b) Failure to inform statutory bodies periodically, if any	
22)	Population (Nearby Habitation)	
	(i) Population/Significant Population/Dense Population within the buffer zone of 10 Kms.	
	(ii) People displacement due to mining activities	
	(iii) Location/ Existence of habitation near the river or any other historical/sensitive/ forest distance.	
	(iv) Impact of mining on Surrounding and habitation-Air, Water, Noise, Pollution.	
	(v) Socio Economic aspects of mining.	
23)	CSR	
	(a) Field ground Activities or studies. Actual amount spent towards CSR and the future proposal.	
24)	NOC from DMG for quantity clarification in respect of settlement of all the amount payable against identified violation.	
25)	For the Clearance of EC, Public Hearing is mandated as per MoEF & CC Notification. Give reason for exemption of public hearing.	
26)	Conceptual post mining land use/restoration	
27)	Litigation/court cases, if any pending	
28)	Disaster management plan for the mine	





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

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

TERM OF REFERENCE-EXTENSION

Lr. No.SEIAA-TN/F.No. 6121 /TOR- 323/Ext/ dated:26.09.2022

To

M/s. Ragavendra Minerals & Chemicals
D/364, 1st Cross
Ukkirakaliamman Koil Street
Anna Nagar, Thennur
Trichy - 620017

Sir/Madam,

Sub: SEIAA-TN – Extension of validity of the Terms of Reference granted under Violation category for the Existing Lime Stone Mine Lease over an extent of 2.51.5Ha at S.F.No. 809/2, 3, 4 & 5(P) of Thennilai Village, Kadavoor Taluk, Karur District, Tamil Nadu by M/s. Ragavendra Minerals & Chemicals –issued – Regarding.

- Ref:**
1. Earlier ToR issued by SEIAA-TN vide Lr. No. SEIAA-TN/F.No.6121/TOR-323/2018 Dated: 10.05.2018
 2. Amendment to ToR Lr.No. SEIAA-TN/F.No.6121/SEAC-CXVIII/TOR-323(A)/2018 Dated: 30.07.2018
 3. MoEF&CC Notification S.O. 221(E) 18.01.2021
 4. Online Proposal No. SIA/TN/MIN/268233/2022 dated: 16.04.2022
 5. Your Application for Extension of Validity of Terms of Reference dated: 21.04.2022.


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6. Minutes of the 309th meeting of SEAC held on 02.09.2022
7. Minutes of the 554th meeting of Authority held on 26.09.2022.

In the reference 1st cited above, the Terms of Reference under Violation was accorded to M/s. Ragavendra Minerals & Chemicals for the Existing Lime Stone Mine Lease over an extent of 2.51.5Ha at S.F.No. 809/2, 3, 4 & 5(P) of Thennilai Village, Kadavoor Taluk, Karur District, Tamil Nadu, vide T.O. Lr. No. SEIAA-TN/F.No.6121/TOR- 323/2018 Dated: 10.05.2018.

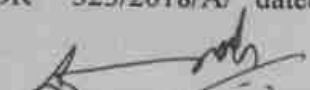
Now the proponent has applied online through Parivesh portal vide Proposal No. SIA/TN/MIN/268233/2022 dated: 16.04.2022 for the extension of validity of ToR with all required documents.

SEAC Remarks:

Existing Lime Stone Mine Lease over an extent of 2.51.5Ha at S.F.No. 809/2, 3, 4 & 5(P) of Thennilai Village, Kadavoor Taluk, Karur District, Tamil Nadu by M/s. Ragavendra Minerals & Chemicals for Extension of validity for the Terms of References "Under Violation".
(SIA/TN/MIN/268233/2022 dated: 16.04.2022)

The proposal was placed in the 309th Meeting of SEAC held on 02.09.2022. The details of the project furnished by the proponent are available in the website (parivesh.nic.in). The SEAC noted the following:

1. The project proponent, M/s. Ragavendra Minerals & Chemicals for the Existing Lime Stone Mine Lease over an extent of 2.51.5Ha at S.F.No. 809/2, 3, 4 & 5(P) of Thennilai Village, Kadavoor Taluk, Karur District, Tamil Nadu.
2. The proposed quarry/activity is covered under Category "B" – "Under Violation" of Item 1(a) "Mining Projects" of the Schedule to the EIA Notification, 2006.
3. The Proponent had applied for ToR to carry out the EIA study under violation vide dated. 24.03.2018.
4. The ToR for carrying out the EIA study under violation was issued vide Lr.No. SEIAA-TN/F.No.6121/TOR- 323/2018 Dated: 10.05.2018.
5. Further, Amendment to ToR Lr.No. SEIAA-TN/F.No.6121/SEAC-CXVIII/TOR-323(A)/2018 Dated: 30.07.2018 and the ToR Extension under violation was issued vide SEIAA. Lr. No. SEIAA-TN/F.No. 6121/TOR- 323/2018/A/ dated:


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30.10.2021.

- 6 As per MoEF&CC O.M Dt:29.08.2017, the validity of ToR shall be 4 years for all the projects/activities and 5 years for River Valley and HEP Projects.
7. Now the Proponent has applied online through Parivesh portal vide Proposal No. SIA/TN/MIN/268233/2022 dated: 16.04.2022 for the extension of validity of ToR with all required documents.
8. The PP had cited the reasons of the outbreak of the Corona virus (covid-19) and subsequent lockdowns which had put the studies initiated as a part of EIA on hold and they were unable to proceed further to submit the final EIA report in time.


The SEAC had observed the MoEF&CC Notification S.O. 1247(E), dated the 18 March, 2021, stating that “.....the period from the 1st April, 2020 to the 31st March, 2021 shall not be considered for the purpose of calculation of the period of validity of Prior Environmental Clearances granted under the provisions of this notification in view of outbreak of Corona Virus (COVID-19) and subsequent lockdowns (total or partial) declared for its control, however, all activities undertaken during this period in respect of the Environmental Clearance granted shall be treated as valid... ”.

Hence, the SEAC after detailed discussions confirmed that the validity of the ToR issued is valid (deemed to be) up to 09.05.2023 as per the aforesaid MoEF Notification dated 18.01.2021.

Therefore, the project proponent is requested to submit Public Hearing minutes, EIA/EMP report along with required details on the following – (i) facets of violation, assessment of ecological damage, remediation plan and natural and community resource augmentation plan which shall be prepared as an independent chapter in the environment impact assessment report (iii) the compliance report on the violation ToR issued earlier.

SEIAA Remarks:

The proposal was placed in the 554th meeting of Authority held on 26.09.2022. The Authority noted that the subject was placed in the 309th meeting of SEAC held on 02.09.2022 and the Committee has furnished its recommendation for the grant of extension of ToR under violation category for one more year in accordance with the MoEF&CC Notification S.O. 221(E), dated 18.01.2021. The Authority, after detailed deliberations accepted the aforesaid recommendations of the SEAC and decided to grant extension of ToR under violation category for one more year subject to the ToR as recommended by the SEAC in addition to the following ToR:


MEMBER SECRETARY
SEIAA-TN

1. The project proponent shall submit valid mining lease and scheme of mining plan obtained from the competent authority.
2. The project proponent shall submit excess mined out quantity during the violation period after 15.01.2016 along with details of existing pit within the proposed mining area and the copy of remittance of fine levied for the same from the concerned AD/DD, Geology & Mining Dept.
3. The project proponent shall submit details of case filed against the project proponent under Section 19 of the Environment (Protection) Act, 1986.
4. The limestone quarry involves raw material extraction, transportation and comminution. Therefore, large quantity of diesel and electricity are supposed to be consumed in the production. The diesel-fuel and electricity to be consumed to be furnished.
5. What are the green mining technologies to be adopted for reducing GHG/CO₂ emissions and lowering the carbon footprint in the limestone mining.
6. Strategies adopted for safety and healthy mining operations.
7. What are the transparency and accountability system in place during the operation and post-operation period of the project.
8. What are the In-House environmental performance and evaluation tools to understand negative impacts of mining.
9. Detailed study to be made on material flow analysis and Life Cycle Assessment (LCA) in the process of production.
10. Through a chart illustration, clarify the cradle to grave approach for extraction of limestone and anticipated emissions, environmental threats in every stage and mitigation strategy at every stage.
11. Project Proponent to study impacts on human health viz respiratory impacts, toxicity impacts and radiation impacts.
12. Study to be made on aquatic, terrestrial toxicity, aquatic eutrophication including detailed terrestrial toxicity and their impacts of wildlife and biodiversity.
13. What is the total water withdrawal consumption, likely temperature rises and climate change impacts.
14. What are the chemical exposures in the limestone mining and risks anticipated to environmental and human health.


MEMBER SECRETARY
SEIAA-TN

All other conditions imposed in ToR Letter No. SEIAA-TN/F.No.6121/TOR- 323/2018 Dated: 10.05.2018 and Amendment dated: 30.07.2018 remain unaltered.


MEMBER SECRETARY
SEIAA-TN

Copy to:

1. The Secretary, Ministry of Mines, Government of India, Shastri Bhawan, New Delhi.
2. The Additional Chief Secretary to Government, Environment and Forests Department, Tamil Nadu.
3. The Principal Secretary to Government, Industries Department, Tamil Nadu.
4. The Additional Principal Chief Conservator of Forests, Regional Office (SZ), 34, HEPC Building, 1st& 2nd Floor, Cathedral Garden Road, Nungambakkam, Chennai – 34.
5. The Chairman, Central Pollution Control Board, Parivesh Bhawan, CBD-Cum-Office Complex, East Arjun Nagar, New Delhi-110 032.
6. The Chairman, TNPC Board, 76, Mount Salai, Guindy, Chennai-32
7. The District Collector, Karur District
8. The Commissioner of Geology and Mines, Guindy, Chennai-32
9. EI Division, Ministry of Environment & Forests, Paryavaran Bhawan, New Delhi.
10. Spare.

GOVERNMENT OF TAMIL NADU

ABSTRACT

Mines and Minerals-Mining lease - Limestone - Kazur District
Kulithalai Taluk, Thennilai village - Over an extent of
2.51.5 hectares - in S.F.Nos. 809/2, 3, 4 and 5 (Part) - Grant
of mining lease to Tvl. Raghavendra Minerals and Chemicals,
Thiruchirappalli - Orders - Issued.

Industries (MMA2) Department

C. O. (3D) No. 63

Date: 19.5.98

Read:

1. Application of Tvl. Raghavendra Minerals and Chemicals, Thiruchirappalli for grant of mining lease dt. 3.6.91.
2. From the District Collector, erstwhile Thiruchirappalli District Ir.D. Dis. (A) 1054/91, dt. 6.12.91 and Ir. Co. A. 117/92, dt. 6.9.93.
3. From the Commissioner of Geology and Mining Ir. Co. No. 22859/B2/91, dt. 21.7.93 and 6.9.93.
4. Govt. Ir. No. 32924/MMA2/93-3, dt. 21.3.96 and 30.7.97.
5. From the Government of India, Ministry of Mines, New Delhi Ir. No. 4/307/97-M.V., dt. 3.3.98.

....

ORDER:

Tvl. Raghavendra Minerals and Chemicals, Thiruchirappalli-18 have applied for the grant of fresh Mining lease to win the mineral limestone over an extent of 6.22 acres (2.51.5 hectares) in S.F. Nos. 809/2, 809/3, 809/4 and 809/5 (Part) of Thennilai village, Kulithalai Taluk, Thiruchirappalli District for a period of 20 years.

2. The District Collector, erstwhile Thiruchirappalli District had reported that the lands applied for mining lease are patta lands. The lands in S.F. Nos. 809/2 and 809/5 (Part) stand in the names of Thiru Dhanapal and Tmt. Poongothai vide patta No. 2369. The lands in S.F. Nos. 809/3 and 809/4 stand in the name of Tmt. Poongothai vide Patta No. 402. Tmt. M. Poongothai, who is one of the pattadars of the above lands has given her consent to grant mining lease in favour of Tvl. Raghavendra Minerals and Chemicals, Thiruchirappalli to win the mineral limestone in the above lands, since she is also one of the partners of the above applicant firm. There are no permanent structures and no electric or telephone line passes through the land applied for mining lease. The applicant firm have proposed to set up a pulverising

p.t.o.


Dr. P. THANGARAJU, M.Sc., Ph.D.,
Qualified Person



Industry to pulverise the low grade limestone. They have also proposed to utilise the high grade limestone in their proposed Cem and Burnt-Lime Manufacturing Industries. The area applied for mining lease has not been reserved for State Exploitation by any State undertaking, and lies 26 kms. South East of the Chettinadu Cements, Puliur. The District Collector, erstwhile Tiruchirappalli District has recommended for the grant of mining lease to Tvl. Raghavendra Minerals, Tiruchirappalli over an extent of 2.51.5 hectares in S.F.No. 809/2 etc. of Thennilai village, Kulithalai Taluk, Karur District for a period of 10 years, subject to the condition that the applicant-Firm should establish the pulverising Industry, Cem & Burnt Lime Manufacturing Industries within one year from the date of sanction of lease by the Government.

3. The Director of Geology and Mining has reported that the area satisfies Section 6(1)(c) of the Mines and Minerals (Regulation and Development) Act 1957. The Deputy Director, Tiruchirappalli has assessed the mineable reserve of limestone in this area as 1,47,400 tonnes for assumed depth of 12 metres at 60% recovery. The grade of limestone in this area is both chemical and SMS grade. As regards industrial programme, the applicant firm has proposed to set up a burnt-lime and limestone powder unit (pulverising) in S.F.No. 635/1A of Ratchandrathirumalai village, in Kulithalai Taluk with the financial assistance from Tamil Nadu Industrial Investment Corporation Limited. They have obtained approval of the Panchayat Union Commissioner, Thogamalai and Town Planning Officer, Tiruchirappalli for the building plan and setting up of the units respectively. An investment of Rs. 19 lakhs has been envisaged for the proposed units and setting up of the burnt lime unit depends on the sanction of Tamil Nadu Industrial Investment Corporation Limited (TIIC) Loan. The Director of Geology and Mining has recommended the mining lease application of Tvl. Raghavendra Minerals and Chemicals for limestone over an extent of 2.51.5 hectares (6.22 acres) in S.F.No. 809/2, 809/3, 809/4 and 809/5 part of Thennilai village, Kulithalai Taluk, Karur District for a period of 5 years subject to the following conditions.

- 1) The applicant-Firm should establish the pulverising Industry, Cem & Burnt Lime Manufacturing Industries within one year from the date of sanction of lease by the Government.
- 2) Chemical and high grade limestone should be used in the proposed industry for burnt lime. Cement and cement plus grade encountered during mining should be supplied to nearby cement industry. Only limestone with a Cao content of less than 42% should be utilised in the pulverising Unit.

4. As per the amended provisions of section 6(1) of the Mines and Minerals (Regulation and Development) Act, 1957, the minimum period for which a mining lease may be granted shall not be of less than 20 years.

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5. The Government after careful consideration of the Mining lease application of Tvl. Raghavendra Minerals and Chemicals with reference to the recommendation of the erstwhile District Collector, Tiruchirappalli and the Director of Geology and Mining have decided to grant mining lease to the applicant firm for a period of 20 years and addressed the Government of India for their approval. The Government of India in their letter 5th read above have conveyed their approval under section 5(1) of the Mines and Minerals (Regulation and Development) Act, 1957 and under rule 27(3) of the Mineral Concession Rules, 1960 for grant of mining lease for limestone over an extent of 2.51.5 hectares in S.F.Nos. 809/2 etc. of Thennilai village, Kulithalai Taluk, Karur District in favour of Tvl. Raghavendra Minerals and Chemicals, Thiruchirappalli for a period of 20 years.

6. In exercise of the powers conferred under section 10(3) of the Mines and Minerals (Regulation and Development) Act, 1957 (Central Act 67 of 1957), the Governor of Tamil Nadu hereby sanctions the grant of mining lease in favour of Tvl. Raghavendra Minerals and Chemicals, Tiruchirappalli for limestone over an extent of 2.51.5 hectares in S.F.Nos. 809/2, 809/3, 809/4 and 809/5 (part) of Thennilai village, Kulithalai Taluk, Karur District for a period of 20 years subject to the conditions mentioned in para 3 above and other usual conditions specified in the Appendix to this order.

7. The rate of royalty, dead rent and surface rent shall be as follows:-

Royalty: Limes done

- | | |
|---|---|
| A) L.D. Grade (Less than 1.5% silica content) | Rs. 50/- (Rupees fifty only) per tonne. |
| B) Others | Rs. 32/- (Rupees thirty two) per tonne. |

Dead Rent:

- | | |
|------------------------------------|--|
| First year of the lease | Nil |
| Second to fifth year of lease | Rs. 60/- (Rupees sixty) per hectares per annum. |
| Sixth to tenth year of lease | Rs. 120/- (Rupees one hundred and twenty) per hectare per annum. |
| Eleventh year of lease and onwards | Rs. 180/- (Rupees one hundred and eighty) per hectare per annum. |

The rates of royalty and dead rent are subject to such changes as may be notified from time to time.

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Water rate and surface rent; At such rates as the land revenue and other cesses assessable in the land shall be paid.

8. The applicant should pay a deposit of Rs.2000/- (Rupees two thousand only) as prescribed in rule 32 of the Mineral Concession Rules, 1960 before the lease deed is executed.

9. The terms and conditions mentioned in this order are subject to such further modifications, additions and alterations as may be included in the lease deed when finalised.

10. The District Collector, Karur District is requested to take necessary further action for execution of the lease deed in the prescribed form after satisfying the requirements mentioned in para 6 above. He is requested to report the date of execution of lease deed to the Government and the Commissioner of Geology and Mining as soon as the lease deed is executed. The Collector is also requested to ensure compliance of the amended provision of Mines and Minerals (Regulation and Development) Act, 1957 and Mineral Concession Rules, 1960 and other applicable Acts and Rules including Forest (Conservation) Act, 1980 by the applicant firm before the lease deed is executed.

(BY ORDER OF THE GOVERNOR)

M.S. SRINIVASAN,
SECRETARY TO GOVERNMENT.

TO

The Commissioner of Geology and Mining, Guindy, Chennai-52.
The District Collector, Karur. (w/o) By RPAD.
M. Raghavendra Minerals and Chemicals,
No. 1, 4th Cross (West) Annamalai Nagar, Salai Road,
Tiruchirappalli.
The Secretary to Government of India,
Ministry of Mines,
'D' Wing, III Floor, Shastri Bhavan, New Delhi 110 001.
The Regional Controller of Mines, Indian Bureau of Mines,
C4A, CEO Complex, Chennai-90.

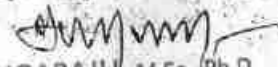
Copy to :

The Industries (OP. II) Department, Chennai-9.
The Chief Minister's Office, Chennai-9.
Sf/Sos.

Forwarded/By order.


Section Officer.

ms. 27/5.


Dr. P. THANGARAJU, M.Sc., Ph.D.,
Qualified Person

From

To

Dr.P.Jayapal M.Sc., Ph.D.,
Deputy Director,
Geology and Mining,
Karur.

Tvl.Ragavendra Minerals
and Chemicals,
No.1. 4th Cross (west)
Annamalai Nagar,
Salai Road, Tiruchirappalli.17.

Rc.No.807/Mines/2016, Dated: 05.01.2022

Sir,

Sub: Mines and Minerals – Major Minerals – Limestone - Karur District – Kadavur (erstwhile Kulithalai) Taluk – Thennilai Village - Patta lands S.F.No.809/2 (0.42.0 hecets), 809/3 (0.40.0 hecets), 809/4 (0.42.0 hecets) and 809/5 (Part) (1.27.5 hecets) over an extent of 2.51.5 hecets - Mining lease granted to Tvl.Ragavendra Minerals and Chemicals - lessee firm requested the details of Existing/ proposed/ abandoned mining situated within 500 mts radial distance of the lease granted area - furnished – Regarding.

- Ref: 1. Mining lease application for Limestone preferred by Tvl. Ragavendra Minerals and Chemicals, No.1. 4th Cross (west) Annamalai Nagar, Salai Road, Tiruchirappalli.17 dated: 03.06.1991.
2. G.O. (3D). No.63, Industries (MMA.2), Department, dated: 19.05.1998.
- 3 Thiru. E. Dhanapal letter dated: 05.01.2022

In the reference 1st cited, Tvl. Ragavendra Minerals and Chemicals have applied mining lease for mining limestone in Poramboke land S.F. No. 806/5(0.72.0) and Patta lands S.F.No.809/2 (0.42.0 hecets), 809/3 (0.40.0 hecets), 809/4 (0.42.0 hecets) and 809/5 (Part) (1.27.5 hecets) over an extent of 2.51.5 hecets in Thennilai Village, Kadavur (erstwhile Kulithalai) Taluk, Karur District. The Government have been granted the mining lease to Tvl. Ragavendra Minerals and Chemicals in the above mentioned area vide ref. 2nd cited. The mining lease has been executed on 12.11.1998 and lease period was from 12.11.1998 to 11.11.2018.

In this regard, the lessee Tvl. Ragavendra Minerals and Chemicals has requested the Deputy Director, Geology and Mining, Karur to provide the details of Existing, Proposed and abandoned mining leases situated within 500 meters radial distance from the lease granted area to lessee firm. Accordingly details are furnished as follows:-

I. Existing Mines: -

Sl No.	Name of the Owner	S.F.No.	Extent (hect)	Lease Period	Remarks.
1	Thiru. E.Dhanapal, Pathiripatty, Kulithalai Taluk, Karur District.	806/5 806/6 807/3 Total	0.72.0 1.13.0 1.30.0 3.15.0	17.06.1995 to 16.06.2015	Renewal proposal sent to Govt., through Commissioner on 19.08.2016 and last permit issued on 05.01.2017 under deemed extension.

II. Area applied for renewal/extension : -

Sl No.	Name of the Owner	S.F.No.	Extent (hect)	Lease Period	Remarks.
	Ragavendra Minerals And Chemicals, No.1. 4th Cross (west) Annamalai Nagar, Salai Road, Tiruchirappalli.17	809/2 809/3 809/4 809/5 (P) Total	0.42.0 0.40.0 0.42.0 1.27.5 2.51.5	12.11.1998 - 11.11.2018	Renewal proposal sent to Govt., through Commissioner on 19.08.2016 and last permit issued on 01.12.2016 under deemed extension

III. Lease Expired and abandoned Area: -

Sl No.	Name of the Owner	S.F.No.	Extent (hect)	Lease Period	Remarks.
1	K.Panneerselvam Radha Chemicals, C.39.Cauvery Nagar, Kulithalai.	815/1 815/2 815/3 815/ 4A 815/ 4B 815/5 Total	0.19.5 0.37.0 0.58.5 0.57.0 0.53.0 0.79.5 3.04.5	31.10.1995- 30.10.2015	Lease expired on 30.10.2015. last permit issued on 20.10.2015.

[Signature]
05/01/22
Deputy Director,
Geology and Mining,
Karur.

[Signature]
05/01/2022

Dr. P. V. R. J. C. (5)

Email / Speed post

GOVERNMENT OF INDIA
MINISTRY OF MINES
INDIAN BUREAU OF MINES
OFFICE OF THE REGIONAL CONTROLLER OF MINES

Telephone no.: 044-2491/4461/1570

Telefax no. 044-24911295

Email ID: ro.chennai@ibm.gov.in

C-4-A Rajaji Bhavan
CGO complex, Besant Nagar
Chennai – 600 090.

No. TN/KRR/LST/ROMP-1497.MDS

Dated : 23/05.2018

To :

M/s. Ragavendra Minerals and Chemicals
D/364, 1st Cross
UkkirakaliammanKoil Street
Anna Nagar, Thennur
Trichy – 620 017.

Sub. : Approval of Review of Mining Plan (including Progressive Mine Closure Plan) for Thennilai Limestone Mine over an extent of 2.51.5 hectares in S.F.Nos.809/2, 3, 4&5(P) in Thennilai Village, Kadavur Taluk, Karur District, Tamilnadu submitted by M/s. Ragavendra Minerals and Chemicals under Rule 17(1) of MCR, 2016.

Ref. : Party letter No.Nil dated 08.05.2018.

Sir,

In exercise of the powers delegated to me under Rule 16 of Minerals (Other than Atomic & Hydro Carbon Energy Minerals) Concession Rules, 2016 vide Gazette Notification No. S.O. 1857(E) dated 18.5.2016 issued by the Controller General, Indian Bureau of Mines under F.No. T-43004/CGBM/MM(DR)/2015, I hereby approve the above said Review of Mining Plan for **Limestone** mineral only. This approval is subject to the following conditions.

- 1) That the Review of Mining Plan (including Progressive Mine Closure Plan) is approved without prejudice to any other law applicable to the mine/area from time to time whether made by the Central Government, State Government or any other authority.
- 2) That this approval of the Review of Mining Plan (including Progressive Mine Closure Plan) does not in any way imply the approval of the Government in terms of any other provision of the Mines & Mineral (Development & Regulation) Act, 2015 or the Mineral Concession Rules, 2016 or any other law including Forest (Conservation) Act, 1960, Environment Protection Act, 1986 and the rules made there under.
- 3) That this Review of Mining Plan (including Progressive Mine Closure Plan) is approved without prejudice to any other order or direction from any court of competent jurisdiction.
- 4) Provisions of the Mines Act, 1952 and Rules & Regulations made thereunder including submission of notice of opening, appointment of manager and other statutory officials as required by the Mines Act, 1952 shall be complied with.
- 5) The Provisions made under MM(D&R) Act, 2015 (Amended) and Rules made thereunder shall be complied with.
- 6) The contents of circular No. 2/2010 issued by the Chief Controller of Mines, IBM, Nagpur vide his letter No. 11013/3/MP/90-CCOM Vol. VII dated 06.04.2010 shall be complied with.
- 7) The execution of Mining Plan / Review of Mining Plan shall be subjected to vacation of prohibitory orders / notices, if any.
- 8) This approval of mining operations and associated activities is restricted to the mining lease area only. The mining lease area is as shown on the statutory plans under rule 32 of Mineral Conservation and Development Rules, 2017, by the lessee. Indian Bureau of Mines does not take any responsibility regarding correctness of the boundaries of the lease shown on the ground with reference to the lease map and other plans furnished by the lessee.

- 9) The Environmental Monitoring Cell of the Company shall continue monitoring ambient air quality, dust fall rate, water quality, soil sample analysis and noise level measurements on various stations established for the purpose both in the core zone and buffer zone, as per Department of Environment guidelines and keeping in view IBM's Circular No.3/92, season-wise every year or by engaging preferably the services of an Environmental laboratory approved by MOEF/CPCB. The data so generated shall be maintained in a bound paged register kept for the purpose and the same shall be made available to the inspecting officer on demand.
- 10) If anything is found to be concealed as required by the Mines Act in the contents of Review of Mining Plan and proposal for rectification has not been made, the approval shall be deemed to have been withdrawn with immediate effect.
- 11) Yearly report as required under Rule 26(2) of MCDR,2017 setting for the extent of protection and rehabilitation works carried out as envisaged in the approved progressive mine closure plan and if there is any deviations, reasons thereof shall be submitted before 1st July of every year to the regional office, IBM , Chennai.
- 12) The Review of Mining Plan is approved for the proposals contained therein and as applicable from the date of approval of the document for the mining activities to be carried out within the mining leasehold. The earlier instances of irregular mining/illegal mining, if any, shall not be regularized through the approval of this document.
- 13) The financial assurance submitted should be renewed before expiry of the same.
- 14) In case mining lease falls within a radius of 10 kms. of National Park/Sanctuary, recommendations of NBWL have to be obtained as per the orders of the Hon'ble Supreme Court in I.A. No. 460/2004.
- 15) This approval is subject to the mining operations as per the proposals shall be carried out only after obtaining necessary clearances from MOEF, Pollution Control Board, Forest Department etc

Yours faithfully,

Encl. Copy of approved Review of Mining Plan
(including Progressive Mine Closure Plan)

Sd —

(V. Jaya Krishna Babu)
Regional Controller of Mines

Copy for information to:-

- ✓ 1. Dr. P. Thangaraju, Qualified person, M/s. Geo Exploration and Mining Solutions, Old No.260-B, New No.17, Advaita Ashram Road, Alagapuram, Salem – 636 004..
2. The Commissioner of Geology & Mining, Government of Tamilnadu, Guindy, Chennai – 600 032 along with copy of the approved Review of Mining Plan.

Encl : As above.

Krishna
28.5.18
(V. Jaya Krishna Babu)
Regional Controller of Mines

**GOVERNMENT OF INDIA
MINISTRY OF MINES
INDIAN BUREAU OF MINES
OFFICE OF THE REGIONAL CONTROLLER OF MINES, CHENNAI**

No. TN/KRR/ROMP/LST-1713.MDS

Dt : 25/08/2023

Shri/M/s. RAGAVENDRA MINERALS AND CHEMICALS ,

Old No.D-364, New No.D/11 1st Cross, Ukkirakaliamman Koil Street, Anna Nagar, Thennur, Trichy TRICHY, THENNILAI (2.515 HA) (63565201)

Sub Approval of Review of Mining Plan (including Progressive Mine Closure Plan) for Thennilai Limestone Mine over an extent of 2.51.5 : hectares in Thennilai Village, Kadavur Taluk, Karur District, Tamilnadu submitted by M/s. Ragavendra Minerals and Chemicals submitted under Rule 17(2) of MCR, 2016 & 23 of MCDR,2017.

Ref : (i) Your online submission of draft Review of Mining Plan in MPAS portal on 06.04.2023 in respect of aforesaid applied M.L.Area.
(ii) This office letter of even no. dated 19.04.2023.
(iii) Your online submission of final Review of Mining Plan document in MPAS portal on 08.08.2023 in respect of aforesaid applied ML area.

Sir,

In exercise of the powers delegated to me under Rule 16 of Minerals (Other than Atomic & Hydro Carbon Energy Minerals) Concession Rules, 2016 vide Gazette Notification No. S.O. 1857(E) dated 18.5.2016, I hereby accord approval for the above said Review of Mining Plan for **Limestone** mineral only. This approval is subject to the following conditions.:

A. General Conditions:

- 1) That the Review of Mining Plan (including Progressive Mine Closure Plan) is approved without prejudice to any other law applicable to the mine/area from time to time whether made by the Central Government, State Government or any other authority.
- 2) That this approval of the Review of Mining Plan (including Progressive Mine Closure Plan) does not in any way imply the approval of the Government in terms of any other provision of the Mines & Mineral (Development & Regulation) Act, 2015 or the Mineral Concession Rules, 2016 or any other law including Forest (Conservation) Act, 1980, Environment Protection Act, 1986 and the rules made there under.
- 3) That this Review of Mining Plan (including Progressive Mine Closure Plan) is approved without prejudice to any other order or direction from any court of competent jurisdiction.
- 4) Provisions of the Mines Act, 1952 and Rules & Regulations made thereunder including submission of notice of opening, appointment of manager and other statutory officials as required by the Mines Act, 1952 shall be complied with.
- 5) The Provisions made under MM(D&R) Act, 2015 (Amended) and Rules made thereunder shall be complied with.
- 6) The contents of circular No. 2/2010 issued by the Chief Controller of Mines, IBM, Nagpur vide his letter No. 11013/3/MP/90-CCOM Vol. VII dated 06.04.2010 shall be complied with.
- 7) The execution of Mining Plan / Review of Mining Plan shall be subjected to vacation of prohibitory orders / notices, if any.
- 8) This approval of mining operations and associated activities is restricted to the mining lease area only. The mining lease area is as shown on the statutory plans under rule 32 of Mineral Conservation and Development Rules, 2017, by the lessee. Indian Bureau of Mines does not take any responsibility regarding correctness of the boundaries of the lease shown on the ground with reference to the lease map and other plans furnished by the lessee.
- 9) The Environmental Monitoring Cell of the Company shall continue monitoring ambient air quality, dust fall rate, water quality, soil sample analysis and noise level measurements on various stations established for the purpose both in the core zone and buffer zone, as per Department of Environment guidelines and keeping in view IBM's Circular No.3/92, season-wise every year or by engaging preferably the services of an Environmental laboratory approved by MOEF/CPCB. The data so generated shall be maintained in a bound paged register kept for the purpose and the same shall be made available to the inspecting officer on demand.

- 10) If anything is found to be concealed as required by the Mines Act in the contents of Review of Mining Plan and proposal for rectification has not been made, the approval shall be deemed to have been withdrawn with immediate effect.
- 11) Yearly report as required under Rule 26(2) of MCDR,2017 setting for the extent of protection and rehabilitation works carried out as envisaged in the approved progressive mine closure plan and if there is any deviations, reasons thereof shall be submitted before 1st July of every year to the regional office, IBM , Chennai.
- 12) The Review of Mining Plan is approved for the proposals contained therein and as applicable from 01.04.2023 for the mining activities to be carried out within the mining leasehold. The earlier instances of irregular mining/illegal mining, if any, shall not be regularized through the approval of this document.
- 13) The financial assurance submitted should be renewed before expiry of the same.
- 14) In case mining lease falls within a radius of 10 kms. of National Park/Sanctuary, recommendations of NBWL have to be obtained as per the orders of the Hon'ble Supreme Court in I.A. No. 460/2004.
- 15) This approval is subject to the mining operations as per the proposals shall be carried out only after obtaining necessary clearances from MOEF, Pollution Control Board, Forest Department etc
- 16) This approval is subject to submission of DGPS Plan duly authenticated by the State Government and submission of modifications in the approved Mining Plan if, consequent to the authentication of DGPS Survey Plan, any change in mining lease area is accepted by the State Government. CHENNAI (2319 HA) (83565201)
- 17) This approval is subject to the conditions as per the directions given in W.P.(c) No. 114/2014 given by the Hon'ble Supreme Court of India should be taken care while implementing the proposals given in the PMCP part of the documents.

B. Special Conditions:

- 1) This approval is subjected to the final orders issued by the State Government/Directorate of Geology and Mining in continuation to their letter No.Rc.No.5808/MMS/2016 dated 05.08.2023 regarding status of mining lease as per section 4(A)(4), 8(A)(5) of MMDR Act, 2015(amended).
- 2) It shall be mandatory for the project proponent, abstracting ground water, to obtain **No Objection Certificate** from Central Ground Water Authority or, the concerned State/Union Territory Ground Water Authority, as the case may be.

Yours faithfully,

Encl: Soft copy of approval letter of Review of Mining Plan.

(G.C. Sethi)

Regional Controller of Mines

Copy forwarded for information to Shri. P. Viswanathan, Qualified Person, Old No.260-B, New No.17, Advaita Ashram Road, Alagapuram, Salem – 636 004.

(G.C. Sethi)

Regional Controller of Mines

Not on first two copies:

Copy forwarded for kind information to:

- 1) The Director, Department of Mines & Geology, Government of Tamilnadu, Guindy, Chennai - 600032.
- 2) The Controller of Mines (SZ), Indian Bureau of Mines, Bengaluru.
- 3) The Director of Mines Safety, DGMS, Chennai Region, Chennai.

(G.C. Sethi)

Regional Controller of Mines

Chapter 1 : General Information

1.1 : Lease Details

IBM Registration Number :	IBM/9752/2012
Lease Code :	63565201
Mine Code :	38TMN28029
Name of Lessee :	RAGAVENDRA MINERALS AND CHEMICALS
Address of Lessee :	Old No.D-364, New No.D/11 1st Cross, Ukkirakaliamman Koil Street, Anna Nagar, Thennur, Trichy TRICHY
Type of Lessee :	Private Entity Other Than Individual
Name of Mining Lease :	THENNILAI (2.515 HA)
State :	TAMIL NADU
District :	KARUR
Tehsil/ Taluk/ Mandal :	Kadavur
Village :	Thennilai
Lease Area (Ha) :	2.515
Forest Area (Ha) :	0.0000
Name of Minerals :	LIMESTONE

Name of associated minerals :	
Type :	Existing Lease
Period of the proposal (FY) from :	2023 - 24
Period of the proposal (FY) to :	2027 - 28
Type of working :	Opencast
Nature of Use :	Non Captive
Category of Mine :	Category A

1.1.1 : Initial/subsequent Lease grant details

Grant	From	To	Lease deed execution date	Lease registration date
Initial Grant	12/11/1998	11/11/2018	12/11/1998	12/11/1998

1.1.2 : Mining Plan Submission Criteria Details

Type of Document :	Review Of Mining Plan Under Rule 17(2) Of MCR, 2016
Reason/s For Modification :	Review Of Mining Plan Is Due For Submission
Period for which modification is proposed :	2023-2024 to 2027-2028

1.2 : Land Ownership Details

View Land Ownership Details Excel	Land_Ownership_Details.xlsx
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1.3 : Existing Lease

Date of Execution :	12/11/1998
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1.3.1 : Approval of earlier Mining Plan & Its Subsequent Review in Chronological Order

S.N.	Letter Number	Date	Period		Type Of Approved Document	Remark
			From	To		
1	TN/TCR/MP/LST-564-MDS	28/02/1998	12/11/1998	31/03/2003	Mining Plan	Nil
2	TN/KRR/LST/MS-439/MDS	20/04/2007	01/04/2006	31/03/2011	Scheme Of Mining	Nil
3	TN/KRR/LST/MS-885.MDS	12/08/2013	01/04/2011	31/03/2016	Scheme Of Mining	Nil
4	TN/KRR/LST/MS-1345.MDS	01/04/2016	01/04/2016	11/11/2018	Scheme Of Mining	Nil
5	TN/KRR/LST/ROMP-1497.MDS	22/05/2018	12/11/2018	31/03/2023	Review Of Mining Plan	Nil

1.3.2 : Partial Surrenderd Area During Stages of Operations in Chronological Order

Not Applicable

1.3.3 : Transfer of Lease Area Subsequent to Grant

Not Applicable

1.3.4 : Statutory Compliances**1.3.4.1 : Environment Clearance**

Applicable :	Yes
Letter No :	TOR extension granted by SEIAA. TOR Extension is enclosed as Annexure 5.
Date :	26/09/2022
Validity :	11/11/2048
ROM Mineral :	306602.0000 (Tonnes)

1.3.4.2 : SPCB Approvals

Letter No :	TOR extension granted by SEIAA. TOR Extension is enclosed as Annexure 5.
Approval of :	Consent To Operate
Date :	26/09/2022
Validity :	11/11/2048
ROM Mineral :	306602.0000 (Tonnes)

1.3.4.3 : Forest Clearance

Applicable :	No
Letter No :	Nil
Date :	Nil
Validity :	Nil

Area (Ha) :	Nil
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1.3.4.4 : Land Acquisition Details

Total Area Acquired in hectare:	2.5150
Total Amount Paid (INR) :	503000.0000

1.3.5 : Mine Location Details

Toposheet Number :	58 J 05
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1.3.5.1 : Location of Boundary Pillars

View Location of Boundary Pillars Excel	location_boundary_pillar.xlsx
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1.3.6 : Owner/Nominated Owner Details

Name	PAN of owner / Nominated Owner	Address of owner/ Nominated Owner	Mobile Number	Email	Please attach Minutes of Board Resolution in case of Nominated Owner
E Dhanapal	ADPPD4030M	Old NoD364 New NoD11 1st Cross Ukkirakaliamman Koil Street Anna Nagar Thennur Trichy620017	9443126726	omsakthitile@gmail.com	4 ID proof of lessee.pdf

1.3.7 : Qualified Person Details as per M(OAHCEM)CR, 2016

S.N.	Prefix	Name	PAN of QP	Address	Mobile no.	Qualification	Exp in years as prescribed under the rule	Email
1	Mr	P Viswanathan	AWJPV9232C	No: 17, Advaita	9442278601	MSc Geology	5	infogeoexploration

			Ashram Road, Alagapuram, Salem - 636 004.			@gmail.com
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Approved

Chapter 2A : Geology & Exploration

2A.1 : Geology

2A.1.1 : Topography

Terrain :	Plain
Highest Level (m) from MSL :	174.0000
Lowest Level (m) from MSL :	156.0000
Average Level (m) from MSL :	165.0000
Drainage Pattern :	Dendritic
Order of Stream :	Order 1
Min Dist of Stream from Lease Area(m) :	280.0000

2A.1.2 : Details of Physiographic features and Infrastructures available in and around the lease/ block area

Description	Location if existing Within the lease/block area	Distance from boundary periphery in kms, if existing outside the lease/block area. (within 5.00Kms)	Remark if any
River/Nallah/Reservoir	0	0.28	Water Stream-0.28km-NW
Public roads (Tar road, cart road)	0	3	Kulithalai-Tharagampatti Road 3km W & SH-199 Vaiyampatty Karur (via) Mylampatty and Uppidamangalam Road-5km SW
Railway track	0	0	Nil
Human settlements	0	1.5	Name of the Hamlets Distance in km Direction Population Thennilai 1.5km W 4300 Vellapatti 3.5km NW 3800 Keeranur 2.5km N 5500

Archaeological monuments/ places of worships/public utilities etc	0	2	Sri Mariamman Temple 2km W & Shri Kalamman Temple 1km NE
Wild life sanctuaries/ national parks	0	0	Nil
Coastal Regulation Zone (CRZ)	0	0	Nil
Powertransmision lines/telephone lines	0	0.25	LT - Power Line 0.25km NW
Firing range	0	0	Nil
Ordinance factory	0	0	Nil
grazing land/ burial ground or cremation ground	0	0	Nil
Any other specify	0	1.5	Nearby village-Thennilai 1.5km W , Nearest Railway station-Palayam 17km SW, Nearest Port-Airport Trichy E 47km & Seaport Tuticorin S 222km, Distance of SH/NH from lease area-SH-199 Vaiyampatty Karur (via Mylampatty and Uppidamangalam Road-5km SW & NH-81 Coimbatore to Chidambaram -20km NW

Particulars	Distance from lease boundary in kms
Near by village	1.50
Nearest Railway station	17.00
Nearest Port	47.00
Distance of SH/NH from lease area	5.00

2A.1.3 : Regional Geology

Regional Geology

Geologically, the entire district can be classified into hard rock and sedimentary formations. Hard rock Formation: - More than 90 percent of the district is underlain by hard rock of Archaean age. The geissic type of Formation is the major formation among the various types of hard rocks. The area comprises crystalline Archaean rocks of deep seated metamorphic origin which include

mainly calc-gneiss, cordierite-sillimanite Gneiss, Biotite gneiss and granite gneiss. The gneisses appear to have resulted by migratizations of the pre existing sediments by intrusive of high grade metamorphism viz. High temperatures and pressures. In addition, younger intrusive such as granites, pegmatites and quartz veins are found within the limestone. The above said different types of metamorphosed rocks occur in the form of long, narrow, parallel bands which are traceable over a long distance. Limestone, band is noticed with prominent outcrops. The regional trend of the rock in the area is NE – SW with Dipping SE.60 degree.

2A.1.4 : Local Geology & Structure

2A.1.4.1 : Local Geological Set-up

The area was surveyed in detail to prepare a Geological map in the scale of 1:1000 showing the various formations and attitude of the deposit. It is inferred that the Limestone mineral is of cement grade and in form Band running N40 degree E S40 degree W with SE70 degree dip. Reddish soil cover upto a depth in about 1m. The thickness of the limestone ranges from 30m to 33m. Recovery of minerals is estimated as 60% of the total excavation of the ore body. The recovery percentage is based on the knowledge gained from the present mine workings and adjacent working mine in this region, by the field tests carried out in the lease area and analysis done in NABL Laboratories. The remaining 40% of ROM is considered as Mineral rejects in these formations. The general geological sequence of the limestone deposits is as follows: Order of Super position: Age Rockformation Recent Reddish soil Achaeen- Crystalline limestone Calc-gneiss

2A.1.4.2 : Structure

Linear Banded Structure. The general drainage pattern of the area is of subdendritic and dendritic pattern. The area was surveyed in detail to prepare a Geological map in the scale of 1:1000 showing the various formations and attitude of the deposit. It is inferred that the Limestone mineral is of grade suitable for cement industries and in form single bed running N40 degree E S40 degree W with SE70 degree dip. Top soil cover upto a depth in about 1m.

2A.1.4.3 : Lithology, Petrographic & Mineralogical Description for Major, Associated & Indicator Minerals

The Karur District forms part of the Archean complex of peninsular gneiss. The general rock types of this area are Charnockite, Biotite gneiss, Migmatites and Anorthosites. Karur District is blessed with good reserves of Crystalline Limestone known as Palayam belt in Varavanai, Thennilai, Gudalur etc., The lease area encompasses crystalline Archean rocks of deep seated metamorphic origin which include mainly calc-gneiss, cordierite-sillimanite Gneiss, Biotite gneiss and granite gneiss. The gneisses appear to have resulted by migratizations of the pre existing sediments by intrusive of high grade metamorphism viz. High temperatures and pressures. In addition, younger intrusive such as granites, pegmatites and quartz veins are found within the limestone Geological Formation Quaternary Recent Laterite and soil pegmatite veins/quartz veins Proterozoic Acid intrusives Pink augen gneiss and migmatite Pink medium grained granite/pegmatoidal granite Pink Migmatite Hornblende biotite gneiss Garnetiferous quartzofeldspathic granulite Achaeen Charnockite group Pyroxene granulite And Charnockite Khondalite group Calc granulite/crystalline limestone Garnetiferous sillimanite gneiss The topsoil is about 1m followed by 32m thickness of Limestone formation.

2A.1.4.4 : Mode of Occurance & Controls of Mineralization

The limestone formation in Thennilai, belongs to the cretaceous system and rest over Archaean formations. The strike of the formation is N40 degree ES40 degree W direction with SE70 degree dip. The Archaean contact over which these formations rest is somewhat sheared and at places malachite staining can be observed. The area comprises crystalline Archaean rocks of deep seated metamorphic origin which include mainly calc-gneiss, cordierite-sillimanite Gneiss, Biotite gneiss and granite gneiss. The gneisses appear to have resulted by migratizations of the pre existing sediments by intrusive of high grade metamorphism viz. High temperatures and pressures. In addition, younger intrusive such as granites, pegmatites and quartz veins are found within the limestone. The above said different types of metamorphosed rocks occur in the form of long, narrow, parallel bands which are traceable over a long distance. The thickness of the limestone ranges from 30m to 33m. The physical attitude of the limestone bed is as follows: Strike Length (m):220 Width (m):68 Depth (m) Proved :33m with an average of 1m topsoil Strike direction : N 40 degree E S40 degree W Dip amount and direction : SE 70 degree Strike / Trend of the Ore Body: N 40 degree E S 40 degree W Amount of dip of Ore body: 70 degree Dip Direction of the Ore Body: SE Plunge of Mineral Body (degree) (if any): - Direction of plunge: -

2A.1.4.5 : Extent of Weathering/ Alteration

There is no weathering.

2A.1.4.6 : Nature/Form of Mineral

Lump

Specify If any other

Nil

2A.1.4.7 : Extent of Mineralization

The mine has reached maximum 18m depth and based on the existing pits and drilled core drills, the depth of the mineralization has been proved upto 33m with an average of 1m topsoil in the lease area. Hence, the reserves and resources are estimated upto 33m depth during the Present Plan Period.

2A.1.4.8 : Deposit Type (as per MEMC Rule)

Type of Deposit & Principal Minerals: Type of Deposit Bedded Stratiform and tabular deposits of regular and irregular habit: Principal Minerals Iron Ore, Manganese Ore, Bauxite, Limestone, Chromite/Potash and Salt Beds etc. Strike / Trend of the Ore Body: N40 degree E to S40 degree W Amount of dip of Ore body: 70 degree Dip Direction of the Ore Body: SE Plunge of Mineral Body (degree) (if any): - Direction of plunge: -

Strike / Trend of the Ore Body

NE	40	NE	to	SW	40	SW
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Amount of Dip of the Ore Body (degree)

Amount of Dip of the Ore Body (degree)

70	70
(from)	(to)

Dip Direction of the Ore Body		Plunge of Mineral Body (degree) (if any)		Direction of Plunge		
SE	0	SE	0	W	0	W

2A.2: Exploration**2A.2.1: Summary of The Previous Exploration (for fresh grant) / During Last Plan Period (for existing leases)**

Name of The Agency

Geo Exploration and Mining Solutions, Salem & Global Lab and Consultancy Services, Salem.

2A.2.1.1: Geological Mapping

Sl.No.	Year		Scale	Area Covered (Ha)
	From	To		
1	12/11/2018	31/03/2023	1:1000	2.5150

2A.2.1.2: Airborne Geophysical Survey

Sl.No.	Type of Survey	Spacing (m)	Total line (km)	Area Covered (Ha)	Latitude (dd:mm:ss.ss)		Longitude (dd:mm:ss.ss)	
					Form	To	Form	To
1	NIL	0	0.00	0.0000	Nil	Nil	Nil	Nil

2A.2.1.3: Ground Geophysical Survey

Sl.No.	Type of Survey	Spacing (m)	Total line (km)	Area Covered (Ha)	Latitude (dd:mm:ss.ss)		Longitude (dd:mm:ss.ss)	

					Form	To	Form	To
1	Nil	0	0	0.0000	Nil	Nil	Nil	Nil

2A.2.1.4: Geochemical Survey

SI.No.	Type of Sample	No of Samples	Aanalysis report	Area Covered (Ha)
1	Nil	0	Nil	Nil

2A.2.1.5: Pitting

Number of Pits															
0															

SI.No.	Year		Pit ID	Length of Pit (m)	Width of Pit (m)	Depth of Pit (m)	Depth (from)	Depth(to)	Running mtr	Litho units exposed	Name of the radical	Av Grade(in %)	Latitude (dd:mm:ss.ss)		Longitude (dd:mm:ss.ss)	
	From	To											From	To	From	To
1	Nil	Nil	Nil	0.00	0.00	0.00	0.00	0.00	0.00	Nil	Nil	0.00	Nil	Nil	Nil	Nil

2A.2.1.6: Trenching

Number of Trenches															
0															

2A.2.1.6.1: Spacing

Min (m)				Max (m)				Avg (m)			
0.00				0.00				0.00			

SI.No.	Year		Trench ID	Length of Trench (m)	Width of Trench (m)	Depth of Trench(m)	Depth (from)	Depth(to)	Running mtr	Litho units exposed	Name of the radical	Av. Grade	Latitude (dd:mm:ss.ss)		Longitude (dd:mm:ss.ss)	
	From	To											From	To	From	To

1	Nil	Nil	Nil	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0	0	0.0000	Nil	Nil	Nil	Nil
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2A.2.1.7 Exploratory Drilling(Core/non Core)

SI.No.	Year		Exploration agency	Core holes		Non-core (RC/DTH)		Grand total		Attach log sheet of each borehole in csv/excel format
	From	To		Number of boreholes drilled	Total mtrs	Number of boreholes drilled	Total mtrs	Number of boreholes drilled	Total mtrs	
1	Nil	Nil	0	0	0.00	0	0.00	0	0.00	Nil

2A.2.1.8: Exploratory Mining

SI.No.	Pit/Adit ID	Length in Mtr	Width in Mtr	Depth in mtrs	Volume (m ³)
1	Nil	0.00	0.00	0.00	0.00

2A.2.1.9: Sampling

SI.No.	Type of sample	No of samples collected	Number of samples analyzed	Latitude (dd:mm:ss.ss)		Longitude (dd:mm:ss.ss)		Remark if any
				From	To	From	To	
1	Drill Core	1	1	10:45:48.00	10:45:48.00	78:16:46.04	78:16:46.04	Nil
2	Drill Core	1	1	10:45:48.41	10:45:48.41	78:16:47.54	78:16:47.54	Nil
3	Drill Core	1	1	10:45:49.49	10:45:49.49	78:16:51.22	78:16:51.22	Nil
4	Drill Core	1	1	10:45:48.77	10:45:48.77	78:16:50.27	78:16:50.27	Nil
5	Drill Core	1	1	10:45:48.07	10:45:48.07	78:16:49.36	78:16:49.36	Nil

2A.2.1.10: Chemical Analysis

SI.No.	Sample ID	Minerals	Radical with garde in %	Name of Agency	Type of agency	Attachment

1	GLCS/TR/3028/2022-23	Limestone	CaO 47.95 MgO 1.25 SiO ₂ 8.56 Fe ₂ O ₃ 0.56 Al ₂ O ₃ 1.27 LOI 39.82-Cement grade	Global Lab and Consultancy Services, Salem	NABL accredited	3028.xlsx
2	GLCS/TR/3029/2022-23	Limestone	CaO 48.22 MgO 1.13 SiO ₂ 8.12 Fe ₂ O ₃ 0.51 Al ₂ O ₃ 1.02 LOI 40.20-Cement grade	Global Lab and Consultancy Services, Salem	NABL accredited	3029.xlsx
3	GLCS/TR/3030/2022-23	Limestone	CaO 47.58 MgO 1.17 SiO ₂ 8.85 Fe ₂ O ₃ 0.57 Al ₂ O ₃ 1.27 LOI 39.89-Cement grade	Global Lab and Consultancy Services, Salem	NABL accredited	3030.xlsx
4	GLCS/TR/3031/2022-23	Limestone	CaO 47.76 MgO 1.25 SiO ₂ 8.67 Fe ₂ O ₃ 0.49 Al ₂ O ₃ 1.27 LOI 39.62-Cement grade	Global Lab and Consultancy Services, Salem	NABL accredited	3031.xlsx
5	GLCS/TR/3032/2022-23	Limestone	CaO 47.70 MgO 1.33 SiO ₂ 8.79 Fe ₂ O ₃ 0.52 Al ₂ O ₃ 1.27 LOI 39.53-Cement grade	Global Lab and Consultancy Services, Salem	NABL accredited	3032.xlsx

* Chemical analysis of core /non vore samples may be uploaded in CSV file which shall normally include Five files namely collar file, survey file and Geology log file, Assay file & RQD File.

2A.2.1.11: Petrology & Mineralogical Studies

SI.No.	Type of Sample	Number of Sample Drawn	Number of Sample Analyzed	Petrographic Study Report
1	None	0	0	Nil

2A.2.1.12: Beneficiation Studies

SI.No.	Type of Beneficiation	Number of Samples	Attach
1	Nil	0	Nil

2A.2.1.13: Bulk Density Study as per M(EMC) Rules, 2015 and SOP of CGPB

Method adopted for calculating bulk density of ore and waste

The lessee collected samples from the different areas in existing mining pit and after coning and quartering, one representative sample was analyzed in NABL Laboratory to find out the chemical and physical properties of the limestone mineral. Based on the analysis, it revealed that the limestone mineral is of grade suitable for cement industries. The bulk density has been reckoned as 2.6.

Sl.No.	Nature of Ore/OB	Mineral	Number of samples	Bulk Density Established (t/m ³)
1	Ore and OB	Limestone	2	2.60

2A.2.1.14: Area Covered under Exploration

Level of exploration	Area in Ha.		Total Area in Ha.
	Forest	Non Forest	
G-1	0.000000	1.440000	1.440000
G-2	0.000000	0.000000	0.000000
G-3	0.000000	0.000000	0.000000
G-4	0.000000	0.000000	0.000000
Area proved as Non-mineralized	0.000000	1.075000	1.075000
Area to be explored	0.000000	0.000000	0.000000
Total	0.000000	2.515000	2.515000

2A.2.2: Summary of The Previous Exploration (Before Last Plan Period)

Name of The Agency

Geo Exploration and Mining Solutions, Salem & Global Lab and Consultancy Services, Salem.

2A.2.2.1: Geological Mapping

Sl.No.	Year		Scale	Area Covered (Ha)
	From	To		
1	12/11/1998	11/11/2018	1:1000	2.52

2A.2.2.2: Airborne Geophysical Survey

SI.No.	Type of Survey	Spacing (m)	Total line (km)	Area Covered (Ha)	Latitude (dd:mm:ss.ss)		Longitude (dd:mm:ss.ss)	
					From	To	From	To
1	NIL	0.00	0.000000	0.00	Nil	Nil	Nil	Nil

2A.2.2.3: Ground Geophysical Survey

SI.No.	Type of Survey	Spacing (m)	Total line (km)	Area Covered (Ha)	Latitude (dd:mm:ss.ss)		Longitude (dd:mm:ss.ss)	
					From	To	From	To
1	NIL	0	0	0.0000	Nil	Nil	Nil	Nil

2A.2.2.4: Geochemical Survey

SI.No.	Type of Sample	No of Samples
1	Nil	0

2A.2.2.5: Pitting

SI.No.	Pit ID	Length of Pit (m)	Width of Pit (m)	Depth of Pit (m)	Litho units exposed	Litho Unit From (m)	Litho Unit To (m)	Average Grade(%)	Running Metres (m)	Latitude (dd:mm:ss.ss)		Longitude (dd:mm:ss.ss)	
										Form	To	Form	To
1	Nil	0.00	0.00	0.00	0	0.00	0.00	0.00	0.00	Nil	Nil	Nil	Nil

2A.2.2.6: Trenching

Number of Trenches
0

Spacing

Min (m)	Max (m)	Avg (m)
0.00	0.00	0.00

Area Covered Under Trenching**Co-ordinates****Latitude**

North	Nil
North	Nil
North	Nil
North	Nil

Longitude

East	Nil
East	Nil
East	Nil
East	Nil

SI.No.	Trench ID	Length of Trench (m)	Width of Trench (m)	Depth of Trench (m)	Litho Units Exposed	Average Grade	Running mtr	Latitude (dd:mm:ss.ss)		Longitude (dd:mm:ss.ss)	
								From	To	From	To
1	Nil	0.0000	0.0000	0.0000	0	0	0.0000	Nil	Nil	Nil	Nil

2A.2.2.7: Exploratory Drilling**2A.2.2.7.1: Core/Non-core Drilling**

SI.No.	Year		Exploration agency	Core holes		Non-core (RC/DTH)		Grand total		Attach log sheet of each borehole in csv/excel format
	From	To		Number of boreholes drilled	Total mtrs	Number of boreholes drilled	Total mtrs	Total boreholes	Total mtrs	
1	19/03/2018	24/03/2018	Geo Exploration and Mining Solutions, Salem	6	131.00	0	0.00	6	131.00	drilled boreholes.xlsx

2A.2.2.8: Exploratory Mining

SI.No.	Pit / Adit ID	Volume (m ³)
1	Nil	0.00

2A.2.2.9: Sampling

SI.No.	Type of sample	Number of Samples	Area Covered (Ha)	Latitude (dd:mm:ss.ss)		Longitude (dd:mm:ss.ss)	
				From	To	From	To
1	Others	1	2.52	10:45:48.79	10:45:48.79	78:16:50.29	78:16:50.29

2A.2.2.10: Chemical Analysis

SI.No.	Sample ID	Minerals	Radical Analysis	Attachment
1	GLCS/TR/792/2018-19	Limestone	CaO-48.42 MgO-1.13 SiO ₂ -7.28 Fe ₂ O ₃ -0.44 Al ₂ O ₃ -1.03 LOI-41.70	16_16A_Chemical_Analysis_Report.pdf

2A.2.2.11: Petrology & Mineralogical Studies

SI.No.	Type of Sample	Number of Sample Drawn	Number of Sample Analyzed	Petrographic Study Report
1	None	0	0	Nil

2A.2.2.12: Beneficiation Test

SI.No.	Type of Beneficiation	Number of Samples	Attachment
1	Nil	0	Nil

2A.2.2.13: Bulk Density

SI.No.	Rock Type	Number of Samples	Minerals	Bulk Density Established (t/m ³)
1	Nil	0	Nil	0.00

2A.2.2.14: Area Covered under Exploration

Level of exploration	Area in Ha.		Total Area in Ha.
	Forest	Non Forest	
G-1	0.0000	1.4400	1.4400
G-2	0.0000	0.0000	0.0000
G-3	0.0000	0.0000	0.0000
G-4	0.0000	0.0000	0.0000
Area proved as Non-mineralized	0.0000	1.0750	1.0750
Area to be explored	0.0000	0.0000	0.0000
Total	0.0000	2.5150	2.5150

SI.No.	Year		Area converted to G1 from G2, G3 & G4	% increase in G-1 Area	Remaining Area % in G2	Remaining Area % in G3	Remaining Area % in G4	Remaining Area in G2	Remaining Area in G3	Remaining Area in G4
	From	To								
1	19/03/2018	24/03/2018	1.44	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Potentially Mineralised area (Ha)										1.44

2A.2.3 Ore Body Geometry & Grade

SI.No.	Name of the ore band	General Strike / Trend	Dip Of Mineral Body	Average Strike Length (m)	Average Width (m)	Chemical parameters				
						Average Depth (m)	Name of the radical	Min Grade (%)	Max Grade (%)	Avg Grade (%)
1	Limestone band	NE-SW	SE	220.00	68.00	33.00	CaO	47.00	48.00	47.50

2A.2.4: Reserve / Resource Estimation Method

2A.2.4.1: Methodology

Resource / Reserve Estimation Method
Sectional Area Method
Methodology
<p>The estimation of mineral reserves is done by plan area method. For Reserve calculation the length and width of the deposit is shown in the Geological plan & cross sections. (Please plate Ref. 3 and 4). The length in m (L) and width in m (W) is multiplied to get Area(in sqm). Then the area is multiplied with the Depth in m (D) which gives the Volume. Then the volume is multiplied with the Bulk density which gives the reserves in tonnes. In short - $L(m) \times W(m) \times D(m) = \text{Volume(cum)} \times \text{Bulk density(in tonnes/cum)} = \text{ROM(Ts)}$. During the previous approved plan period 60% recovery was discussed and the same 60% recovery of limestone is given in the present plan period also. The bulk density has been reckoned as 2.6. Remaining 40% is mineral reject. This is a running mine and the bulk density varies from 2.4 to 2.6. Therefore, we have assumed 2.6 as the bulk density. The bulk density and the recovery percentage are given based on the knowledge gained from the past mine workings, present mine workings and the adjacent working mine in this region. The mine has reached maximum 18m depth and based on the existing pits and drilled core drills, the depth of the mineralization has been proved upto 33m with an average of 1m topsoil in the lease area. Hence, the reserves and resources are estimated upto 33m depth during the Present Plan Period.</p>

2A.2.4.2: Resource Calculation

SI.No.	Cross Section/Block	Section Area/ Block Area(sq mt)	Influence(m)	Depth in mtr	Volume (m ³)	Bulk Density (t/m ³)	Resource Quantity (t)	Level of Exploration	Type of Land	Name of the radical	Grade (%)	Method used for resource estimation
1	XY AB TO XY GH	3685	50.00	32.00	117920.00	2.60	306592.00000	331	non-forest	CaO	47.5	Cross section
2	XY AB TO XY GH	3342	50.00	32.00	106944.00	2.60	278054.40000	331	non-forest	CaO	47.5	Cross section
3	Safety barrier seven	3433.56	50.00	32.00	109873.92	2.60	285672.19000	331	non-forest	CaO	47.5	Cross section

point five										
Total		334737.92		870318.5900		0				

2A.2.4.3: Mineral Resource Estimate for Conversion to Mineral Reserve

The mineral resources estimated is converted to mineral reserve by excluding mineral blocked in benches and in safety barrier. The mineral reserves is categorized as 111 and the mineral resources is categorized as 221.

2A.2.4.4: Threshold value & Cut off Parameters

Threshold value: Radicals- MgO-5(max), CaO-34(min) Cut off value- MgO-5(max), CaO-34(min), Fe₂O₃-1.5 (max), SiO₂-9%(max), LOI -43(max), Al₂O₃-1.5 %(max)

2A.2.4.5: Mining Factors or Assumptions

It is a mining factors only not for assumption, based on the existing pits and Drilled boreholes the availability of reserves and resources are estimated.

2A.2.4.6: Metallurgical Factors or Assumptions

It is a mining factors only not for assumption, based on the existing pits and Drilled boreholes the availability of reserves and resources are estimated.

2A.2.4.7: Cost & Revenue Factors

S. No. Particulars Cost of production Per ton (Rs.) 1 Labour charges 125 2 Royalty paid to Mines & Geology 80 3 National Mineral Exploration Trust 3 4 District Mineral Foundation (DMF)-30% of royalty 24 5 Explosives expenses 45 6 Drilling expenses 27 7 Transport from mine head to Stockyard (loading & unloading) 18 Total 322 8 Miscellaneous and over heads 55 Total 377 The cost of production is Rs. 377/ton. Hence, the mining is economically viable at present market conditions. The method of mining is by open cast method; excavator will be deployed for the formation of benches and loading. Excavator attached with rock breaker will be deployed for breaking and fragmentation to avoid blasting as the strata is medium hard in nature. Jackhammers with compressors will be deployed for drilling. Manual labours will be engaged for jackhammer drilling, sorting of waste. Blasting will be carried out occasionally with controlled initiation system. Since it is an opencast mining, spades, axes, shovels and loose tools are engaged. Rental cost of excavators per month 4 No. : Rs.8,00,000/- Rental cost of tippers per month 3 Nos. : Rs.1,50,000/- Rental cost of drilling machines per month 4 Nos. : Rs.2,00,000/- Loose tools : Rs.70,000/- The capital cost will be around Rs.12,20,000/- and the working capital will not exceed more than Rs.14,00,000/-.

2A.2.4.8: Market Assessment

The entire mined out mineral is being sold to the nearby cement and lime based industries which are located within a radius of 30km to 40km from the mine site.

2A.2.4.9: Other Modifying Factors

Nil

2A.2.4.10: Classification

The Reserves and Resources were assessed based on the United Nations Framework Classifications as Amended in the Mineral Conservation and Development Rules (Second Amendment) Rules 2003 and in exercise of the powers conferred by section 18 of the Mines and Minerals (Development and Regulations) Act 1957(67 of 1957) and Subsequently to the CCOM Circular No.4, 2009, dated 21.10.2009.

2A.2.4.11: Calculation of blocked resources

Sl.No.	Reserves blocked due to	Cross section/Block	Sectional area/ block area (in Sq mtr)	Influence (m)	Depth (m)	Volume (m ³)	Bulk Density (t/m ³)	Resource Quantity (t)	UNFC code	Type of Land	Name of the radical	Grade (%)	Method used for resource estimation
1	Other	XY AB	12340.96	50.00	32.00	49363.84	2.60	128345.98000	221	Non-Forest	CaO	47.5	Cross Section
2	Other	XY CD	2697.02	50.00	32.00	10788.08	2.60	28049.01000	221	Non-Forest	CaO	47.5	Cross Section
3	Other	XY EF	2295.00	50.00	32.00	9180.00	2.60	23868.00000	221	Non-Forest	CaO	47.5	Cross Section
4	Other	XY GH	9402.98	50.00	32.00	37611.92	2.60	97790.99000	221	Non-Forest	CaO	47.5	Cross Section
5	7.5 Meter Safety Barrier	Safety barrier seven point five	3433.56	50.00	32.00	109873.92	2.60	285672.19000	221	Non-Forest	CaO	47.5	Cross Section
Total						216817.76		563726.17					

2A.2.4.12: Calculation of Reserves - I

Sl.No.	Cross section/Block	Sectional area/ block area (in Sq mtr)	Influence (m)	Depth (m)	Volume (m ³)	Bulk Density (t/m ³)	Resource Quantity (t)	UNFC code	Type of Land	Name of the radical	Grade (%)	Method used for resource estimation
1	XY AB	5992.02	50.00	32.00	23968.08	2.60	62317.01	111	Non-Forest	CaO	47.5	Cross Section
2	XY CD	18785	50.00	32.00	75140.00	2.60	195364.00	111	Non-Forest	CaO	47.5	Cross Section
3	XY EF	1815.96	50.00	32.00	7263.84	2.60	18885.98	111	Non-Forest	CaO	47.5	Cross Section
4	XY GH	2887.02	50.00	32.00	11548.08	2.60	30025.01	111	Non-Forest	CaO	47.5	Cross Section
Total					117920.00		306592.00					

2A.2.4.13: Calculation of Reserves -II

Mineral	LIMESTONE
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Reserves/ Resources estimated as on	01/04/2023
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UNIT of estimation	tonnes
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A. Mineral Reserve

Classification	Code	Quantity			Grade		Remark
		Forest	Non Forest	Total	Forest	Non Forest	
1. Proved Mineral Reserve (A)	111	0.00	306592.00	306592.00	0	Cement	Nil
2. Probable Mineral Reserve (A)	121	0.00	0.00	0.00	0	0	Nil

3. Probable Mineral Reserve (A)	122	0.00	0.00	0.00	0	0	Nil
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B. Remaining Resources

Classification	Code	Quantity			Grade		Remark
		Forest	Non Forest	Total	Forest	Non Forest	
1. Feasibility Mineral Resource (B)	211	0.00	0.00	0.00	0	0	Nil
2. Prefeasibility Mineral Resource (B)	221	0.00	563726.00	563726.00	0	Cement	Nil
3. Prefeasibility Mineral Resource (B)	222	0.00	0.00	0.00	0	0	Nil
4. Measured Mineral Resource (B)	331	0.00	0.00	0.00	0	0	Nil
5. Indicated Mineral Resource (B)	332	0.00	0.00	0.00	0	0	Nil
6. Inferred Mineral Resource (B)	333	0.00	0.00	0.00	0	0	Nil
7. Reconnaissance Mineral Resource (B)	334	0.00	0.00	0.00	0	0	Nil
Total Mineral Resources (A+B) :				870318.00			

2A.2.4.13: Calculation of Reserves -III

No associate minerals are available!

2A.2.5: Future Exploration Proposal

2A.2.5.1: Geological Mapping

Sl.N.	Year	Scale	Area Covered (Ha)
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1	2023-2024	1:1000	2.52
2	2024-2025	1:1000	2.52
3	2025-2026	1:1000	2.52
4	2026-2027	1:1000	2.52
5	2027-2028	1:1000	2.52

2A.2.5.2: Ground Geophysical Survey

Sl.No.	Year	Type of Survey	Spacing (m)	Total line (km)	Area Covered (Ha)	Latitude (dd:mm:ss.ss)		Longitude (dd:mm:ss.ss)	
						From	To	From	To
1	Nil	NIL	0	0	0.0000	Nil	Nil	Nil	Nil

2A.2.5.3: Pitting

Number of Pits									
0									

Sl.No.	Year	Land Type	Pit ID	Length of Pit (m)	Width of Pit (m)	Depth of Pit (m)	Latitude (dd:mm:ss.ss)		Longitude (dd:mm:ss.ss)	
							From	To	From	To
1	Nil	Nil	Nil	0.00	0.00	0.00	Nil	Nil	Nil	Nil

2A.2.5.4: Trenching

Number of Trenches									
0									

2A.2.5.4.1: SPACING

Min (m)	Max (m)	Avg (m)
0.00	0.00	0.00

2A.2.5.4.2: Area Covered Under Trenching**Co-ordinates**

SI.No.	Year	Land Type	Trench ID	Length of Trench (m)	Width of Trench (m)	Depth of Trench(m)	Latitude (dd:mm:ss.ss)		Longitude (dd:mm:ss.ss)	
							From	To	From	To
1	Nil	Nil	Nil	0.0000	0.0000	0.0000	Nil	Nil	Nil	Nil

2A.2.5.5: Exploratory Drilling**2A.2.5.5.1: Core Drilling & Non-Core Drilling**

SI.No.	Year	In Forest Area				In Non Forest Area				Total Borehole	Total Meter
		No. of Borehole	Total Mtr	Type Borehole	Grid Interval	No. of Borehole	Total Mtr	Type Borehole	Grid Interval		
1	2023-2024	0	0.00	Nil	0.00	5	149.00	Core	50.00	5	149.00

2A.2.5.6: Exploratory Mining

SI.No.	Year	Pit ID	Length in meter	Width in meter	Depth in meter	Volume (m ³)
1	Nil	nil	0.00	0.00	0.00	0.00

2A.2.5.7: Sampling

SI.No.	Year	Type of Sample	Number of Samples Proposed	Area Covered(Ha)	Latitude (dd:mm:ss.ss)		Longitude (dd:mm:ss.ss)	
					From	To	From	To
1	2023-2024	Others	5	2.52	10:45:48.56	10:45:48.56	78:16:49.30	78:16:49.30

2A.2.5.8 Petrographic & Mineralgraphic Studies

Sl.No.	Year	Type of Sample	Number of Samples Proposed
1	Nil	None	0

Approved

Chapter 2B : Geology & Exploration UG : NA

Approved

Chapter 3: Mineral Beneficiation / Processing

Name of The Ore/Mineral	Limestone
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3.1: Mineralogy of the ROM ore/ Mineral

SI.No	Valuable Mineral Name	Approx. Mineral %	Gangue Mineral/s name	Approx. Mineral Gangue %
1	Limestone	60.0000	mineral rejects	40.0000

3.2: Complete Chemical Analysis of the ROM Ore/Mineral

SI.No	Radical	Wt%
1	CaO	47.9500
2	MgO	1.2500
3	SiO	8.5600
4	FeO	0.5600
5	AlO	1.2700
6	LOI	39.8200

3.3: Crushing Section

3.3.1: Primary Crushing

Not Applicable

3.3.2: Secondary Crushing

Not Applicable

3.3.3: Tertiary Crushing

Not Applicable

3.4: Grinding Section

3.4.1: Dry Grinding

Not Applicable

3.4.2: Wet Grinding

Not Applicable

3.5: Dry Processing

3.5.1: Screening and Classification

Not Applicable

Approved

3.5.2: Other Operations

Not Applicable

3.5.3: Product Quality

Not Applicable

3.6: Wet Processing**3.6.1: Scrubbing / Washing**

SI.No	Type of Scrubbers / washers	Stages, if applicable	Make	Capacity(tph)	Feed Size(mm)	Product Size (mm)	Product Quality, if available	Water Requirement(l/h)	Fresh Water Requirement (l/h)	Recirculated Water (l/h)
1	Nil	Not applicable	0	0.0000	0.0000	0.0000	0	0.0000	0.0000	0.0000

3.6.2: Screening and Classification

SI.No	Type of screen / classifiers	Stages, if applicable	Make	Capacity(tph)	Aperture Size of Screen/Classifier (mm), if applicable	Feed Size(mm)	Product Size (mm)	Product Quality, if available	Water Requirement(l/h)	Fresh Water Requirement (l/h)	Recirculated Water (l/h)
1	Nil	Not applicable	Nil	0.0000	0.0000	0.0000	0.0000	0	0.0000	0.0000	0.0000

3.6.3: Gravity Separation

SI.No	Type of separators	Stages, if applicable	Make	Capacity(tph)	Feed Size(mm)	Product (Conc) (tph)	Product-Mid (tph), if	Product-Tail (tph)	Water Requirement(l/h)	Fresh Water Requirement	Recirculated Water (l/h)
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	(jig, table, spiral, etc.)						available			(l/h)	
1	Nil	Nil	0	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

3.6.4: Magnetic Separation

SI.No	Type of magnetic separators (magnetic intensity)	Stages, if applicable	Make	Capacity(tph)	Feed Size(mm)	Product-Mag (tph)	Product-Mid (tph), if available	Product non-Mag (tph)	Water Requirement(l/h)	Fresh Water Requirement (l/h)	Recirculated Water (l/h)
1	Nil	Nil	Nil	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

3.6.5: Flotation

SI.No	Type of flotation equipment (froth/ column)	Stages (rougher/ cleaner, etc), if applicable	Make	Capacity(tph)	Feed Size(mm)	Product-Float (tph)	Product non-Float (tph)	Water Requirement(l/h)	Fresh Water Requirement (l/h)	Recirculated Water (l/h)
1	Nil	Nil	Nil	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

3.6.6: Other Operations

SI.No	Type of equipment / operation	Stages, if applicable	Make	Capacity(tph)	Feed Size(mm)	Product-Conc (tph)	Product-Mid (tph), if available	Product-Tail (tph)	Water Requirement(l/h)	Fresh Water Requirement (l/h)	Recirculated Water (l/h)
1	Nil	Not applicable	Nil	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

3.6.7: Product Quality (wet processing)

Products	Wt%	In Tonnes	Size (Range) mm	Complete chemical analysis
Concentrate	0.0000	0.0000	0	0
Sub-grade	0.0000	0.0000	0	0
Rejects	0.0000	0.0000	0	0

3.7: Overall Product Quality (Dry cum Wet Processing)

Products	Wt%	In Tonnes	Size (Range) mm	Complete chemical analysis
Concentrate	0.0000	0.0000	0	0
Sub-grade	0.0000	0.0000	0	0
Rejects	0.0000	0.0000	0	0

3.8: Disposal Method for tailing/ rejects

a) Explain the disposal method for tailing or reject from processing plant with detail chemical / mineral analysis of tailing	Nil
b) Size and capacity of tailing pond, toxic effect of such tailings, process adopted to neutralise its effect (if any)	Nil
c) Any other data (if available)	Nil

3.9: Overall water requirement of mining and mineral processing

Indicate quantity, source of supply, disposal of water and extent of recycling and chemical analysis of water	Nil
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3.10: Flow sheets and charts

Material balance chart of mineral processing plant(s) (each stage of process)	Nil
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Attach flow sheet of beneficiation of plant(s)	Nil
Any other data (if applicable)	Nil

Approved

Chapter 4A: Mining Operations

4A.1.1: Existing Method of Mining					Mechanized				
Choose one or more	Combination of loaders and tippers	Combination of loaders and tippers	Combination of loaders and tippers	Combination of loaders and tippers					
4A.1.2: Proposed Method of Mining					Mechanized				
Choose one or more	Combination of loaders and tippers	Combination of loaders and tippers	Combination of loaders and tippers	Combination of loaders and tippers					
Reasons for Proposed Changes					No change in proposed method				

4A.2: Operational Parameters

4A.2.1: Inventory of Existing Pits & Dumps

4A.2.1.1: Pits

SI.No.	Pit ID	Pit Status	Area Covered by Pit(Ha)	Pit Dimensions(L*W*D)
1	Existing pit-1	Active	1.24	173*72*18

4A.2.1.2: Dumps and Stacks

4A.2.1.2.1: Dump Details

SI.No.	Dump ID	Dump Status	Type of Dump	Total of Dump	Area Covered	Height(m)	Latitude (dd:mm:ss.ss)	Longitude (dd:mm:ss.ss)
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				Quantity(t)	by Dump(Ha)		From	To	From	To
1	Existing M.R, S.B, T.S Temporary Dump	Active	Waste	21256.00	0.32	6.60	10:45:49.70	10:45:48.41	78:16:45.46	78:16:46.60

4A.2.1.2.2: Stack Details

SI.No.	Stack ID	Type of Stack	Total Stack of Quantity(t)	Area Covered by Stack(Ha)	Height(m)	Latitude (dd:mm:ss.ss)		Longitude (dd:mm:ss.ss)	
						From	To	From	To
1	St-1	Stack for mineral	175.5	0.01	0.5	10:45:47.04	10:45:47.50	78:16:47.04	78:16:47.34
2	St-2	Stack for mineral	312	0.01	1	10:45:46.28	10:45:46.63	78:16:46.94	78:16:47.22
3	St-3	Stack for mineral	65	0.01	0.5	10:45:46.04	10:45:46.19	78:16:47.01	78:16:47.34

4A.2.1.3: Details of stabilised dumps

SI.No.	Dump ID	Number of Terraces	Average Height of Terraces(m)	Lenght of Toe Wall(m)	Lenght of Garland Drain(m)	Area Stablized(Ha)	Method of Stablization
1	Nil	Nil	0.00	0.00	0.00	0.00	Nil

4A.2.2: Opencast Mining**4A.2.2.1: Bench Parameters**

Pit ID	Year	Max Height of the Benches in Over Burden (m)	Min Width of the Benches in Over Burden (m)	Slope of the Bench in Over Burden (degree)	Max Height of the Benches in Mineral (m)	Minimum Width of the Benches in Mineral (m)	Slope of the Bench in Mineral (degree)	Overall Slope of Pit (degree)	Number of Benches in Top Soil	Number of Benches in Over Burden	Number of Benches in Mineral	Max Depth of Workings (m)	Depth of Water Table (mRL)	Max Slope Angle of Haul Roads (1xx in)
1	2023-2024	4.00	6.00	60.00	4.00	6.00	60.00	27.00	1	3	7	29.00	45.00	01:16

1	2024-2025	4.00	6.00	60.00	4.00	6.00	60.00	27.00	1	5	7	29.00	45.00	01:16
1	2025-2026	4.00	6.00	60.00	4.00	6.00	60.00	27.00	1	2	2	9.00	45.00	01:16
1	2026-2027	4.00	6.00	60.00	4.00	6.00	60.00	27.00	0	3	3	12.00	45.00	01:16
1	2027-2028	4.00	6.00	60.00	4.00	6.00	60.00	27.00	0	1	4	16.00	45.00	01:16

4A.2.2.2: Yearwise Opencast Development - I Continue

SI.No.	Year	Pit ID	Bench	Direction	Bulk Density of Overburden (BD1) (ton/m ³)	Bulk Density of Mineral (BD2) (tonn/m ³)	Top Soil Volume (Length x Width x Height) (m ³)	Over Burden Volume (Length x Width x Height) (m ³)	Over Burden Quantity (t)	ROM Volume (Length x Width x Height) (m ³)	ROM Quantity (t)	Recovery	Mineral Reject (t)	Production Main (t)	Production Associated (t)	OB Ratio to Ore (m ³ /ton)
1	2023-2024	1	I to VIII	E-W	2.60	2.60	808.00	2063.85	5366.00	19676.15	51158.00	0.60	20463.20	30694.80	0.00	24.7877
2	2024-2025	1	I to VIII	E-W	2.60	2.60	3872.00	9451.92	24575.00	49091.92	127639.00	0.60	51055.60	76583.40	0.00	13.5040
3	2025-2026	1	I to III	E-W	2.60	2.60	4032.00	5616.15	14602.00	17588.08	45729.00	0.60	18291.60	27437.40	0.00	8.1424
4	2026-2027	1	III to V	E-W	2.60	2.60	0.00	2496.15	6490.00	17735.77	46113.00	0.60	18445.20	27667.80	0.00	18.4736
5	2027-2028	1	VI to IX	E-W	2.60	2.60	0.00	1320.00	3432.00	13828.08	35953.00	0.60	14381.20	21571.80	0.00	27.2371
Total									54465.00		306592.00		122636.80	183955.20	0.00	

4A.2.2.2 Yearwise Opencast Development - I End

SI.No.	Year	Pit ID	Total Topsoil Volume (m ³)	Total Over Burden Volume (m ³)	Total Over Burden Quantity (t)	Total ROM Volume (m ³)	Total ROM Quantity (t)
1	2023-2024	1	808.00	2063.84	5366.00	19676.15	51158.00

2	2024-2025	1	3872.00	9451.92	24575.00	49091.92	127639.00
3	2025-2026	1	4032.00	5616.15	14602.00	17588.07	45729.00
4	2026-2027	1	0.00	2496.15	6490.00	17735.76	46113.00
5	2027-2028	1	0.00	1320.00	3432.00	13828.07	35953.00
Total			8712.00	20948.06	54465.00	117919.97	306592.00

4A.2.2.3: Transportation & Hauling Equipment

SI.No.	Type	Make	Capacity (m ³)	No. of Equipments
1	Tipper	Ashok Leyland	8.00	3

4A.3: Material Handling Summary

4A.3.1: Studies Undertaken

Title	Study Undertaken	Attachment (only pdf allowed)
Blast Vibration Study Report	No	Nil
Slope Stability Study Report	No	Nil
Recovery Study Report	No	Nil
Hydrological Study Report	No	Nil
Mineral Beneficiation Study Report	No	Nil
Subsidence Study Report	No	Nil
Geotechnical Study Report	No	Nil
Any Other Study Report	No	Nil
Bulk Density Study Report	No	Nil

4A.3.2: Insitu Mining

SI.No.	Year	Waste Quantity(t)	ROM Quantity(t)	Total Handling (t)	ROM Quantity Saleable Mineral (t)	ROM Quantity Mineral Reject (t)	OB Ratio to Ore (Waste Quantity / ROM Quantity)	Grade Range (%)
1	2023-2024	5366.00	51158.00	56524.00	30694.80	20463.20	9.53	47.5
2	2024-2025	24575.00	127639.00	152214.00	76583.40	51055.60	5.19	47.5
3	2025-2026	14602.00	45729.00	60331.00	27437.40	18291.60	3.13	47.5
4	2026-2027	6490.00	46113.00	52603.00	27667.80	18445.20	7.11	47.5
5	2027-2028	3432.00	35953.00	39385.00	21571.80	14381.20	10.48	47.5
	Total	54465.00	306592.00	361057.00	183955.20	122636.80		

4A.3.3: Dump workings

SI.No.	Year	Dump ID	Latitude (dd:mm:ss.ss)		Longitude (dd:mm:ss.ss)		Area (m2)	Avg Height of Dump (m)	Volume (m ³)	Total Dump Quantity (t)	Proposed Dump Handling Quantity (t) (A)	Proposed Recovery of Saleable Mineral (t)(B)	Proposed Waste Quantity (t) (A-B)	Grade Range (%)	Justification
			From	To	From	To									
1	Nil	Nil	Nil	Nil	Nil	Nil	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0	Nil

4A.3.4: Calculation Summary

Year	2023-2024	2024-2025	2025-2026	2026-2027	2027-2028	Total
(A) Total ROM quantity (t)	51158.00	127639.00	45729.00	46113.00	35953.00	306592.00
(B) Saleable ore from ROM (t)	30695.00	76583.00	27437.00	27668.00	21572.00	183955.00
(C) Proposed Dump Handling Quantity (t)	0.00	0.00	0.00	0.00	0.00	0.00
(D) Saleable Ore	0.00	0.00	0.00	0.00	0.00	0.00

recovered from dump workings (t)						
(E) Total Saleable Ore (t)=(B+D)	30695.00	76583.00	27437.00	27668.00	21572.00	183955.00
(F) Total Quantity Handled (t)=(A+C)	51158.00	127639.00	45729.00	46113.00	35953.00	306592.00

4A.4: Machine Calculation

4A.4.1: Machine Requirement Summary

Number of Average Working Days in One Year (A)	300
Number of Shifts per Day (B)	1
Material Handling Required per Day (t) ((D)=Largest of (Q1,Q5)/(A))	241
Material to be Handled per Shift (t) ((E)=(D)/(B))	241
Handling Required per Hour (t) ((F)=(E)/8 hours)	30
Effective Shift Time	7 hrs 00 mins

4A.4.2: Shovel / Excavator Requirement

Effective Shift Time		7 hrs			00 mins									
Sl.No.	Type	Bucket Capacity (m ³)(A)	Bucket Fill Factor (B)	Swell Factor (C)	Tonnage Factor (t/m ³) (D)	Machine Utilization Factor (%) (U)	Efficiency (%) (E)	Cycle time (sec) (F)	(G) TPH =TPH (G) =((3600 x A x B x C x D x E x U) / F)	Total Hours (H) =Number of working days x Number of shifts/day x Effective shift hours	Yearly handling by one Excavator (t) (I)=(G x H)	Maximum handling of the material by this machine during the block period (t) (J)	Number of excavator machines required (K) = (J / I)	Standby excavator (L)

1	Excavator-Tata Hitachi	1.90	0.9	0.7	0.60	0.80	0.70	30	48.26	2100	101346.00	361057.00	3.56	1
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4A.4.3: Dumper Requirement

Effective Shift Time					7 hrs					00 mins				
Sl.No.	Total Hours=Number of working days (W)x Number of shifts/day x Effective shift hours (Machine Requirement Summary) (A)	Capacity of Dumpers (t) (B)	Speed of the dumper (KMPH) (i)	Lead Distance (KM) (ii)	Time taken to cover distance in minutes(iii) = (ii/i) x 60	Queuing, Loading Time at Shovel (min) (iv)	Queuing, Unloading Time during unloading (min) (v)	Total Time to complete one trip(vi) = (iii + iv + v)	No. of Trips / hr = (60 / vi)	Total transportation per hour = (B X vii)	Yearly handling by one dumper (ix) = A x TPH	Maximum handling of the material by this machine during the block period (t) (x)	Number of dumpers will be (xi) = (x / ix)	Plus Standby dumper (xii)
1	2100	0.00	0.00	0.00	0.00	0.00	0.00	0.00	Nil	0	0.00	0.00	0	0

4A.4.4: Drill Machine Requirement

Effective Shift Time					7 hrs					00 mins				
Sl.No.	Type of Drill	Depth of Hole(including Sub-grade Drilling) (m)	Spacing (m)	Burden (m)	Bulk Density of Waste (t/m ³)	Bulk Density of Mineral (t/m ³)	Yield per Hole (t)	Yield per Meter (t/m) = Yield per Hole (t)/Depth	Annual Target Known (t)	Drilling Requirement per Day (m) = (Annual Target	Drilling Requirement per Shift (m)	Rate of Drilling per Hours (m/hr) = Drilling Requirement	Required No. of drills (m/c) = Required rate of drilling in	Stand by Drill

								of Hole(in cluding Sub-grade Drilling (m))		Known (t) / Yield per Meter (t/m))/Number of Average Working Days in One Year (A)		per Shift (t (m)/Effecti ve Shift Time	meters per hr./ Actual rate of drilling in meters per hr of the machine deployed	
1	Mechanica 1	1.65	1.40	0.90	2.60	2.60	3.00	1.81	72211.00	132.99	132.99	6.00	3.16	1

4A.4.5: Machine Deployment Details

4A.4.5.1: Excavator & Loading Equipment

SI.No.	Type	Make	Capacity (m ³)	No. of Equipments
1	Excavator	Tata Hitachi	1.90	4

4A.4.5.2: Dozers Details

SI.No.	Type	Make	Capacity (hp)	No. of Equipments
1	Dozer BD65-1	BEML	3.60	1

4A.4.5.3: Drilling Details

SI.No.	Type	Make	Capacity (t)	Diameter of Hole(mm)
1	Mechanical	Atlas Copco	1.81	35.00

4A.5 Blasting Requirement

4A.5.1: Blasting & Explosive Requirement in Waste/Development

SI.No.	Drill Pattern / Spacing of Holes (m)	Burden of Holes (m)	Number of Rows / Rings	Yield per Holes in Waste (m ³)	Frequency of Blasting in a Week	Maximum Number of Holes Blasted in a Round	Charge per Hole (kg)	Charge per Round (kg)	Explosive Requirement Per Month in Development (kg)	Powder Factor in Development / Waste (t/kg)	Depth Of Hole
1	1.4	0.9	2	1	2	20	0.5	10	225	0.16	1.65

4A.5.2: Blasting & Explosive Requirement in Mineral / Ore

Type of Explosive	Type of Explosives used / to be Used
Slurry Explosives	Aluminised Gelled Slurry Explosives (Large Diameter)

SI.No.	Total ROM proposed to be handled in CUM/annum	Total ROM proposed to be handled in CUM/day	Spacing of Holes (m)	Burden of Holes (m)	Number of Rows	Yield per Holes in ROM Zone (m ³)	Frequency of Blasting in a Week	Maximum Number of Holes Blasted in a Round	No of Holes Required to be Blasted per Round	Charge per Hole (kg)	Charge per Round (kg)	Explosive Requirement Per Month for ROM Zone Blasting (kg)	Powder Factor in Ore (t/kg)	Pop Shooting (no of Boulders)	Plaster Shooting (no of Boulders)	Use of Rockbreaker	Capacity	Secondary Blasting Requirements	Depth Of Hole
1	23585.00	78.61	1.4	0.9	2	1	2	20	20	0.5	10	850	0.167	0	0	2	0	yes	1.65

4A.6: Man Power Deployment**4A.6.1: Managerial**

SI.No.	Particular	Number of Persons in Shift 1	Number of Persons in Shift 2	Number of Persons in Shift 3	Number of Persons in General Shift	Total No. of Persons per day
1	Mining Engineer	0	0	0	1	1

2	Geologist	0	0	0	1	1
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4A.6.2: Supervisory

SI.No.	Particular	Number of Persons in Shift 1	Number of Persons in Shift 2	Number of Persons in Shift 3	Number of Persons in General Shift	Total No. of Persons per day
1	Foreman	0	0	0	1	1
2	Blaster	0	0	0	1	1

4A.6.3: Skilled Workers / Operators

SI.No.	Particular	Number of Persons in Shift 1	Number of Persons in Shift 2	Number of Persons in Shift 3	Number of Persons in General Shift	Total No. of Persons per day
1	Other	0	0	0	3	3
2	Operator	0	0	0	4	4
3	Drill Operator	0	0	0	8	8
4	Other	0	0	0	1	1

4A.6.4: Semi-skilled Workers

SI.No.	Number of Persons in Shift 1	Number of Persons in Shift 2	Number of Persons in Shift 3	Number of Persons in General Shift	Total No. of Persons per day
1	0	0	0	3	3

4A.6.5: Unskilled Workers

SI.No.	Number of Persons in Shift 1	Number of Persons in Shift 2	Number of Persons in Shift 3	Number of Persons in General Shift	Total No. of Persons per day
1	0	0	0	8	8

4A.6.6: Others Specify

SI.No.	Particular	Number of Persons in Shift 1	Number of Persons in Shift 2	Number of Persons in Shift 3	Number of Persons in General Shift	Total No. of Persons per day
1	Nil	0	0	0	0	0

4A.6.7: No of Persons Engaged Per Day

SI.No.	Number of Persons in Shift 1	Number of Persons in Shift 2	Number of Persons in Shift 3	Number of Persons in General Shift	Total No. of Persons per day
1	0	0	0	31	31

No of Shifts per Day ((A) = Machine Requirement Summary (B))	1
Average Daily Employment per Shift ((B) = (Total Number of Person per Day) / (A))	31
Material to be Handled per Shift ((C) = Machine Requirement Summary (E))	241

4A.6.8: Supervision

SI.No.	Particular	Qualification	Requirement / Proposed	In Position / Existing Strength	(Requirement / Proposed) - (In Position / Existing Strength) = (-) Shortage / (+) Excess	Remarks
1	Geologist	M.Sc Geology	1	1	0	Nil

4A.7: Waste Management**4A.7.1: Existing Dump**

SI.No.	Year	Dump Id	Type of Dump	Proposed Area (ha)	Height (m)	Latitude (dd:mm:ss.ss)		Longitude (dd:mm:ss.ss)		Total Dump Quantity (m ³)	Existing Dump Location
						From	To	From	To		

1	2023-2024	Existing & Proposed M.R, S.B Temporary dump	Waste	0.23	9.80	10:45:48.67	10:45:49.75	78:16:45.25	78:16:47.27	22954.00	NW
2	2024-2025	Existing & Proposed M.R, S.B Temporary dump	Waste	0.10	9.80	10:45:48.60	10:45:49.71	78:16:45.26	78:16:46.08	9800.00	NW

4A.7.2: New Dump

SI.No.	Year	Dump Id	Type of Dump	Proposed Area (ha)	Height (m)	Latitude (dd:mm:ss.ss)		Longitude (dd:mm:ss.ss)		Total Dump Quantity (m ³)	New Dump Location
						From	To	From	To		
1	2023-2024	Proposed T.S Temporary dump	Waste	0.10	6.50	10:45:46.28	10:45:46.83	78:16:50.73	78:16:51.59	5984.00	SE
2	2024-2025	Proposed T.S Temporary dump	Waste	0.10	10.70	10:45:46.28	10:45:46.83	78:16:50.73	78:16:51.59	9856.00	SE
3	2025-2026	Proposed T.S Temporary dump	Waste	0.10	15.00	10:45:46.28	10:45:46.83	78:16:50.73	78:16:51.59	13888.00	SE

4A.7.3: Existing Stack

SI.No.	Year	Stack ID	Type of Stack	Proposed Area (ha)	Height (m)	Latitude (dd:mm:ss.ss)		Longitude (dd:mm:ss.ss)		Total Stack Quantity (m ³)	Existing Stack Location
						From	To	From	To		
1	Nil	Nil	Nil	0.00	0.00	Nil	Nil	Nil	Nil	0.00	Nil

4A.7.4: New Stack

SI.No.	Year	Stack ID	Type of Stack	Proposed Area (ha)	Height (m)	Latitude (dd:mm:ss.ss)		Longitude (dd:mm:ss.ss)		Total Stack Quantity (m ³)	New Stack Location
						From	To	From	To		
1	Nil	Nil	Nil	0.00	0.00	Nil	Nil	Nil	Nil	0.00	Nil

4A.8: Mineral Waste Handling To Utilize As Minor Mineral

SI.No.	Year	Dump ID	Type of Dump	Proposed Area (ha)	Quantity Handled (t)	Quantity Recovered (t)	Name Of Minor Mineral	Alternative Waste Utilization (m ³)
1	Nil	Nil	Nil	0.00	0.00	0.00	Nil	0.00

4A.9: Use of Minerals

SI.No.	Proposed Use Of Mineral	Name Of Mineral	Relevant Use Of Mineral	Physical Specifications	Chemical Specifications
1	Direct Selling	LIMESTONE	The entire mined out mineral is being sold to the nearby cement and lime based industries which are located within a radius of 35-40Km from the mine site.	Creamy white in colour & Size 100 mesh	CaO: 40 to 48%; MgO: 0.15 to 1.5%

* Choose among these:

1. Captive use in own industry
2. Direct Selling
3. Selling Post-Beneficiation /Up-gradation

*Select more than one, if applicable

Chapter 4 B : Mining Operations UG : NA

Approved

Chapter 5: Sustainable Mining

5.1: Sustainable Mining and SDF Implementations in Compliance of Rule 35 of MCDR'2017

Measures will be taken to regulate the sustainable mining.

(Total 200 characters)

Compliance of Vishakha Committee Guidelines for prevention of women harassment at workplace	Not Applicable
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5.2: CSR INITIATIVES

5.2.1: 2023-2024

Details of Work Proposed during the Year / Measures Planned for the Affected Segment	Cumulative Work done / Measures Taken
5.2.1.1: Area to be Developed for Recreation	
Area (Ha)	Area (Ha)
0.00	0.00
5.2.1.2: Area for Water Storage & Recharge Facility	
Area (Ha)	Area (Ha)
0.00	0.00
5.2.1.3: Efforts Made towards Housing for Local Communities	
Number of Houses	Number of Houses
0	0

5.2.1.4: Efforts Made towards Providing Transport to Local Communities

Number of Beneficiaries	Number of Beneficiaries
0	0

5.2.1.5: Efforts Made towards Providing Healthcare to Local Communities

Number of Beneficiaries	Number of Beneficiaries
100	100

5.2.1.6: Efforts Made towards Providing Hygiene & Sanitation to Local Communities

Number of Beneficiaries	Number of Beneficiaries
150	150

5.2.1.7: Efforts Made towards Skill Development Programs to Local Communities

Number of Beneficiaries	Number of Beneficiaries
100	100

5.2.1.8: Efforts Made to Promote Education & Knowledge Based Initiatives

Number of Beneficiaries	Number of Beneficiaries
15	15

5.2.1.9: Communication Facilities Provided to Local Communities

Number of Beneficiaries	Number of Beneficiaries
0	0

5.2.1.10: Any Other Steps Taken for Improving the Socio-Economic Standard of Local Communities

Number of Beneficiaries	Number of Beneficiaries
0	0

5.2.1.11: Adoption of ODF

Number of Toilets Built inside the Lease Area	Number of Toilets Built outside the Lease Area:	Number of Beneficiaries
2	0	20

5.2.1.12: Awareness Program among Mine Workers for Swatchata

Number of Swatchata Programmes Proposed	Number of Swatchata Programmes Held
1	1

5.2.1.13: Efforts for green energy

Total energy consumption (KWh)	Green energy consumption (% of total)
0.00	0.00

5.2.1.14: Water & recycled use

Total water consumption (KLD)	Water recycled (% of total)
1.00	30.00

5.2.2: 2024-2025

Details of Work Proposed during the Year / Measures Planned for the Affected Segment	Cumulative Work done / Measures Taken
5.2.2.1: Area to be Developed for Recreation	
Area (Ha)	Area (Ha)
0.00	0.00

5.2.2.2: Area for Water Storage & Recharge Facility

Area (Ha)	Area (Ha)
0.00	0.00

5.2.2.3: Efforts Made towards Housing for Local Communities

Number of Houses	Number of Houses
0	0

5.2.2.4: Efforts Made towards Providing Transport to Local Communities

Number of Beneficiaries	Number of Beneficiaries
0	0

5.2.2.5: Efforts Made towards Providing Healthcare to Local Communities

Number of Beneficiaries	Number of Beneficiaries
120	220

5.2.2.6: Efforts Made towards Providing Hygiene & Sanitation to Local Communities

Number of Beneficiaries	Number of Beneficiaries
110	260

5.2.2.7: Efforts Made towards Skill Development Programs to Local Communities

Number of Beneficiaries	Number of Beneficiaries
100	200

5.2.2.8: Efforts Made to Promote Education & Knowledge Based Initiatives

Number of Beneficiaries	Number of Beneficiaries
10	25

5.2.2.9: Communication Facilities Provided to Local Communities

Number of Beneficiaries	Number of Beneficiaries
0	0

5.2.2.10: Any Other Steps Taken for Improving the Socio-Economic Standard of Local Communities

Number of Beneficiaries	Number of Beneficiaries
0	0

5.2.2.11: Adoption of ODF

Number of Toilets Built inside the Lease Area	Number of Toilets Built outside the Lease Area:	Number of Beneficiaries
0	0	40

5.2.2.12: Awareness Program among Mine Workers for Swatchata

Number of Swatchata Programmes Proposed	Number of Swatchata Programmes Held
1	2

5.2.2.13: Efforts for green energy	
Total energy consumption (KWh)	Green energy consumption (% of total)
0.00	0.00

5.2.2.14: Water & recycled use	
Total water consumption (KLD)	Water recycled (% of total)
1.00	30.00

5.2.3: 2025-2026

Details of Work Proposed during the Year / Measures Planned for the Affected Segment	Cumulative Work done / Measures Taken
5.2.3.1: Area to be Developed for Recreation	
Area (Ha)	Area (Ha)
0.00	0.00

5.2.3.2: Area for Water Storage & Recharge Facility	
Area (Ha)	Area (Ha)
0.00	0.00

5.2.3.3: Efforts Made towards Housing for Local Communities	
Number of Houses	Number of Houses
0	0

5.2.3.4: Efforts Made towards Providing Transport to Local Communities	
Number of Beneficiaries	Number of Beneficiaries
0	0

5.2.3.5: Efforts Made towards Providing Healthcare to Local Communities	
Number of Beneficiaries	Number of Beneficiaries
100	320

5.2.3.6: Efforts Made towards Providing Hygiene & Sanitation to Local Communities		
Number of Beneficiaries		Number of Beneficiaries
120		380
5.2.3.7: Efforts Made towards Skill Development Programs to Local Communities		
Number of Beneficiaries		Number of Beneficiaries
110		310
5.2.3.8: Efforts Made to Promote Education & Knowledge Based Initiatives		
Number of Beneficiaries		Number of Beneficiaries
10		35
5.2.3.9: Communication Facilities Provided to Local Communities		
Number of Beneficiaries		Number of Beneficiaries
0		0
5.2.3.10: Any Other Steps Taken for Improving the Socio-Economic Standard of Local Communities		
Number of Beneficiaries		Number of Beneficiaries
0		0
5.2.3.11: Adoption of ODF		
Number of Toilets Built inside the Lease Area	Number of Toilets Built outside the Lease Area:	Number of Beneficiaries
0	0	60
5.2.3.12: Awareness Program among Mine Workers for Swatchata		
Number of Swatchata Programmes Proposed		Number of Swatchata Programmes Held
1		3
5.2.3.13: Efforts for green energy		
Total energy consumption (KWh)		Green energy consumption (% of total)
0.00		0.00

5.2.3.14: Water & recycled use	
Total water consumption (KLD)	Water recycled (% of total)
1.00	30.00

5.2.4: 2026-2027

Details of Work Proposed during the Year / Measures Planned for the Affected Segment	Cumulative Work done / Measures Taken
5.2.4.1: Area to be Developed for Recreation	
Area (Ha)	Area (Ha)
0.00	0.00
5.2.4.2: Area for Water Storage & Recharge Facility	
Area (Ha)	Area (Ha)
0.00	0.00
5.2.4.3: Efforts Made towards Housing for Local Communities	
Number of Houses	Number of Houses
0	0
5.2.4.4: Efforts Made towards Providing Transport to Local Communities	
Number of Beneficiaries	Number of Beneficiaries
0	0
5.2.4.5: Efforts Made towards Providing Healthcare to Local Communities	
Number of Beneficiaries	Number of Beneficiaries
100	420
5.2.4.6: Efforts Made towards Providing Hygiene & Sanitation to Local Communities	
Number of Beneficiaries	Number of Beneficiaries
100	480

5.2.4.7: Efforts Made towards Skill Development Programs to Local Communities		
Number of Beneficiaries		Number of Beneficiaries
100		410
5.2.4.8: Efforts Made to Promote Education & Knowledge Based Initiatives		
Number of Beneficiaries		Number of Beneficiaries
10		45
5.2.4.9: Communication Facilities Provided to Local Communities		
Number of Beneficiaries		Number of Beneficiaries
0		0
5.2.4.10: Any Other Steps Taken for Improving the Socio-Economic Standard of Local Communities		
Number of Beneficiaries		Number of Beneficiaries
0		0
5.2.4.11: Adoption of ODF		
Number of Toilets Built inside the Lease Area	Number of Toilets Built outside the Lease Area:	Number of Beneficiaries
0	0	80
5.2.4.12: Awareness Program among Mine Workers for Swatchata		
Number of Swatchata Programmes Proposed		Number of Swatchata Programmes Held
1		4
5.2.4.13: Efforts for green energy		
Total energy consumption (KWh)		Green energy consumption (% of total)
0.00		0.00
5.2.4.14: Water & recycled use		
Total water consumption (KLD)		Water recycled (% of total)
1.00		30.00

5.2.5: 2027-2028

Details of Work Proposed during the Year / Measures Planned for the Affected Segment	Cumulative Work done / Measures Taken
5.2.5.1: Area to be Developed for Recreation	
Area (Ha)	Area (Ha)
0.00	0.00
5.2.5.2: Area for Water Storage & Recharge Facility	
Area (Ha)	Area (Ha)
0.00	0.00
5.2.5.3: Efforts Made towards Housing for Local Communities	
Number of Houses	Number of Houses
0	0
5.2.5.4: Efforts Made towards Providing Transport to Local Communities	
Number of Beneficiaries	Number of Beneficiaries
0	0
5.2.5.5: Efforts Made towards Providing Healthcare to Local Communities	
Number of Beneficiaries	Number of Beneficiaries
80	500
5.2.5.6: Efforts Made towards Providing Hygiene & Sanitation to Local Communities	
Number of Beneficiaries	Number of Beneficiaries
100	580
5.2.5.7: Efforts Made towards Skill Development Programs to Local Communities	
Number of Beneficiaries	Number of Beneficiaries
100	510

5.2.5.8: Efforts Made to Promote Education & Knowledge Based Initiatives

Number of Beneficiaries	Number of Beneficiaries
15	60

5.2.5.9: Communication Facilities Provided to Local Communities

Number of Beneficiaries	Number of Beneficiaries
0	0

5.2.5.10: Any Other Steps Taken for Improving the Socio-Economic Standard of Local Communities

Number of Beneficiaries	Number of Beneficiaries
0	0

5.2.5.11: Adoption of ODF

Number of Toilets Built inside the Lease Area	Number of Toilets Built outside the Lease Area:	Number of Beneficiaries
0	0	100

5.2.5.12: Awareness Program among Mine Workers for Swatchata

Number of Swatchata Programmes Proposed	Number of Swatchata Programmes Held
1	5

5.2.5.13: Efforts for green energy

Total energy consumption (KWh)	Green energy consumption (% of total)
0.00	0.00

5.2.5.14: Water & recycled use

Total water consumption (KLD)	Water recycled (% of total)
1.00	30.00

5.3: Rehabilitation & Resettlement of Affected Persons

Particular	2023-2024	2024-2025	2025-2026	2026-2027	2027-2028
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Proposed Number of Project Affected Persons(PAP)	0	0	0	0	0
Proposed Number of Person for Alternate Arrangement for Sustainable Livelihood	0	0	0	0	0
Proposed Number of Person for Skill Training	0	0	0	0	0
Proposed Number of Person Likely to get Direct Employment	0	0	0	0	0
Proposed Number of Person Likely to get Indirect Employment	0	0	0	0	0
Proposed Project Affected Families Skilled and Absorbed	0	0	0	0	0
Proposed Number of Project Affected Families	0	0	0	0	0

Chapter 6: Progressive Mine Closure Plan

6.1: Status of Land

Total Area Degraded				Total mined out area Reclaimed and Rehabilitated			Other Areas Reclaimed and Rehabilitated		
Total area under excavation in the lease		Area under Dumps(in hect)	Area under utility services(in hect)	Area under Stack yards(in hect)	Mined out Area Reclaimed but not rehabilitated(in hect)	Mined outArea fully Rehabilitated from Reclaimed area(in hect)	Area under Water Reservoir considered Rehabilitated (in hect)	Stabilized Waste dump Rehabilitated (in hect)	Virgin area under Green Belt (in hect)
Area under mining operation	Mined Out area in the lease								
1.24	0.00	0.32	0.07	0.00	0.00	0.00	0.00	0.08	

6.2: Progressive Reclamation and Rehabilitation Plan

6.2.1: Backfilling

Quantity of Waste / Fill Material Available at Site (m ³)	16080.00
Availability of Top Soil for Spreading (m ³)	5176.00
Proposed Spread Area (m ²)	3750.00

6.2.1.1: Year Wise Proposal

SI.No	Year	Pit ID	Area (m ²)	Top RL	Bottom RL	Estimated Expenditure (₹ INR)
1	2023-2024	1	510.00	174	168	143208.00
2	2024-2025	1	3240.00	174	156	1966770.00
3	2025-2026	1	3240.00	174	149	1050754.00

4	2026-2027	1	3240.00	174	149	448812.00
5	2027-2028	1	3240.00	174	149	320627.00

6.2.2: Water Reservoir

Average Rainfall of The Area (mm)	724.00
Proposed Area under Water Storage	0

6.2.2.1: Preparations For Ground Water Recharging

6.2.2.1.1: Drilling Holes	
Year	Proposed no of Holes to be Drilled
2023-2024	0.00
2024-2025	0.00
2025-2026	0.00
2026-2027	0.00
2027-2028	0.00

6.2.2.1.2:Preparation of Course Gravel Bed	
Year	Proposed Area of Bed (LxW)
2023-2024	0.00
2024-2025	0.00
2025-2026	0.00
2026-2027	0.00
2027-2028	0.00

Please specify, if others

Nil

6.2.2.2: Protective measures (Please specify running meter)

6.2.2.2.1: Fencing					
Year	Proposed Fencing Length (m)	Latitude(dd:mm:ss.ss)		Longitude(dd:mm:ss.ss)	
		From	To	From	To
2023-2024	124	10:45:50.03	10:45:47.35	78:16:46.15	78:16:45.12
2024-2025	150	10:45:47.35	10:45:45.91	78:16:45.12	78:16:48.53
2025-2026	136	10:45:45.91	10:45:47.19	78:16:48.53	78:16:51.91
2026-2027	97	10:45:47.19	10:45:50.32	78:16:51.91	78:16:52.27
2027-2028	193	10:45:50.32	10:45:49.94	78:16:52.27	78:16:47.04

6.2.2.2.2: Retaining Wall					
Year	Proposed Wall Length (m)	Latitude (dd:mm:ss.ss)		Longitude (dd:mm:ss.ss)	
		From	To	From	To
2023-2024	122	10:45:46.21	10:45:46.77	78:16:50.72	78:16:51.60
2024-2025	0	Nil	Nil	Nil	Nil
2025-2026	0	Nil	Nil	Nil	Nil
2026-2027	0	Nil	Nil	Nil	Nil
2027-2028	0	Nil	Nil	Nil	Nil

6.2.2.2.3: Garland Drains					
Year	Proposed Bund Length (m)	Latitude (dd:mm:ss.ss)		Longitude (dd:mm:ss.ss)	
		From	To	From	To
2023-2024	117	10:45:49.75	10:45:47.55	78:16:46.75	78:16:45.15
2024-2025	148	10:45:47.55	10:45:46.12	78:16:45.15	78:16:48.53
2025-2026	125	10:45:46.12	10:45:47.22	78:16:48.53	78:16:51.72
2026-2027	96	10:45:47.22	10:45:50.32	78:16:51.72	78:16:52.07

2027-2028	137	10:45:50.32	10:45:49.60	78:16:52.07	78:16:48.41
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6.2.3: Green Belt Development

6.2.3.1: Cumulative work done (upto end of previous block of five years)

SI.No	Total Expenditure Incurred up to Last Year (INR)	Area Covered (Ha)	Number of Plants	Survival Rate (%)
1	5000.00	0.08	50	40.00

6.2.3.2: Year Wise Proposal

SI.No	Year	Green Belt Location (s)	Area Proposed to be Covered (Ha)	Number of Plants Proposed	Expected Survival Rate (%)	Estimated Expenditure (₹ INR)
1	2023-2024	south	0.04	40	70	4000
2	2024-2025	south	0.04	40	70	4000
3	2025-2026	south	0.04	40	70	4000
4	2026-2027	south	0.04	40	70	4000
5	2027-2028	south east	0.04	40	70	4000

6.2.4: Use of Shallow Pits

6.2.4.1: Cumulative Work Done (upto end of previous block of five years)

SI.No	Pit ID	Work Done	Area covered (m ²)	Total Expenditure Incurred (up to last five year block) (₹ INR)
1	Nil	Nil	0.00	0.00

6.2.4.2: Year Wise Proposal

SI.No	Year	Pit ID	Total Area(Ha)	Area Proposed for Crops (Ha)	Suitable Crops	Area Proposed for Grass (Ha)	Total Proposed Expenditure (₹ INR)	Latitude (dd:mm:ss.ss)		Longitude (dd:mm:ss.ss)		Remarks
								From	To	From	To	
1	Nil	Nil	0.00	0.00	Nil	0.00	0.00	Nil	Nil	Nil	Nil	Nil

6.2.5: Pisciculture

6.2.5.1: Total Expenditure incurred as on Date (INR)	0
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6.2.5.2: Cumulative work done as on Date

SI.No	Pit ID	Area (m ²)	Expenditure (₹ INR)
1	Nil	0.00	0.00

6.2.5.3: Year Wise Proposal

SI.No	Year	Pit ID	Area (m ²)	Estimated Expenditure (₹ INR)
1	2023-2024	Nil	0.00	0.00
2	2024-2025	Nil	0.00	0.00
3	2025-2026	Nil	0.00	0.00
4	2026-2027	Nil	0.00	0.00
5	2027-2028	Nil	0.00	0.00

6.2.5.4: Source of Water for Pisciculture	Nil
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6.2.5.5: Whether the quality of water has been assessed & found to be suitable for Pisciculture	No
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6.2.6: Recreational Facility

6.2.6.1: Total Expenditure Incurred (up to last five year block) (INR)	0.00
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6.2.6.2: Cumulative work done as on Date

SI.No	Pit ID	Area (m ²)	Expenditure (₹ INR)
1	Nil	0.00	0.00

6.2.6.3: Year Wise Proposal

SI.No	Year	Type of Recreational Facility	Area Covered (Ha)	Latitude (dd:mm:ss.ss)		Longitude (dd:mm:ss.ss)		Estimated Expenditure (INR)
				From	To	From	To	
1	2023-2024	Nil	0.00	Nil	Nil	Nil	Nil	0.00
2	2024-2025	Nil	0.00	Nil	Nil	Nil	Nil	0.00
3	2025-2026	Nil	0.00	Nil	Nil	Nil	Nil	0.00
4	2026-2027	Nil	0.00	Nil	Nil	Nil	Nil	0.00
5	2027-2028	Nil	0.00	Nil	Nil	Nil	Nil	0.00

6.2.7: Dump Area Stabilization & Development

SI.No	Year	Dump ID	No of Terraces	Average Height of Terraces (m)	Length of Toe Wall (m)	Length of Garland Drain (m)	Area Stabilized (Ha)	Method of Stabilization	Estimated Expenditure (₹ INR)	No of Check Dams
1	Nil	Nil	0	0.00	0.00	0.00	0.00	Nil	0.00	Nil

6.2.8: Other Form of Reclaiming the Area**6.2.8.1: Cumulative work done as on Date**

SI.No	Total Expenditure incurred as on Date (INR)	Work Done
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1	0.00	Nil
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6.2.8.2: Year Wise Proposal

SI.No	Year	Work Proposals	Estimated Expenditure (INR)
1	2023-2024	Nil	0.00
2	2024-2025	Nil	0.00
3	2025-2026	Nil	0.00
4	2026-2027	Nil	0.00
5	2027-2028	Nil	0.00

6.2.9: TopSoil Management**6.2.9.1: Cummulative Work Done as on Date**

SI.No	Top Soil Generated (m ³)	Top Soil Utilized (m ³)	Topsoil Stored (m ³)	Total expenditure incurred as on date (₹)
1	10176.00	5000.00	5176.00	50000.00

6.2.9.2: Year Wise Proposal

SI.No	Year	Topsoil Generated (m ³) (A)	Topsoil Utilized (m ³) (B)	Topsoil Stored (m ³) (A-B)	Estimated Expenditure (INR)
1	2023-2024	0.00	0.00	0.00	0.00
2	2024-2025	0.00	0.00	0.00	0.00
3	2025-2026	0.00	0.00	0.00	0.00
4	2026-2027	0.00	0.00	0.00	0.00
5	2027-2028	0.00	0.00	0.00	0.00

6.2.10: Tailings Dam Management

SI.No	Year	Yearly generation of Tailing (m ³) (A)	Total capacity of Tailing Pond (m ³)	Measures Proposed for Periodic Desilting	Yearly Utilization of Tailing (m ³) (B)	Disposal of Tailing to Tailing Pond (m ³) (A-B)	Tailing Dam Design	Structural Stability Studies
1	2023-2024	0.00	0.00	Nil	0.00	0.00	Nil	Nil
2	2024-2025	0.00	0.00	Nil	0.00	0.00	Nil	Nil
3	2025-2026	0.00	0.00	Nil	0.00	0.00	Nil	Nil
4	2026-2027	0.00	0.00	Nil	0.00	0.00	Nil	Nil
5	2027-2028	0.00	0.00	Nil	0.00	0.00	Nil	Nil

6.2.11: Land Use of Lease Area at the Expiry of Lease Period

Total Area Degraded				Non Degraded area	Total mined out area Reclaimed and Rehabilitated			Other Areas Reclaimed and Rehabilitated			
Mined Out area in the lease	Area under Dumps(in hect)	Area under the Tailing Dam	Area under utility services(in hect)	Area undisturbed/virgin	Mined out Area Reclaimed but not rehabilitated(in hect)	Mined out Area fully Rehabilitated from Reclaimed area(in hect)	Area under Water Reservoir considered Rehabilitated (in hect)	Stabilized Waste dump Rehabilitated (in hect)	Virgin area under Green Belt (in hect)	Rehabilitated Area under utility services(in hect)	Rehabilitated Area under Tailing dam (in hect)
1.84	0.00	0.00	0.04	0.56	0.00	0.38	0.65	0.00	1.49	0.00	0.00

Chapter 7: Financial Assurance/ Performance Surety (AREA PUT TO USE)

2023-2024

Consolidated View of Financial Assurance

SI.No	Particular	Area put to use at Start of Year (ha) (A)	Additional Requirement (ha) (B)	Total (ha) (C = A + B)
1	Area under Mining	1.24	0.12	1.36
2	Topsoil stacking	0.00	0.00	0.00
3	Overburden/Waste Dumping	0.32	0.00	0.32
4	Mineral Storage	0.03	-0.03	0.00
5	Infrastructure (Workshop, Administrative Building etc.)	0.01	0.00	0.01
6	Roads	0.03	0.00	0.03
7	Railway	0.00	0.00	0.00
8	Tailing Pond	0.00	0.00	0.00
9	Effluent Treatment Plant	0.00	0.00	0.00
10	Mineral Separation Plant	0.00	0.00	0.00
11	Township Area	0.00	0.00	0.00
12	Others to specify	0.08	0.04	0.12
	Total	1.71	0.13	1.84

2024-2025

Consolidated View of Financial Assurance

SI.No	Particular	Area put to use at Start of Year (ha) (A)	Additional Requirement (ha) (B)	Total (ha) (C = A + B)
1	Area under Mining	1.36	0.12	1.48
2	Topsoil stacking	0.00	0.00	0.00
3	Overburden/Waste Dumping	0.32	-0.13	0.19
4	Mineral Storage	0.00	0.00	0.00
5	Infrastructure (Workshop, Administrative Building etc.)	0.01	0.00	0.01
6	Roads	0.03	0.00	0.03
7	Railway	0.00	0.00	0.00
8	Tailing Pond	0.00	0.00	0.00
9	Effluent Treatment Plant	0.00	0.00	0.00
10	Mineral Separation Plant	0.00	0.00	0.00
11	Township Area	0.00	0.00	0.00
12	Others to specify	0.12	0.04	0.16
	Total	1.84	0.03	1.87

2025-2026

Consolidated View of Financial Assurance

SI.No	Particular	Area put to use at Start of Year (ha) (A)	Additional Requirement (ha) (B)	Total (ha) (C = A + B)
1	Area under Mining	1.48	0.12	1.60
2	Topsoil stacking	0.00	0.00	0.00
3	Overburden/Waste Dumping	0.19	-0.09	0.10
4	Mineral Storage	0.00	0.00	0.00
5	Infrastructure (Workshop, Administrative Building etc.)	0.01	0.00	0.01

6	Roads	0.03	0.00	0.03
7	Railway	0.00	0.00	0.00
8	Tailing Pond	0.00	0.00	0.00
9	Effluent Treatment Plant	0.00	0.00	0.00
10	Mineral Separation Plant	0.00	0.00	0.00
11	Township Area	0.00	0.00	0.00
12	Others to specify	0.16	0.04	0.20
	Total	1.87	0.07	1.94

2026-2027

Consolidated View of Financial Assurance

SI.No	Particular	Area put to use at Start of Year (ha) (A)	Additional Requirement (ha) (B)	Total (ha) (C = A + B)
1	Area under Mining	1.60	0.12	1.72
2	Topsoil stacking	0.00	0.00	0.00
3	Overburden/Waste Dumping	0.10	0.00	0.10
4	Mineral Storage	0.00	0.00	0.00
5	Infrastructure (Workshop, Administrative Building etc.)	0.01	0.00	0.01
6	Roads	0.03	0.00	0.03
7	Railway	0.00	0.00	0.00
8	Tailing Pond	0.00	0.00	0.00
9	Effluent Treatment Plant	0.00	0.00	0.00
10	Mineral Separation Plant	0.00	0.00	0.00
11	Township Area	0.00	0.00	0.00
12	Others to specify	0.20	0.04	0.24
	Total	1.94	0.16	2.10

2027-2028

Consolidated View of Financial Assurance

Sl.No	Particular	Area put to use at Start of Year (ha) (A)	Additional Requirement (ha) (B)	Total (ha) (C = A + B)
1	Area under Mining	1.72	0.12	1.84
2	Topsoil stacking	0.00	0.00	0.00
3	Overburden/Waste Dumping	0.10	0.00	0.10
4	Mineral Storage	0.00	0.00	0.00
5	Infrastructure (Workshop, Administrative Building etc.)	0.01	0.00	0.01
6	Roads	0.03	0.00	0.03
7	Railway	0.00	0.00	0.00
8	Tailing Pond	0.00	0.00	0.00
9	Effluent Treatment Plant	0.00	0.00	0.00
10	Mineral Separation Plant	0.00	0.00	0.00
11	Township Area	0.00	0.00	0.00
12	Others to specify	0.24	0.04	0.28
	Total	2.10	0.16	2.26
	Grand Total			2.26

Financial Assurance

Financial Assurance**Category A Mining Lease**

Total Area Proposed to be put to use in	Amount of Bank Gurantee (Lac INR)	Valid till (dd/mm/yyyy)	Upload copy of Bank Gurantee as attachment
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hect(Year 1 to 5)			
2.26	11.30	31/03/2028	10_BG.pdf

Category B Mining Lease

SI.No	Total Area Proposed to be put to use in hect(Year 1 to 5)	Amount of Bank Gurantee (Lac INR)	Valid till (dd/mm/yyyy)	Upload copy of Bank Gurantee as attachment
1	Nil	Nil	Nil	Nil

Approved

Chapter 8: Review of Previous Proposals (Not applicable for fresh grant)

8.1: General

8.1.1: Lease Area Utilization

Sl. No.	Type of land use (in ha)	Area at the beginning of the proposal period	Area proposed under activity	Actual Area utilized in the proposal period	Deviation	Reasons for deviation
1	Mining	1.24	1.24	1.24	0	Nil
2	Mineral storage	0.03	0.03	0.03	0	Nil
3	Mineral Beneficiation plant	0.00	0.00	0.00	0	Nil
4	Township	0.00	0.00	0.00	0	Nil
5	Tailing Pond	0.00	0.00	0.00	0	Nil
6	Railways	0.00	0.00	0.00	0	Nil
7	Roads	0.03	0.03	0.03	0	Nil
8	Infrastructure (Workshop, administrative building etc.)	0.01	0.01	0.01	0	Nil
9	OB/waste dump	0.32	0.32	0.32	0	Nil
10	Top soil preservation	0.00	0.00	0.00	0	Nil
11	Others	0.08	0.28	0.16	-0.12	Mine was stopped on 16.12.2016 for not obtaining environmental clearance from competence authority. EC is under process. Please refer Annexure No 5.

12	Total area put to use	1.71	1.91	1.79	-0.12	Nil
13	Excavated area reclaimed	0.00	0.00	0.00	0	Nil
14	Waste dump area reclaimed	0.00	0.00	0.00	0	Nil
15	Undisturbed Area	0.81	0.61	0.73	0.12	Nil
	Total	2.52	2.52	2.52	0	

8.1.2: SDF and CSR Expenditures

Activity	Proposals		Achievement	Deviation	Reasons for deviation
Total expenditure incurred for implementation of SDF at mine level including - Environment Protection - CSR & other welfare activities in peripheral area (Explanation: Expenditure is not over and above the statutory levies imposed by the Government; However, THIS EXCLUDES CONTRIBUTION TO DMF & NMET and is over and above the statutory levies imposed by the Government.)	10% of Royalty (a)	Total Expenditure for SDF implementation (b)			
CSR (Corporate Social Responsibility) spending at the mine level in Proposal Period (as per Companies Act, 2013 or otherwise)	1471700.00	500000.00	1500000.00	1000000.00	Mine was stopped on 16.12.2016 for not obtaining environmental clearance from competence authority. EC is under process.

8.2: Technical Details

8.2.1: Exploration

Particulars	Proposals			Achievement			Deviation			Reasons for deviation
	Boreholes	Pits	Trenchs	Boreholes	Pits	Trenchs	Boreholes	Pits	Trenchs	
Number of Boreholes/ Pits/ Trenches	0	0	0	Nil	Nil	Nil	Nil	Nil	Nil	Nil
Boreholes Meterage (If Boreholes selected in first row) (m)	0			0			0			Nil
Grid	0			0			0			Nil
G Axis upgradation during Proposal Period as per guidelines of MEMC Rule 2015)	0			0			0			Nil
Area converted under G1 from G2/G3	0			0			0			Nil

8.2.2: Mine Development (Opencast/ Underground/ Both/ Dump Mining)

Particulars	Proposals	Actual	Deviation	Reasons for deviation
8.2.2.1: Generation of Ore/Waste While Development				
Ore	306602	0	-306602	Mine was stopped on 16.12.2016 for not obtaining environmental clearance from competence authority. EC is under process. Please refer Annexure No 14.
Waste	202118	0	-202118	Nil

Generated Waste while ROM recovery	122641	0	-122641	Nil
Dumping Site (For Surface)	0	0	0	Nil
Removal of waste/ over burden in cubic meters	77738	0	-77738	Nil
8.2.2.2: Excavation				
Lateral extent	0	0	0	Proposal - 10:45:47.50N 10:45:49.81N 78:16:45.37E 78:16:51.94E, Achievement - Nil, Deviation - 10:45:47.50N 10:45:49.81N 78:16:45.37E 78:16:51.94E
Vertical extent	33	0	-33	Mine was stopped on 16.12.2016 for not obtaining environmental clearance from competence authority. EC is under process. Please refer Annexure No 14.

8.2.3: Mining operation: Dump Mining

Particulars	Proposals	Achievement	Deviation	Reasons for deviation
Handling of Material	0	0	0	Nil
Waste Generated post recovery	0	0	0	Nil
Dumping site for waste	0	0	0	Nil

8.2.4: Zero Waste Mining

Particulars	Proposals	Achievement	Deviation	Reasons for deviation
Alternative use / Disposal of Waste Generated (excluding top soil)	0.00	0.00	0.00	Nil

8.2.5: Backfilling

Particulars	Proposals	Achievement	Deviation	Reasons for deviation
Site (Co-ordinates)	10:45:48.92 N 10:45:49.93 N 78:16:50.28 E 78:16:51.91E	0	10:45:48.92 N 10:45:49.93 N 78:16:50.28 E 78:16:51.91E	Mine was stopped on 16.12.2016 for not obtaining environmental clearance from competence authority. EC is under process. Please refer Annexure No 14.
Area	2750	0	-2750	Nil
Depth	33	0	-33	Nil
Volume Backfilled (CuM)	27744	0	-27744	Nil
Backfilled Area available for Reclamation and Rehabilitation	0	0	0	Nil
Backfilled Area Reclaimed and Rehabilitated	0	0	0	Nil
Balance Backfilled Area	0	0	0	Nil

8.2.6: Production of Mineral(s)

Particulars	Proposals	Achievement	Deviation	Reasons for deviation
8.2.6.1: ROM				
Opencast	306602.0000	0.0000	-306602.0000	Mine was stopped on 16.12.2016 for not obtaining environmental clearance from competence authority. EC is under process. Please refer Annexure No 14.
8.2.6.2: Cleaned Ore				
Opencast	183961.0000	0.0000	-183961.0000	Mine was stopped on 16.12.2016 for not obtaining environmental clearance from competence authority. EC is under process. Please refer Annexure No 14.
Dump Mining	0.0000	0.0000	0.0000	Nil
Recovery from Mineral Rejects or	0.0000	0.0000	0.0000	Nil

Tailings				
Total	183961.0000	0.0000	-183961.0000	Nil

8.2.7: Handling of Mineral Rejects/ Sub-Grade

Particulars	Proposals	Achievement	Deviation	Reasons for deviation
Generation of mineral rejects				
Opencast	122641	0	-122641	Mine was stopped on 16.12.2016 for not obtaining environmental clearance from competence authority. EC is under process. Please refer Annexure No 14.
Dump Mining	0	0	0	Nil
Other recovery	0	0	0	Nil
Stacking of mineral rejects/ sub-grade mineral (Dump Id)	0	0	0	Nil
Blending of mineral reject / sub-grade	0	0	0	Nil

8.2.8: Environment Compliances

Particulars	Proposals	Achievement	Deviation	Reasons for deviation
8.2.8.1: Top soil				
Generation	19960	0	-19960	Mine was stopped on 16.12.2016 for not obtaining environmental clearance from competence authority. EC is under process. Please refer Annexure No 14.
Utilization	0	0	0	Nil
Stacking (Dump Id)	0	0	0	Nil

Reclamation	0	0	0	Nil
Rehabilitation	0	0	0	Nil
8.2.8.2: Afforestation (Dumps/Benches/Backfilled Area etc.)				
2018 - 2019	0	0	0	Nil
2019 - 2020	0	0	0	Nil
2020 - 2021	0	0	0	Nil
2021 - 2022	0	0	0	Nil
2022 - 2023	0	0	0	Nil
8.2.8.3: Afforestation (Green Belt)				
2018 - 2019	20	10	-10	Mine was stopped on 16.12.2016 for not obtaining environmental clearance from competence authority. EC is under process. Please refer Annexure No 14.
2019 - 2020	20	10	-10	Nil
2020 - 2021	20	10	-10	Nil
2021 - 2022	20	10	-10	Nil
2022 - 2023	20	10	-10	Nil
Construction of check dams	0	0	0	Nil
Construction of Garland Drain (in meter)	0	0	0	Nil
Construction of Retaining Walls (in meter)	0	0	0	Nil
8.2.8.4: Tailings				
Generation	0	0	0	Nil
Utilization	0	0	0	Nil
Disposal	0	0	0	Nil

8.3: Socio-Economic Review**8.3.1: Rehabilitation & Resettlement for Project Affected People**

Particulars	Proposals	Achievement	Deviation	Reasons for deviation
No. of Project Affected People (PAP)	0.0000	0.0000	0.0000	Nil
%age of PAP for whom alternate arrangements made for sustained livelihood	0.0000	0.0000	0.0000	Nil
% of project affected families given employment	0.0000	0.0000	0.0000	Nil
% of project affected families who have been skilled by the lessee and absorbed (% of total employment given to affected families)	0.0000	0.0000	0.0000	Nil

8.3.2 : Grievance Redressal

Grievances Received	2018 - 2019	2019 - 2020	2020 - 2021	2021 - 2022	2022 - 2023
	0	0	0	0	0
Grievances Redressed	0	0	0	0	0

8.3.3: Welfare and socio-economic development programs for local communities

Particulars	2018 - 2019	2019 - 2020	2020 - 2021	2021 - 2022	2022 - 2023
8.3.3.1 Support for Drinking Water & Agriculture					
No. of Water Storage Tanks constructed	0	0	0	0	0
Drinking Water Facilities	0	0	0	0	0

provided (Bore wells/ Pumps etc.)					
Irrigation Support provided (Canals/ Pumps etc.)	0	0	0	0	0
No. of Water tanks De-silted	0	0	0	0	0
Water Treatment facilities provided (A/NA)	0	0	0	0	0
Amount of Water treated (in kL) (if selected A in above)	0	0	0	0	0
8.3.3.2 Support to Health & Medical Services					
No. of persons identified from Occupational health diseases	0	0	0	0	0
No. of Health Camps/ Medicine Camps Organized	0	0	0	0	0
8.3.3.3 Support to Skill development & Education					
Vocational Training Provided/ Support Provided					
No. of employees undergone Vocational training	0	0	0	15	15
No. of other persons undergone Vocational training	0	0	0	15	15
Number of Literacy & Education Camps held/ Supported	0	0	0	1	1
8.3.3.4 Support to Transportation Services & Infrastructure					
Expenditure on Transportation Services & Infrastructure	0	0	0	0	0
Road development (m) in the peripheral area (not lease area)	0	0	0	0	0
No. of Public transport support provided (Ambulance/Buses/ School Vans etc)	0	0	0	0	0

8.3.3.5 Swatchata Programs: Creating/providing sanitation and healthy condition in and around the mine area

Adoption of ODF within mining lease area					
No. of Toilets built in the Lease Area	0	0	0	0	0
Adoption of ODF in nearby villages					
No. Of Toilets built in the villages	0	0	0	0	0
Provision for greenage recreational facility (Within Lease Area/ Outside)					
Recreational Area Type (Picnic Spot/ tracks/Park Etc)	0	0	0	0	0
Area covered (For within Lease Area only)	0	0	0	0	0
Awareness program among Mine workers for Swatchata					
No. of Swatchcha Programmes held	0	0	1	1	1

Chapter 9 : Impact Assessment (NA)

Approved

Chapter 10: Annexures

1. Upload Document

1.1 Upload Document

Sl.No.	Title	Is Upload	Document (only pdf allowed)
1	Letter of Intent /Letter of lease grant	Nil	1_GO_63.pdf
2	Copy of lease deed executed	Nil	2_Lease_Deed1.pdf
3	Copy of Declaration of Owner/Nominated Owner in case of Company/partnership firm	Nil	3_Authorisation.pdf
4	ID & Address Proof of Owner/ Nominated Owner	Nil	4_ID_proof_of_lessee1.pdf
5	Copy of Environment and Forest Clearence, Consent to Establish, Consent to Operate	Nil	5_EC_Status.pdf
6	Copy of Registration of Company (RoC)/Partnership firm (Registration) & Deed	Nil	6_ROC_&Partnership_Deed1.pdf
7	Consent letter for Qualified Person	Nil	7_Consent_Certificate_for_QP.pdf
8	Experience & Qualification Details of Qualified Person	Nil	8_Qualification_Experience_Detail_ID_proof_of_QP1.pdf
9	Certificate from QP	Nil	9_QP_Certificate.pdf
10	Copy of Bank Guarantee	Nil	10_BG_10A_fine_rpt.pdf
11	Copy of Performance Surety	Nil	Nil
12	Copy of MDPA (as applicable)	Nil	Nil
13	Exploration details	Nil	13_Exploration_Details.pdf
14	Copy of feasibility Report	Nil	11_Feasibility_Report_finall1.pdf
15	Copy of Study reports conducted as per Para	Nil	16B_Bulk_density_study_report.pdf

	4.3.1		
16	Chemical and Mineralogical analysis report	Nil	<u>16 16A Chemical Analysis Report.pdf</u>
17	Any other Report or Certification as required in the submitted Document.	Nil	<u>17 18 19 20 21 22 23.pdf</u>
18	Copy of Scale relaxation approval granted(if applicable)	Nil	Nil
19	Mineral processing flowsheet with stage wise recovery	Nil	Nil
20	Any Other	Yes	<u>24 TO 29_new_redu.pdf</u>

Approved

Chapter 11: Plates (OC)

1. Upload Document

1.1 Upload Document

S.N.	Title	Is Upload	Document
1	Lease sketch plan;	Nil	1_CADAS_PL.pdf
2	Surface Plan (.KMZ format)(Georeferenced); A statutory plan as per MCDR, 2017. The Plan should be submitted showing different color codes for:(1) Active Pits & Excavation area(2) Excavated area reclaimed & rehabilitated (3)Active dumps (4) Stabilized & rehabilitated dump area , (5) Green belt (6) Mineral Stacks (7) Utilities such as plant, buildings etc (8) Lease boundary along with other details.)	Nil	2_Surface_plan.KMZ
3	Surface Geological Plan of the lease (.KMZ format)(Georeferenced); The Plan should be submitted showing different color codes for : (1) Lithological/Geological Occurance (2) Area under G1,G2,G3 & G4 (3) Active pits & Excavation area (4) Dump Area (5) Mineral Stacks (6) Lease boundary along with other details.)	Nil	3_Geological_plan.KMZ
4	Surface Geological sections (in Pdf format); Geological sections with different color coding depicting all the features shown in Surface Geological Plan.)	Nil	2 SUR PL 3 GEO PL 4 GEO SEC.pdf
5	Five year Production and Development plan (.KMZ format)(Georeferenced); The Plan should be submitted showing different color coding for: (1) Active Pit and Excavation area ,	Nil	5_All_Yearwise_plan.kmz

	(2) Year wise excavation proposal for year I to V (3) Active dump and yearwise dump proposal for year I to V (4) Year wise Dump working proposal for year I to V (6) Lease boundary (with reference to chapter 4) along with other details.)		
6	Five year Production and Development sections (in pdf format); Year wise excavation and dumping proposals with different color coding depicting all the features as shown in the Five year Production and development plan.)	Nil	5A TO 5E YR PL 6 YR SEC.pdf
7	Progressive Mine Closure Plan (.KMZ format)(Georeferenced); The Plan should be submitted showing different color coding for : (1) Yearwise excavated area Reclaimed & rehabilitated for year I to V (2) Year wise dump area to be stabilized and dump area to be rehabilitatd for year I to V (3) Year wise Green area proposed from year I to V.(4) Any other reclamation and rehabilitation measures proposed.(5) Lease boundary (with reference to chapter 6) along with other details.)	Nil	7 Progressive plan.KMZ
8	Progressive mine Closure sections (in pdf format); Year wise Progressive mine clouser sections showing all the yearwise reclamation, rehabilitaion proposals as depicted in the Progressive mine clouser plan.)	Nil	7 PROG PL 8 PROG SEC.pdf
9	Conceptual Plan (.KMZ format)(Georeferenced); The Plan should depict the staus of lease area as envisaged at the end of life of Mine showing all the details. Status of land use shall be depicted by different color coding.)	Nil	9 Conceptual plan.KMZ
10	Conceptual Sections (pdf) format;	Nil	9 CONC PL 9A CONC SEC.pdf
11	Geo referenced Cadastral Plan; Duly certified by the State Government)	Nil	Ragavendra-Geo Reference.pdf
12	Financial Assurance Plan (KMZ);	Nil	11 Financial Assurance plan.KMZ

13	Environmental Plan (.KMZ format)(Georeferenced); As per MCDR, 2017 indicating all the details.)	Nil	<u>10 Environmental plan.KMZ</u>
14	Any other plan/section as deemed necessary by approving authority;	Yes	<u>1A_ROU_1B_LOCA_1C_KEY_PLAN.pdf</u>
15	Five Year Production and Development sections (in pdf format);	Yes	<u>10_ENVI_11_FINAN_PL.pdf</u>
16	LEVEL WISE SLICE PLAN; LEVEL WISE SLICE PLAN (PDF FORMAT IN VISIBLE SCALE))	Nil	Nil

Approved

Chapter 11 : Plates(UG) : NA

Approved

Esigned by: RO
Date: 25/08/2023 05:19:14 PM

பெருவகை கனிமங்களை சுரங்ககளிலிருந்து எடுத்துச் செல்வதற்கான இசைவானைச்சீட்டு

பெருவகை கனிமங்கள் மற்றும் தாதுக்களை சுரங்கங்களிலிருந்து தொழில் கூடங்களுக்கோ அல்லது உற்பத்திக்கோ எடுத்துச் செல்வதற்காக வழங்கப்படுகிறது.

1957-ஆம் ஆண்டு சுரங்கங்கள் மற்றும் குழுங்குமுறை மற்றும் வளர்ச்சி சட்டம், பிரிவுகள் 4, 21, 23 மற்றும் 24 முதலியவற்றுடன் 1960-ஆம் ஆண்டு கனிமச் சலுகை விதிகளில் உள்ள விதி எண்கள் 14இ, 27(1) மற்றும் 27(2) (ஏ), 44, 45, 52 மற்றும் 53 தொடர்பாக சுரங்கங்கள் மற்றும் கனிம வளர்ச்சியை மேம்படுத்துவதற்கு ஏதுவாக வழங்கப்பட்டது.

01.12.16

45 71 71 50
45 71 72 49

100

Ragavendra Minerals & Chemicals
 எண். எம். 018 5869
 Old No. 11, New No. 364,
 Uthiracalicutanman Kovil Street
 Anna Nagar, Chennai, Trichy-17
 930 No. 83 IND (minerals) Dept,
 Dn. 19.05.1998
 20 years 12.11.1998 to 11.11.2018

1. சுரங்கத் துறைகாரர் / திருவனத்தின் பெயர் மற்றும் முகவரி
2. துறை / அனுமதி வழங்கப்பட்ட அரசு ஆணை எண்
3. துறை / அனுமதி செல்லுபடியாகும் காலம் (தேதியுடன்)
4. சுரங்கம் அமைந்துள்ள இடம் பற்றிய தகவல்கள்

மாவட்டம்	வட்டம்	கிராமம்	புரணன்
Karur	Kadavur	Thonitai	808/2 etc.

1. (அ) சுரங்கத்திலிருந்து எடுத்துச் செல்ல அனுமதி கோரும் கனிமத்தின் பெயரும், அளவும் (டன்களில்)

Limestone

15 MT X 100 = 1500 MT

2. (ஆ) சுரங்கத்திலிருந்து எடுத்துச் செல்லும் கனிமத்திற்கு செலுத்த வேண்டிய உரிம வரி மற்றும் பிற வரிகள் செலுத்திய தகவல்கள் (அளவு, செலுத்திய தொகை மற்றும் செலுத்திய நாள் முதலியவற்றுடன்)

Already Balance
 Bullion 55.50 /
 14-11-2016 } Rs. 160000
 1500 MT X 80 royalty Rs. 120000
 Balance as on Rs. 40000

3. கனிமத்தை சுரங்கத்திலிருந்து எடுத்துச் செல்லும் முறை பாராட்டுபடுகிறது / வண்டி அல்லது இரயில் மூலமாக பாராட்டுபடுகிறது மூலம் எடுத்துச் செல்வதற்கான அதன் பதிவு எண் மற்றும் வழித்தட விபரம்

By Lorry
 TNPL - Kariyapuram
 Salem, Chennai, Dindigul
 (via) Karur, Namakkal,
 Perambalur, Palayam
 DNO: 2851 to 2950
 Valid upto: 16.12.16

4. கனிமம் எடுத்துச் செல்லப்படும் முகவரியும்

VALID UPTO 16 DEC 2016

5. கனிமத்தை சுரங்கத்திலிருந்து எடுத்துச் செல்லும் நாள் மற்றும் நேரம்

6. இசைவானைச்சீட்டு செல்லுபடியாகும் காலம்

7. வெட்டி எடுக்கப்பட்ட கனிமத்தை சுரங்கத்திலிருந்து எடுத்துச் செல்வதற்கு முன் சுரங்க அபிவி மேற்கொண்ட அலுவலரின் பெயர் மற்றும் பதவிகள் விவரங்கள், பார்வையிட்ட தேதி மற்றும் அவரால் எடுத்துச் செல்வதற்கு இசைவானைச்சீட்டை வழங்கிய கனிமத்தின் அளவு முதலியன.

ASSISTANT DIRECTOR GEOLOGY AND MINING KARUR

இசைவானைச்சீட்டு வழங்கும் அதிகாரம் பெற்ற அலுவலரின் கையொப்பம், பெயர் பதிவிடப்படுகின்றன





KGS ENVIRO LABORATORY PVT LTD

NABL Accredited Testing Laboratory (ISO/IEC 17025:2017)



TEST REPORT

Test Report No.: KGS/0222/TR/W-145

Client Name & Address		M/S.RAGAVENDRA MINERALS AND CHEMICALS, Mr. E. Dhanapal (Managing Partner), No.D/364,1st Cross, Ukkirakaliamman Koil Street, Anna Nagar, Thennur, Trichy, Tamilnadu - 620017	
Site Location		S.F.No's 809/2, 809/3, 809/4, 809/5 (P) Extent 2.51.5 ha, Thennilai Village, Kadavur Taluk, Karur District, Tamilnadu.	
Sample Description	BW-1	Sample Reference	KGS/0222/W-145
Sample Mark	Manjapallipatti	Sample Drawn by	Chemist
Sample Quantity	2.0ltr	Sample Collected on	23.02.2022
Sample Received on	24.02.2022	Test Commenced on	24.02.2022
Test Completed on	28.02.2022	Test Reported on	28.02.2022

S.No.	Parameters	Units	Test Methods	Result
1	Color	Hazen	IS 3025 Part 4 :1983	< 5
2	Odour	-	IS 3025 Part 5 :1983	Agreeable
3	pH@ 25°C	-	IS 3025 Part 11 :1983	8.02
4	Electrical Conductivity @ 25°C	µs/cm	IS 3025 Part 14 :1984	765
5	Turbidity	NTU	IS 3025 Part 10 :1984	< 1
6	Total Dissolved Solids	mg/l	IS 3025 Part 17 :1984	451
7	Total Hardness as CaCO ₃	mg/l	IS 3025 Part 21: 2009	131.7
8	Calcium as Ca	mg/l	IS 3025 Part 40 :1991	27.6
9	Magnesium as Mg	mg/l	IS 3025 Part 46 :1994	15.3
10	Total Alkalinity as CaCO ₃	mg/l	IS 3025 Part 23 :1984	140
11	Chloride as Cl ⁻	mg/l	IS 3025 Part 32 :1988	188.4
12	Sulphate as SO ₄ ²⁻	mg/l	IS 3025 Part 24:1986	18.1
13	Iron as Fe	mg/l	IS 3025 Part 53 :2003	BDL(DL:0.1)
14	Free Residual Chlorine	mg/l	IS 3025 Part 26: 1986	BDL (DL: 2.0)
15	Fluoride as F	mg/l	IS 3025 Part 60: 2008	0.12
16	Nitrates as NO ₃	mg/l	IS 3025 Part 34: 1988	8.3

.....Continue Report.....



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KGS ENVIRO LABORATORY PVT LTD

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TEST REPORT

Test Report No.: KGS/0222/TR/W-145

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Site Location		S.F.No's 809/2, 809/3, 809/4, 809/5 (P) Extent 2.51.5 ha, Thennilai Village, Kadavur Taluk, Karur District, Tamilnadu.	
Sample Description	BW-1	Sample Reference	KGS/0222/W-145
Sample Mark	Manjapallipatti	Sample Drawn by	Chemist
Sample Quantity	2.0ltr	Sample Collected on	23.02.2022
Sample Received on	24.02.2022	Test Commenced on	24.02.2022
Test Completed on	28.02.2022	Test Reported on	28.02.2022

S. No.	Parameters	Units	Test Methods	Result
17	Copper as Cu	mg/l	IS 3025 Part 2 : 2004	BDL (DL:0.2)
18	Manganese as Mn	mg/l	IS 3025 Part 2 : 2004	BDL (DL:0.05)
19	Mercury as Hg	mg/l	IS 3025 Part 2 : 2004	(BDL (DL: 0.0005)
20	Cadmium as Cd	mg/l	IS 3025 Part 2 : 2004	BDL (DL:0.01)
21	Selenium as Se	mg/l	IS 3025 Part 2 : 2004	BDL (DL: 0.05)
22	Aluminium as Al	mg/l	IS 3025 Part 2 : 2004	BDL (DL: 0.03)
23	Lead as Pb	mg/l	IS 3025 Part 2 : 2004	BDL (DL:0.01)
24	Zinc as Zn	mg/l	IS 3025 Part 2 : 2004	BDL (DL:0.02)
25	Total Chromium	mg/l	IS 3025 Part 2 : 2004	BDL (DL: 0.05)
26	Boron as B	mg/l	IS 3025 Part 2 : 2004	BDL (DL:0.1)
27	Mineral Oil	mg/l	IS 3025 Part 39 : 1991	BDL (DL:1.0)
28	Phenolic Compounds as C ₆ H ₅ OH	mg/l	IS 3025 Part 43 : 1992	Absent
29	Anionic Detergents as MBAS	mg/l	IS 13428: 2005 (Annex K)	BDL (DL:0.1)
30	Cyanide as CN	mg/l	IS 3025 Part 27 : 1986	Absent
31	Total Coliform	Per 100ml	IS 1622 : 1981	< 2
32	E-Coli	Per 100ml	IS 1622 : 1981	< 2

.....Continue Report.....



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KGS ENVIRO LABORATORY PVT LTD

NABL Accredited Testing Laboratory (ISO/IEC 17025:2017)



TEST REPORT

Test Report No.: KGS/0222/TR/W-145			
Client Name & Address		M/S.RAGAVENDRA MINERALS AND CHEMICALS, Mr. E. Dhanapal (Managing Partner), No.D/364,1st Cross, Ukkirakaliamman Koil Street, Anna Nagar, Thennur, Trichy, Tamilnadu - 620017	
Site Location		S.F.No's 809/2, 809/3, 809/4, 809/5 (P) Extent 2.51.5 ha, Thennilai Village, Kadavur Taluk, Karur District, Tamilnadu.	
Sample Description	BW-1	Sample Reference	KGS/0222/W-145
Sample Mark	Manjapallipatti	Sample Drawn by	Chemist
Sample Quantity	2.0ltr	Sample Collected on	23.02.2022
Sample Received on	24.02.2022	Test Commenced on	24.02.2022
Test Completed on	28.02.2022	Test Reported on	28.02.2022

S. No.	Parameters	Units	Test Methods	Result
33	Barium as Ba	mg/l	IS 13428	BDL (DL:0.5)
34	Ammonia (as Total Ammonia-N)	mg/l	IS 3025 Part 34	BDL (DL:0.1)
35	Sulphide as H ₂ S	mg/l	IS 3025 Part 29	BDL (DL:0.05)
36	Molybdenum as Mo	mg/l	IS 3025 Part 2	BDL (DL:0.5)
37	Total Arsenic as As	mg/l	IS 3025 Part 37	BDL (DL:0.01)
38	Total Suspended Solids	mg/l	IS 3025 PART17	BDL(DL:2)

.....End of Report.....



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KGS ENVIRO LABORATORY PVT LTD

NABL Accredited Testing Laboratory (ISO/IEC 17025:2017)



TEST REPORT

Test Report No.: KGS/0222/TR/W-144			
Client Name & Address		M/S.RAGAVENDRA MINERALS AND CHEMICALS , Mr.E.Dhanapal(Managing Partner) , No.D/364,1st Cross ,Ukkirakaliamman Koil Street, Anna Nagar, Thennur, Trichy, Tamilnadu - 620017	
Site Location		S.F.No's 809/2, 809/3, 809/4, 809/5 (P) Extent 2.51.5 ha, Thennilai Village, Kadavur Taluk, Karur District, Tamilnadu.	
Sample Description	WW-2	Sample Reference	KGS/0222/W-144
Sample Mark	Mathagiri	Sample Drawn by	Chemist
Sample Quantity	2.0ltr	Sample Collected on	23.02.2022
Sample Received on	24.02.2022	Test Commenced on	24.02.2022
Test Completed on	28.02.2022	Test Reported on	28.02.2022

S.No.	Parameters	Units	Test Methods	Result
1	Color	Hazen	IS 3025 Part 4 :1983	<5
2	Odour	-	IS 3025 Part 5 :1983	Agreeable
3	pH@ 25°C	-	IS 3025 Part 11 :1983	7.17
4	Electrical Conductivity @ 25°C	µs/cm	IS 3025 Part 14 :1984	605
5	Turbidity	NTU	IS 3025 Part 10 :1984	< 1
6	Total Dissolved Solids	mg/l	IS 3025 Part 17 :1984	357
7	Total Hardness as CaCO ₃	mg/l	IS 3025 Part 21: 2009	151.5
8	Calcium as Ca	mg/l	IS 3025 Part 40 :1991	28.6
9	Magnesium as Mg	mg/l	IS 3025 Part 46 :1994	19.5
10	Total Alkalinity as CaCO ₃	mg/l	IS 3025 Part 23 :1984	150.2
11	Chloride as Cl ⁻	mg/l	IS 3025 Part 32 :1988	77.6
12	Sulphate as SO ₄ ²⁻	mg/l	IS 3025 Part 24:1986	26.4
13	Iron as Fe	mg/l	IS 3025 Part 53 :2003	0.12
14	Free Residual Chlorine	mg/l	IS 3025 Part 26: 1986	BDL (DL: 2.0)
15	Fluoride as F	mg/l	IS 3025 Part 60: 2008	0.11
16	Nitrates as NO ₃	mg/l	IS 3025 Part 34: 1988	10

.....Continue Report.....



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KGS ENVIRO LABORATORY PVT LTD

NABL Accredited Testing Laboratory (ISO/IEC 17025:2017)



TEST REPORT

Test Report No.: KGS/0222/TR/W-144			
Client Name & Address		M/S.RAGAVENDRA MINERALS AND CHEMICALS , Mr.E.Dhanapal(Managing Partner) , No.D/364,1st Cross ,Ukkirakaliamman Koil Street, Anna Nagar, Thennur, Trichy, Tamilnadu - 620017	
Site Location		S.F.No's 809/2, 809/3, 809/4, 809/5 (P) Extent 2.51.5 ha, Thennilai Village, Kadavur Taluk, Karur District, Tamilnadu.	
Sample Description	WW-2	Sample Reference	KGS/0222/W-144
Sample Mark	Mathagiri	Sample Drawn by	Chemist
Sample Quantity	2.0ltr	Sample Collected on	23.02.2022
Sample Received on	24.02.2022	Test Commenced on	24.02.2022
Test Completed on	28.02.2022	Test Reported on	28.02.2022

S.No.	Parameters	Units	Test Methods	Result
17	Copper as Cu	mg/l	IS 3025 Part 2: 2004	BDL (DL:0.2)
18	Manganese as Mn	mg/l	IS 3025 Part 2: 2004	BDL (DL:0.05)
19	Mercury as Hg	mg/l	IS 3025 Part 2: 2004	(BDL (DL: 0.0005)
20	Cadmium as Cd	mg/l	IS 3025 Part 2: 2004	BDL (DL:0.01)
21	Selenium as Se	mg/l	IS 3025 Part 2: 2004	BDL (DL: 0.05)
22	Aluminium as Al	mg/l	IS 3025 Part 2: 2004	BDL (DL: 0.03)
23	Lead as Pb	mg/l	IS 3025 Part 2: 2004	BDL (DL:0.01)
24	Zinc as Zn	mg/l	IS 3025 Part 2: 2004	BDL (DL:0.02)
25	Total Chromium	mg/l	IS 3025 Part 2: 2004	BDL (DL: 0.05)
26	Boron as B	mg/l	IS 3025 Part 2: 2004	BDL (DL:0.1)
27	Mineral Oil	mg/l	IS 3025 Part 39: 1991	BDL (DL:1.0)
28	Phenolic Compounds as C ₆ H ₅ OH	mg/l	IS 3025 Part 43: 1992	Absent
29	Anionic Detergents as MBAS	mg/l	IS 13428: 2005 (Annex K)	BDL (DL:0.1)
30	Cyanide as CN	mg/l	IS 3025 Part 27: 1986	Absent
31	Total Coliform	Per 100ml	IS 1622: 1981	<2
32	E-Coli	Per 100ml	IS 1622: 1981	<2

.....Continue Report.....




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KGS ENVIRO LABORATORY PVT LTD

NABL Accredited Testing Laboratory (ISO/IEC 17025:2017)



TEST REPORT

Test Report No.: KGS/0222/TR/W-144			
Client Name & Address		M/S.RAGAVENDRA MINERALS AND CHEMICALS , Mr.E.Dhanapal(Managing Partner) , No.D/364,1st Cross ,Ukkirakaliamman Koil Street, Anna Nagar, Thennur, Trichy, Tamilnadu - 620017	
Site Location		S.F.No's 809/2, 809/3, 809/4, 809/5 (P) Extent 2.51.5 ha, Thennilai Village, Kadavur Taluk, Karur District, Tamilnadu.	
Sample Description	WW-2	Sample Reference	KGS/0222/W-144
Sample Mark	Mathagiri	Sample Drawn by	Chemist
Sample Quantity	2.0ltr	Sample Collected on	23.02.2022
Sample Received on	24.02.2022	Test Commenced on	24.02.2022
Test Completed on	28.02.2022	Test Reported on	28.02.2022

S. No.	Parameters	Units	Test Methods	Result
33	Barium as Ba	mg/l	IS 13428	BDL (DL:0.5)
34	Ammonia (as Total Ammonia-N)	mg/l	IS 3025 Part 34	BDL (DL:0.1)
35	Sulphide as H ₂ S	mg/l	IS 3025 Part 29	BDL (DL:0.05)
36	Molybdenum as Mo	mg/l	IS 3025 Part 2	BDL (DL:0.5)
37	Total Arsenic as As	mg/l	IS 3025 Part 37	BDL (DL:0.01)
38	Total Suspended Solids	mg/l	IS 3025 PART17	BDL(DL:2)

.....End of Report.....




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NABL Accredited Testing Laboratory (ISO/IEC 17025:2017)



TEST REPORT

Test Report No.: KGS/0222/TR/W-143			
Client Name & Address:		M/S.RAGAVENDRA MINERALS AND CHEMICALS , Mr.E.Dhanapal(Managing Partner) , No.D/364,1st Cross ,Ukkirakaliamman Koil Street, Anna Nagar , Thennur , Trichy ,Tamilnadu - 620017	
Site Location:		S.F.No's 809/2 , 809/3 , 809 /4, 809/5 (P) Extent 2.51.5 ha ,Thennilai Village, Kadavur Taluk, Karur District, Tamilnadu.	
Sample Description	WW-1	Sample Reference	KGS/0222/W-143
Sample Mark	Thalambakoundanur	Sample Drawn by	Chemist
Sample Quantity	2.0ltr	Sample Collected on	23.02.2022
Sample Received on	24.02.2022	Test Commenced on	24.02.2022
Test Completed on	28.02.2022	Test Reported on	28.02.2022

S.No.	Parameters	Units	Test Methods	Result
1	Color	Hazen	IS 3025 Part 4 :1983	< 5
2	Odour	-	IS 3025 Part 5 :1983	Agreeable
3	pH@ 25°C	-	IS 3025 Part 11 :1983	6.68
4	Electrical Conductivity @ 25°C	µs/cm	IS 3025 Part 14 :1984	620
5	Turbidity	NTU	IS 3025 Part 10 :1984	< 1
6	Total Dissolved Solids	mg/l	IS 3025 Part 17 :1984	366
7	Total Hardness as CaCO ₃	mg/l	IS 3025 Part 21: 2009	137.0
8	Calcium as Ca	mg/l	IS 3025 Part 40 :1991	21.8
9	Magnesium as Mg	mg/l	IS 3025 Part 46 :1994	20.1
10	Total Alkalinity as CaCO ₃	mg/l	IS 3025 Part 23 :1984	155
11	Chloride as Cl ⁻	mg/l	IS 3025 Part 32 :1988	80.6
12	Sulphate as SO ₄ ⁻²	mg/l	IS 3025 Part 24:1986	27
13	Iron as Fe	mg/l	IS 3025 Part 53 :2003	0.15
14	Free Residual Chlorine	mg/l	IS 3025 Part 26: 1986	BDL(DL: 2.0)
15	Fluoride as F	mg/l	IS 3025 Part 60 : 2008	0.19
16	Nitrates as NO ₃	mg/l	IS 3025 Part 34: 1988	7.3
17	Copper as Cu	mg/l	IS 3025 Part 2 : 2004	BDL (DL:0.2)
18	Manganese as Mn	mg/l	IS 3025 Part 2 : 2004	BDL (DL:0.05)
19	Mercury as Hg	mg/l	IS 3025 Part 2 : 2004	(BDL (DL: 0.0005)
20	Cadmium as Cd	mg/l	IS 3025 Part 2 : 2004	BDL (DL:0.01)

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TEST REPORT

Test Report No.: KGS/0222/TR/W-143			
Client Name & Address:		M/S.RAGAVENDRA MINERALS AND CHEMICALS, Mr.E.Dhanapal(Managing Partner) , No.D/364,1st Cross ,Ukkirakaliamman Koil Street, Anna Nagar , Thennur , Trichy ,Tamilnadu - 620017	
Site Location:		S.F.No's 809/2 , 809/ 3 , 809 /4, 809/5 (P) Extent 2.51.5 ha ,Thennilai Village, Kadavur Taluk, Karur District, Tamilnadu.	
Sample Description	WW-1	Sample Reference	KGS/0222/W-143
Sample Mark	Thalambakoundanur	Sample Drawn by	Chemist
Sample Quantity	2.0ltr	Sample Collected on	23.02.2022
Sample Received on	24.02.2022	Test Commenced on	24.02.2022
Test Completed on	28.02.2022	Test Reported on	28.02.2022

S.No.	Parameters	Units	Test Methods	Result
21	Selenium as Se	mg/l	IS 3025 Part 2 : 2004	BDL (DL.: 0.05)
22	Aluminium as Al	mg/l	IS 3025 Part 2 : 2004	BDL (DL.: 0.03)
23	Lead as Pb	mg/l	IS 3025 Part 2 : 2004	BDL (DL.:0.01)
24	Zinc as Zn	mg/l	IS 3025 Part 2 : 2004	BDL (DL.:0.02)
25	Total Chromium	mg/l	IS 3025 Part 2 : 2004	BDL (DL.: 0.05)
26	Boron as B	mg/l	IS 3025 Part 2 : 2004	BDL (DL.:0.1)
27	Mineral Oil	mg/l	IS 3025 Part 39 : 1991	BDL (DL.:1.0)
28	Phenolic Compunds as C ₆ H ₅ OH	mg/l	IS 3025 Part 43 : 1992	Absent
29	Anionic Detergents as MBAS	mg/l	IS 13428: 2005 (Annex K)	BDL (DL.:0.1)
30	Cynaide as CN	mg/l	IS 3025 Part 27 : 1986	Absent
31	Total Coliform	Per 100ml	IS 1622 : 1981	< 2
32	E-Coli	Per 100ml	IS 1622 : 1981	< 2
33	Barium as Ba	mg/l	IS 13428	BDL (DL.:0.5)
34	Ammonia (as Total Ammonia-N)	mg/l	IS 3025 Part 34	BDL (DL.:0.1)
35	Sulphide as H ₂ S	mg/l	IS 3025 Part 29	BDL (DL.:0.05)
36	Molybdenum as Mo	mg/l	IS 3025 Part 2	BDL (DL.:0.5)
37	Total Arsenic as As	mg/l	IS 3025 Part 37	BDL (DL.:0.01)
38	Total Suspended Solids	mg/l	IS 3025 PART17	BDL(DL.:2)

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KGS ENVIRO LABORATORY PVT LTD

NABL Accredited Testing Laboratory (ISO/IEC 17025:2017)



Test Report No.: KGS/0222/TR/W-142

TEST REPORT

Client Name & Address:		M/S.RAGAVENDRA MINERALS AND CHEMICALS , Mr.E.Dhanapal(Managing Partner) , No.D/364,1st Cross ,Ukkirakaliamman Koil Street, Anna Nagar , Thennur , Trichy ,Tamilnadu - 620017	
Site Location:		S.F.No's 809/2 , 809/ 3 , 809 / 4, 809/5 (P) Extent 2.51.5 ha ,Thennilai Village, Kadavur Taluk, Karur District, Tamilnadu.	
Sample Description	SW-2	Sample Reference	KGS/0222/W-142
Sample Mark	Core Zone (PIT WATER)	Sample Drawn by	Chemist
Sample Quantity	2.0ltr	Sample Collected on	23.02.2022
Sample Received on	24.02.2022	Test Commenced on	24.02.2022
Test Completed on	28.02.2022	Test Reported on	28.02.2022

S.No.	Parameters	Units	Test Methods	Result
1	Color	Hazen	IS 3025 Part 4 :1983	5
2	Odour	-	IS 3025 Part 5 :1983	Agreeable
3	pH@ 25°C	-	IS 3025 Part 11 :1983	7.19
4	Electrical Conductivity @ 25°C	µs/cm	IS 3025 Part 14 :1984	642
5	Turbidity	NTU	IS 3025 Part 10 :1984	4.1
6	Total Dissolved Solids	mg/l	IS 3025 Part 17 :1984	380
7	Total Hardness as CaCO ₃	mg/l	IS 3025 Part 21: 2009	165.6
8	Calcium as Ca	mg/l	IS 3025 Part 40 :1991	31.8
9	Magnesium as Mg	mg/l	IS 3025 Part 46 :1994	21
10	Total Alkalinity as CaCO ₃	mg/l	IS 3025 Part 23 :1984	162
11	Chloride as Cl ⁻	mg/l	IS 3025 Part 32 :1988	84.6
12	Sulphate as SO ₄ ⁻	mg/l	IS 3025 Part 24:1986	31
13	Iron as Fe	mg/l	IS 3025 Part 53 :2003	0.10
14	Free Residual Chlorine	mg/l	IS 3025 Part 26: 1986	BDL(DL: 2.0)
15	Fluoride as F	mg/l	IS 3025 Part 60 : 2008	0.13
16	Nitrates as NO ₃	mg/l	IS 3025 Part 34: 1988	7.5
17	Copper as Cu	mg/l	IS 3025 Part 2 : 2004	BDL (DL:0.2)
18	Manganese as Mn	mg/l	IS 3025 Part 2 : 2004	BDL (DL:0.05)
19	Mercury as Hg	mg/l	IS 3025 Part 2 : 2004	(BDL (DL: 0.0005)
20	Cadmium as Cd	mg/l	IS 3025 Part 2 : 2004	BDL (DL:0.01)
21	Selenium as Se	mg/l	IS 3025 Part 2 : 2004	BDL (DL: 0.05)
22	Aluminium as Al	mg/l	IS 3025 Part 2 : 2004	BDL (DL: 0.03)

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NABL Accredited Testing Laboratory (ISO/IEC 17025:2017)



Test Report No.: KGS/0222/TR/W-142

TEST REPORT

Client Name & Address:

M/S.RAGAVENDRA MINERALS AND CHEMICALS ,
Mr.E.Dhanapal(Managing Partner) ,
No.D/364,1st Cross ,Ukkirakaliamman Koil Street,
Anna Nagar , Thennur , Trichy ,Tamilnadu - 620017

Site Location:

S.F.No's 809/2 , 809/3 , 809 / 4, 809/5 (P)
Extent 2.51.5 ha ,Thennilai Village, Kadavur Taluk,
Karur District, Tamilnadu.

Sample Description	SW-2	Sample Reference	KGS/0222/W-142
Sample Mark	Core Zone (PIT WATER)	Sample Drawn by	Chemist
Sample Quantity	2.0ltr	Sample Collected on	23.02.2022
Sample Received on	24.02.2022	Test Commenced on	24.02.2022
Test Completed on	28.02.2022	Test Reported on	28.02.2022

S.No.	Parameters	Units	Test Methods	Result
23	Lead as Pb	mg/l	IS 3025 Part 2 : 2004	BDL (DL:0.01)
24	Zinc as Zn	mg/l	IS 3025 Part 2 : 2004	BDL (DL:0.02)
25	Total Chromium	mg/l	IS 3025 Part 2 : 2004	BDL (DL: 0.05)
26	Boron as B	mg/l	IS 3025 Part 2 : 2004	BDL (DL:0.1)
27	Mineral Oil	mg/l	IS 3025 Part 39 : 1991	BDL (DL:1.0)
28	Phenolic Compunds as C ₆ H ₅ OH	mg/l	IS 3025 Part 43 : 1992	Absent
29	Anionic Detergents as MBAS	mg/l	IS 13428: 2005 (Annex K)	BDL (DL:0.1)
30	Cynaide as CN	mg/l	IS 3025 Part 27 : 1986	Absent
31	Biological Oxygen Demand, 3 days @ 27°C	mg/l	IS 3025 Part 44	5.7
32	Chemical Oxygen Demand	mg/l	IS 3025 Part 58	24
33	Dissolved Oxygen	mg/l	IS 3025 Part 39	5.8
34	Total Coliform	Per 100ml	IS 1622 : 1981	present
35	E-Coli	Per 100ml	IS 1622 : 1981	present
36	Barium as Ba	mg/l	IS 13428	BDL (DL:0.5)
37	Ammonia (as Total Ammonia-N)	mg/l	IS 3025 Part 34	1.3
38	Sulphide as H ₂ S	mg/l	IS 3025 Part 29	BDL (DL:0.05)
39	Molybdenum as Mo	mg/l	IS 3025 Part 2	BDL (DL:0.5)
40	Total Arsenic as As	mg/l	IS 3025 Part 37	BDL (DL:0.01)
41	Total Suspended Solids	mg/l	IS 3025 PART17	10.2

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KGS ENVIRO LABORATORY PVT LTD

NABL Accredited Testing Laboratory (ISO/IEC 17025:2017)



TEST REPORT

Test Report No.: KGS/0222/TR/W-141			
Client Name & Address		M/S.RAGAVENDRA MINERALS AND CHEMICALS, Mr.E.Dhanapal(Managing Partner), No.D/364,1st Cross ,Ukkirakaliamman Koil Street, Anna Nagar , Thennur , Trichy ,Tamilnadu - 620017	
Site Location		S.F.Nos 809/2 , 809/ 3 , 809 / 4, 809/5 (P) Extent 2.51.5 ha, Thennilai Village, Kadavur Taluk, Karur District, Tamilnadu.	
Sample Description	SW-1	Sample Reference	KGS/0222/W-141
Sample Mark	Tank Near Sheriwali	Sample Drawn by	Chemist
Sample Quantity	2.0ltr	Sample Collected on	23.02.2022
Sample Received on	24.02.2022	Test Commenced on	24.02.2022
Test Completed on	28.02.2022	Test Reported on	28.02.2022

S.No.	Parameters	Units	Test Methods	Result
1	Color	Hazen	IS 3025 Part 4 :1983	5
2	Odour	-	IS 3025 Part 5 :1983	Agreeable
3	pH@ 25°C	-	IS 3025 Part 11 :1983	7.28
4	Electrical Conductivity @ 25°C	µs/cm	IS 3025 Part 14 :1984	714
5	Turbidity	NTU	IS 3025 Part 10 :1984	2.5
6	Total Dissolved Solids	mg/l	IS 3025 Part 17 :1984	421
7	Total Hardness as CaCO ₃	mg/l	IS 3025 Part 21: 2009	180.6
8	Calcium as Ca	mg/l	IS 3025 Part 40 :1991	35.5
9	Magnesium as Mg	mg/l	IS 3025 Part 46 :1994	22.4
10	Total Alkalinity as CaCO ₃	mg/l	IS 3025 Part 23 :1984	170
11	Chloride as Cl ⁻	mg/l	IS 3025 Part 32 :1988	110
12	Sulphate as SO ₄ ²⁻	mg/l	IS 3025 Part 24:1986	34.1
13	Iron as Fe	mg/l	IS 3025 Part 53 :2003	0.12
14	Free Residual Chlorine	mg/l	IS 3025 Part 26: 1986	BDL(DL: 2.0)
15	Fluoride as F	mg/l	IS 3025 Part 60 : 2008	0.13
16	Nitrates as NO ₃	mg/l	IS 3025 Part 34: 1988	5

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TEST REPORT

Test Report No.: KGS/0222/TR/W-141			
Client Name & Address		M/S.RAGAVENDRA MINERALS AND CHEMICALS, Mr.E.Dhanapal(Managing Partner) , No.D/364,1st Cross ,Ukkirakaliamman Koil Street, Anna Nagar , Thennur , Trichy ,Tamilnadu - 620017	
Site Location		S.F.Nos 809/2 , 809/ 3 , 809 / 4, 809/5 (P) Extent 2.51.5 ha, Thennilai Village, Kadavur Taluk, Karur District, Tamilnadu.	
Sample Description	SW-1	Sample Reference	KGS/0222/W-141
Sample Mark	Tank Near Sheriwali	Sample Drawn by	Chemist
Sample Quantity	2.0ltr	Sample Collected on	23.02.2022
Sample Received on	24.02.2022	Test Commenced on	24.02.2022
Test Completed on	28.02.2022	Test Reported on	28.02.2022

S.No.	Parameters	Units	Test Methods	Result
17	Copper as Cu	mg/l	IS 3025 Part 2 : 2004	BDL (DL:0.2)
18	Manganese as Mn	mg/l	IS 3025 Part 2 : 2004	BDL (DL:0.05)
19	Mercury as Hg	mg/l	IS 3025 Part 2 : 2004	(BDL (DL: 0.0005)
20	Cadmium as Cd	mg/l	IS 3025 Part 2 : 2004	BDL (DL:0.01)
21	Selenium as Se	mg/l	IS 3025 Part 2 : 2004	BDL (DL: 0.05)
22	Aluminium as Al	mg/l	IS 3025 Part 2 : 2004	BDL (DL: 0.03)
23	Lead as Pb	mg/l	IS 3025 Part 2 : 2004	BDL (DL:0.01)
24	Zinc as Zn	mg/l	IS 3025 Part 2 : 2004	BDL (DL:0.02)
25	Total Chromium	mg/l	IS 3025 Part 2 : 2004	BDL (DL: 0.05)
26	Boron as B	mg/l	IS 3025 Part 2 : 2004	BDL (DL:0.1)
27	Mineral Oil	mg/l	IS 3025 Part 39 : 1991	BDL (DL:1.0)
28	Phenolic Compounds as C ₆ H ₅ OH	mg/l	IS 3025 Part 43 : 1992	Absent
29	Anionic Detergents as MBAS	mg/l	IS 13428: 2005 (Annex K)	BDL (DL:0.1)
30	Cynaide as CN	mg/l	IS 3025 Part 27 : 1986	Absent
31	Biological Oxygen Demand, 3 days @ 27°C	mg/l	IS 3025 Part 44	8.1
32	Chemical Oxygen Demand	mg/l	IS 3025 Part 58	36

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KGS ENVIRO LABORATORY PVT LTD

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TEST REPORT

Test Report No.: KGS/0222/TR/W-141			
Client Name & Address		M/S.RAGAVENDRA MINERALS AND CHEMICALS , Mr.E.Dhanapal(Managing Partner) , No.D/364,1st Cross ,Ukkirakaliamman Koil Street, Anna Nagar , Thennur , Trichy ,Tamilnadu - 620017	
Site Location		S.F.Nos 809/2 , 809/ 3 , 809 / 4, 809/5 (P) Extent 2.51.5 ha, Thennilai Village, Kadavur Taluk, Karur District, Tamilnadu.	
Sample Description	SW-1	Sample Reference	KGS/0222/W-141
Sample Mark	Tank Near Sheriwali	Sample Drawn by	Chemist
Sample Quantity	2.0ltr	Sample Collected on	23.02.2022
Sample Received on	24.02.2022	Test Commenced on	24.02.2022
Test Completed on	28.02.2022	Test Reported on	28.02.2022

S.No.	Parameters	Units	Test Methods	Result
33	Dissolved Oxygen	mg/l	IS 3025 Part 39	6
34	Total Coliform	Per 100ml	IS 1622 : 1981	present
35	E-Coli	Per 100ml	IS 1622 : 1981	present
36	Barium as Ba	mg/l	IS 13428	BDL (DL:0.5)
37	Ammonia (as Total Ammonia-N)	mg/l	IS 3025 Part 34	1.1
38	Sulphide as H ₂ S	mg/l	IS 3025 Part 29	BDL (DL:0.05)
39	Molybdenum as Mo	mg/l	IS 3025 Part 2	BDL (DL:0.5)
40	Total Arsenic as As	mg/l	IS 3025 Part 37	BDL (DL:0.01)
41	Total Suspended Solids	mg/l	IS 3025 PART17	8.3

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TEST REPORT

Test Report No.: KGS/0222/TR\S- 140			
Client Name & Address		M/S.RAGAVENDRA MINERALS AND CHEMICALS , Mr.E.Dhanapal(Managing Partner) , No.D/364,1st Cross ,Ukkirakaliamman Koil Street, Anna Nagar , Thennur , Trichy ,Tamilnadu - 620017	
Site Location		S.F.No's 809/2 , 809/ 3 , 809 / 4, 809/5 (P) Extent 2.51.5 ha ,Thennilai Village, Kadavur Taluk, Karur District, Tamilnadu.	
Sample Code		S-06	
Sample Description	SOIL	Sample Reference	KGS/0222/S-40
Sample Mark	Mathagiri	Sample Drawn by	Chemist
Sample Quantity	2.0 Kg	Sample Collected on	23.02.2022
Sample Received on	24.02.2022	Test Commenced on	24.02.2022
Test Completed on	28.02.2022	Test Reported on	28.02.2022

S. No	Parameters	Units	Test Methods	Result
1	pH at 27°C	-	IS 2720Part 26-1987(RA2011)	8.51
2	Electrical Conductivity at 25°C	µs/cm	IS 14767 : 2000 (RA 2010)	425
3	Texture	-	IS 2720 PART 2 (RA 2010)	Clay Loam
4	Sand	%	Food and Agriculture Organization of the United Nations Rome, 2007	32.6
5	Silt	%		34.5
6	Clay	%		32.9
7	Water Holding Capacity	%		49.1
8	Bulk Density	g/cc		1.02
9	Porosity	%		41
10	Exchangeable Calcium(asCa)	mg/Kg		152

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KGS ENVIRO LABORATORY PVT LTD

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TEST REPORT

Test Report No.: KGS/0222/TR\S- 140			
Client Name & Address		M/S.RAGAVENDRA MINERALS AND CHEMICALS , Mr.E.Dhanapal(Managing Partner) , No.D/364,1st Cross ,Ukkirakaliamman Koil Street, Anna Nagar , Thennur , Trichy ,Tamilnadu - 620017	
Site Location		S.F.No's 809/2 , 809/ 3 , 809 / 4, 809/5 (P) Extent 2.51.5 ha ,Thennilai Village, Kadavur Taluk, Karur District, Tamilnadu.	
Sample Code		S-06	
Sample Description	SOIL	Sample Reference	KGS/0222/S-40
Sample Mark	Mathagiri	Sample Drawn by	Chemist
Sample Quantity	2.0 Kg	Sample Collected on	23.02.2022
Sample Received on	24.02.2022	Test Commenced on	24.02.2022
Test Completed on	28.02.2022	Test Reported on	28.02.2022

S. No	Parameters	Units	Test Methods	Result
11	Exchangeable Magnesium (as Mg)	mg/Kg	Food and Agriculture Organization of the United Nations Rome, 2007	24.3
12	Exchangeable Manganese (as Mn)	mg/Kg		27
13	Exchangeable Zinc as Zn	mg/Kg		0.59
14	Available Boron (as B)	mg/Kg		0.61
15	Soluble Chloride (as Cl)	mg/Kg		210
16	Soluble Sulphate (as SO ₄)	mg/Kg		95
17	Available Potassium (as K)	mg/Kg		23
18	Available Phosphorous (as P)	Kg/hect		0.92
19	Available Nitrogen (as N)	Kg/hect		192
20	Cadmium (as Cd)	mg/Kg		BDL(DL:0.003)

.....Continue Report.....



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TEST REPORT

Test Report No.: KGS/0222/TRVS- 140			
Client Name & Address		M/S.RAGAVENDRA MINERALS AND CHEMICALS , Mr.E.Dhanapal(Managing Partner) , No.D/364,1st Cross ,Ukkirakaliamman Koil Street, Anna Nagar , Thennur , Trichy ,Tamilnadu - 620017	
Site Location		S.F.No's 809/2 , 809/ 3 , 809 / 4, 809/5 (P) Extent 2.51.5 ha ,Thennilai Village, Kadavur Taluk, Karur District, Tamilnadu.	
Sample Code		S-06	
Sample Description	SOIL	Sample Reference	KGS/0222/S-40
Sample Mark	Mathagiri	Sample Drawn by	Chemist
Sample Quantity	2.0 Kg	Sample Collected on	23.02.2022
Sample Received on	24.02.2022	Test Commenced on	24.02.2022
Test Completed on	28.02.2022	Test Reported on	28.02.2022

S. No	Parameters	Units	Test Methods	Result
21	Chromium (asCr)	mg/Kg	Food and Agriculture Organization of the United Nations Rome, 2007	BDL (DL:0.05)
22	Copper(asCu)	mg/Kg		BDL (DL:0.05)
23	Lead (asPb)	mg/Kg		0.41
24	Total Iron	mg/Kg		2.66
25	Organic Matter	%		1.68
26	Organic Carbon	%		0.98
27	CEC	meq/100g		38.1

.....End of Report.....




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TEST REPORT

Test Report No.: KGS/0222/TR\S- 139

Client Name & Address		M/S.RAGAVENDRA MINERALS AND CHEMICALS , Mr.E.Dhanapal(Managing Partner) , No.D/364,1st Cross ,Ukkirakaliamman Koil Street, Anna Nagar , Thennur , Trichy ,Tamilnadu - 620017	
Site Location		S.F.No's 809/2 , 809/ 3 , 809 / 4, 809/5 (P) Extent 2.51.5 ha ,Thennilai Village, Kadavur Taluk, Karur District, Tamilnadu.	
Sample Code		S-05	
Sample Description	SOIL	Sample Reference	KGS/0222/S-139
Sample Mark	Mamarathupatti	Sample Drawn by	Chemist
Sample Quantity	2.0 Kg	Sample Collected on	23.02.2022
Sample Received on	24.02.2022	Test Commenced on	24.02.2022
Test Completed on	28.02.2022	Test Reported on	28.02.2022

S. No	Parameters	Units	Test Methods	Result
1	pH at 27°C	-	IS 2720Part 26-1987(RA2011)	8.62
2	Electrical Conductivity at 25°C	µs/cm	IS 14767 : 2000 (RA 2010)	415
3	Texture	-	IS 2720 PART 2 (RA 2010)	Clay Loam
4	Sand	%	Food and Agriculture Organization of the United Nations Rome, 2007	37.1
5	Silt	%		35.0
6	Clay	%		27.9
7	Water Holding Capacity	%		44.1
8	Bulk Density	g/cc		1.13
9	Porosity	%		31.6
10	Exchangeable Calcium (as Ca)	mg/Kg		139

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No.16, Fl, Bharathi Flats, Bharathiyar Street, Cholambedu Main Road, Thirumullaivoyal, Chennai - 600 062.

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TEST REPORT

Test Report No.: KGS/0222/TR/S- 139

Client Name & Address		M/S.RAGAVENDRA MINERALS AND CHEMICALS , Mr.E.Dhanapal(Managing Partner) , No.D/364,1st Cross ,Ukkirakaliamman Koil Street, Anna Nagar , Thennur , Trichy ,Tamilnadu - 620017	
Site Location		S.F.No's 809/2 , 809/ 3 , 809 / 4, 809/5 (P) Extent 2.51.5 ha ,Thennilai Village, Kadavur Taluk, Karur District, Tamilnadu.	
Sample Code		S-05	
Sample Description	SOIL	Sample Reference	KGS/0222/S-139
Sample Mark	Mamarathupatti	Sample Drawn by	Chemist
Sample Quantity	2.0 Kg	Sample Collected on	23.02.2022
Sample Received on	24.02.2022	Test Commenced on	24.02.2022
Test Completed on	28.02.2022	Test Reported on	28.02.2022

S. No	Parameters	Units	Test Methods	Result
11	Exchangeable Magnesium (as Mg)	mg/Kg	Food and Agriculture Organization of the United Nations Rome, 2007	21.5
12	Exchangeable Manganese (as Mn)	mg/Kg		18.5
13	Exchangeable Zinc as Zn	mg/Kg		1.31
14	Available Boron (as B)	mg/Kg		1.08
15	Soluble Chloride (as Cl)	mg/Kg		133
16	Soluble Sulphate (as SO ₄)	mg/Kg		141
17	Available Potassium (as K)	mg/Kg		45
18	Available Phosphorous (as P)	Kg/hect		1.19
19	Available Nitrogen (as N)	Kg/hect		195
20	Cadmium (as Cd)	mg/Kg		BDL (DL:0.003)

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TEST REPORT

Test Report No.: KGS/0222/TR\S- 139			
Client Name & Address		M/S.RAGAVENDRA MINERALS AND CHEMICALS , Mr.E.Dhanapal(Managing Partner) , No.D/364,1st Cross ,Ukkirakaliamman Koil Street, Anna Nagar , Thennur , Trichy ,Tamilnadu - 620017	
Site Location		S.F.No's 809/2 , 809/ 3 , 809 / 4, 809/5 (P) Extent 2.51.5 ha ,Thennilai Village, Kadavur Taluk, Karur District, Tamilnadu.	
Sample Code		S-05	
Sample Description	SOIL	Sample Reference	KGS/0222/S-139
Sample Mark	Mamarathupatti	Sample Drawn by	Chemist
Sample Quantity	2.0 Kg	Sample Collected on	23.02.2022
Sample Received on	24.02.2022	Test Commenced on	24.02.2022
Test Completed on	28.02.2022	Test Reported on	28.02.2022

S. No	Parameters	Units	Test Methods	Result
21	Chromium (asCr)	mg/Kg	Food and Agriculture Organization of the United Nations Rome, 2007	BDL (DL:0.05)
22	Copper(asCu)	mg/Kg		BDL (DL:0.05)
23	Lead (asPb)	mg/Kg		1.17
24	Total Iron	mg/Kg		1.22
25	Organic Matter	%		1.68
26	Organic Carbon	%		0.98
27	CEC	meq/100g		45.3

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TEST REPORT

Test Report No.: KGS/0222/TR\S- 138			
Client Name & Address		M/S.RAGAVENDRA MINERALS AND CHEMICALS , Mr.E.Dhanapal(Managing Partner) , No.D/364,1st Cross ,Ukkirakaliamman Koil Street, Anna Nagar , Thennur , Trichy ,Tamilnadu - 620017	
Site Location		S.F.No's 809/2 , 809/ 3 , 809 / 4, 809/5 (P) Extent 2.51.5 ha,Thennilai Village, Kadavur Taluk, Karur District, Tamilnadu.	
Sample Code		S -04	
Sample Description	SOIL	Sample Reference	KGS/0222/S-138
Sample Mark	Chinnatampatti	Sample Drawn by	Chemist
Sample Quantity	2.0 Kg.	Sample Collected on	23.02.2022
Sample Received on	24.02.2022	Test Commenced on	24.02.2022
Test Completed on	28.02.2022	Test Reported on	28.02.2022

S. No	Parameters	Units	Test Methods	Result
1	pH at 27°C	-	IS 2720Part 26-1987(RA2011)	8.69
2	Electrical Conductivityat25C	µs/cm	IS 14767 : 2000 (RA 2010)	370
3	Texture	-	IS 2720 PART 2 (RA 2010)	Clay Loam
4	Sand	%	Food and Agriculture Organization of the United Nations Rome. 2007	36.6
5	Silt	%		32.5
6	Clay	%		30.9
7	Water Holding Capacity	%		49
8	Bulk Density	g/cc		1.16
9	Porosity	%		31.5
10	Exchangeable Calcium (as Ca)	mg/Kg		168

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TEST REPORT

Test Report No.: KGS/0222/TR\S- 138			
Client Name & Address		M/S.RAGAVENDRA MINERALS AND CHEMICALS , Mr.E.Dhanapal(Managing Partner) , No.D/364,1st Cross ,Ukkirakaliamman Koil Street, Anna Nagar , Thennur , Trichy ,Tamilnadu - 620017	
Site Location		S.F.No's 809/2 , 809/ 3 , 809 / 4, 809/5 (P) Extent 2.51.5 ha,Thennilai Village, Kadavur Taluk, Karur District, Tamilnadu.	
Sample Code		S -04	
Sample Description	SOIL	Sample Reference	KGS/0222/S-138
Sample Mark	Chinnatampatti	Sample Drawn by	Chemist
Sample Quantity	2.0 Kg	Sample Collected on	23.02.2022
Sample Received on	24.02.2022	Test Commenced on	24.02.2022
Test Completed on	28.02.2022	Test Reported on	28.02.2022

S. No	Parameters	Units	Test Methods	Result
11	Exchangeable Magnesium (as Mg)	mg/Kg	Food and Agriculture Organization of the United Nations Rome, 2007	35
12	Exchangeable Manganese (as Mn)	mg/Kg		32.9
13	Exchangeable Zinc as Zn	mg/Kg		1.08
14	Available Boron (as B)	mg/Kg		0.97
15	Soluble Chloride (as Cl)	mg/Kg		124
16	Soluble Sulphate (as SO ₄)	mg/Kg		123
17	Available Potassium (as K)	mg/Kg		39.5
18	Available Phosphorous (as P)	Kg/hect		1.25
19	Available Nitrogen (as N)	Kg/hect		174.2
20	Cadmium (as Cd)	mg/Kg		BDL (DL:0.003)

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TEST REPORT

Test Report No.: KGS/0222/TR\S- 138			
Client Name & Address		M/S.RAGAVENDRA MINERALS AND CHEMICALS , Mr.E.Dhanapal(Managing Partner) , No.D/364,1st Cross ,Ukkirakaliamman Koil Street, Anna Nagar , Thennur , Trichy ,Tamilnadu - 620017	
Site Location		S.F.No's 809/2 , 809/ 3 , 809 / 4, 809/5 (P) Extent 2.51,5 ha,Thennilai Village, Kadavur Taluk, Karur District, Tamilnadu.	
Sample Code		S -04	
Sample Description	SOIL	Sample Reference	KGS/0222/S-138
Sample Mark	Chinnatampatti	Sample Drawn by	Chemist
Sample Quantity	2.0 Kg	Sample Collected on	23.02.2022
Sample Received on	24.02.2022	Test Commenced on	24.02.2022
Test Completed on	28.02.2022	Test Reported on	28.02.2022

S. No	Parameters	Units	Test Methods	Result
21	Chromium (asCr)	mg/Kg	Food and Agriculture Organization of the United Nations Rome, 2007	BDL (DL:0.05)
22	Copper(asCu)	mg/Kg		BDL (DL:0.05)
23	Lead (asPb)	mg/Kg		1.55
24	Total Iron	mg/Kg		2.09
25	Organic Matter	%		2.20
26	Organic Carbon	%		1.28
27	CEC	meq/100g		41.9

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TEST REPORT

Test Report No.: KGS/0222/TR\S- 137			
Client Name & Address		M/S.RAGAVENDRA MINERALS AND CHEMICALS , Mr.E.Dhanapal(Managing Partner) , No.D/364,1st Cross ,Ukkirakaliamman Koil Street, Anna Nagar , Thennur , Trichy ,Tamilnadu - 620017	
Site Location		S.F.No's 809/2 , 809/ 3 , 809 / 4 , 809/5 (P) Extent 2.51.5 ha ,Thennilai Village, Kadavur Taluk, Karur District, Tamilnadu.	
Sample Code		S-03	
Sample Description	SOIL	Sample Reference	KGS/0222/S-137
Sample Mark	Thalambakoundanur	Sample Drawn by	Chemist
Sample Quantity	2.0 Kg	Sample Collected on	23.02.2022
Sample Received on	24.02.2022	Test Commenced on	24.02.2022
Test Completed on	28.02.2022	Test Reported on	28.02.2022

S. No	Parameters	Units	Test Methods	Result
1	pH at 27°C	-	IS 2720 Part 26-1987(RA2011)	8.72
2	Electrical Conductivity at 25°C	µs/cm	IS 14767 : 2000 (RA 2010)	453
3	Texture	-	IS 2720 PART 2 (RA 2010)	Clay Loam
4	Sand	%	Food and Agriculture Organization of the United Nations Rome, 2007	32.1
5	Silt	%		38.5
6	Clay	%		29.4
7	Water Holding Capacity	%		40.8
8	Bulk Density	g/cc		0.94
9	Porosity	%		27.8
10	Exchangeable Calcium(asCa)	mg/Kg		135

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TEST REPORT

Test Report No.: KGS/0222/TRVS- 137			
Client Name & Address		M/S.RAGAVENDRA MINERALS AND CHEMICALS , Mr.E.Dhanapal(Managing Partner) , No.D/364,1st Cross ,Ukkirakaliamman Koil Street, Anna Nagar , Thennur , Trichy ,Tamilnadu - 620017	
Site Location		S.F.No's 809/2 , 809/ 3 , 809 / 4, 809/5 (P) Extent 2.51.5 ha ,Thennilai Village, Kadavur Taluk, Karur District, Tamilnadu.	
Sample Code		S-03	
Sample Description	SOIL	Sample Reference	KGS/0222/S-137
Sample Mark	Thalambakoundanur	Sample Drawn by	Chemist
Sample Quantity	2.0 Kg	Sample Collected on	23.02.2022
Sample Received on	24.02.2022	Test Commenced on	24.02.2022
Test Completed on	28.02.2022	Test Reported on	28.02.2022

S. No	Parameters	Units	Test Methods	Result
11	Exchangeable Magnesium (as Mg)	mg/Kg	Food and Agriculture Organization of the United Nations Rome, 2007	25.4
12	Exchangeable Manganese (as Mn)	mg/Kg		27.5
13	Exchangeable Zinc as Zn	mg/Kg		0.94
14	Available Boron (as B)	mg/Kg		0.68
15	Soluble Chloride (as Cl)	mg/Kg		155
16	Soluble Sulphate (as SO ₄)	mg/Kg		145
17	Available Potassium (as K)	mg/Kg		44
18	Available Phosphorous (as P)	Kg/hect		0.78
19	Available Nitrogen (as N)	Kg/hect		164.2

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TEST REPORT

Test Report No.: KGS/0222/TR\S- 137			
Client Name & Address		M/S.RAGAVENDRA MINERALS AND CHEMICALS , Mr.E.Dhanapal(Managing Partner) , No.D/364,1st Cross ,Ukkirakaliamman Koil Street, Anna Nagar , Thennur , Trichy ,Tamilnadu - 620017	
Site Location		S.F.No's 809/2 , 809/ 3 , 809 / 4, 809/5 (P) Extent 2.51.5 ha ,Thennilai Village, Kadavur Taluk, Karur District, Tamilnadu.	
Sample Code		S-03	
Sample Description	SOIL	Sample Reference	KGS/0222/S-137
Sample Mark	Thalambakoundanur	Sample Drawn by	Chemist
Sample Quantity	2.0 Kg	Sample Collected on	23.02.2022
Sample Received on	24.02.2022	Test Commenced on	24.02.2022
Test Completed on	28.02.2022	Test Reported on	28.02.2022

S. No	Parameters	Units	Test Methods	Result
20	Cadmium (as Cd)	mg/Kg	Food and Agriculture Organization of the United Nations Rome, 2007	BDL (DL:0.05)
21	Chromium (asCr)	mg/Kg		BDL (DL:0.05)
22	Copper(asCu)	mg/Kg		0.80
23	Lead (asPb)	mg/Kg		1.88
24	Total Iron	mg/Kg		2.29
25	Organic Matter	%		1.33
26	Organic Carbon	%		37.8
27	CEC	meq/100g		BDL (DL:0.05)

.....End of Report.....




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KGS ENVIRO LABORATORY PVT LTD

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TEST REPORT

Test Report No.: KGS/0222/TR\S- 136			
Client Name & Address		M/S.RAGAVENDRA MINERALS AND CHEMICALS , Mr.E.Dhanapal(Managing Partner) , No.D/364,1st Cross ,Ukkirakaliamman Koil Street, Anna Nagar , Thennur , Trichy ,Tamilnadu - 620017	
Site Location		S.F.No's 809/2 , 809/ 3 , 809 / 4, 809/5 (P) Extent 2.51.5 ha ,Thennilai Village, Kadavur Taluk, Karur District, Tamilnadu.	
Sample Code		S-02	
Sample Description	SOIL	Sample Reference	KGS/0222/S-136
Sample Mark	Core Zone	Sample Drawn by	Chemist
Sample Quantity	2.0 Kg	Sample Collected on	23.02.2022
Sample Received on	24.02.2022	Test Commenced on	24.02.2022
Test Completed on	28.02.2022	Test Reported on	28.02.2022

S. No	Parameters	Units	Test Methods	Result
1	pHat27C	-	IS 2720Part 26-1987(RA2011)	8.68
2	ElectricalConductivityat25C	µs/cm	IS 14767 : 2000 (RA 2010)	555
3	Texture	-	IS 2720 PART 2 (RA 2010)	Clay Loam
4	Sand	%	Food and Agriculture Organization of the United Nations Rome, 2007	35.1
5	Slit	%		33.5
6	Clay	%		31.4
7	Water Holding Capacity	%		46.1
8	Bulk Density	g/cc		1.03
9	Porosity	%		26.8
10	Exchangeable Calcium(asCa)	mg/Kg		160.5

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TEST REPORT

Test Report No.: KGS/0222/TR\S- 136

Client Name & Address		M/S.RAGAVENDRA MINERALS AND CHEMICALS , Mr.E.Dhanapal(Managing Partner) , No.D/364,1st Cross ,Ukkirakaliamman Koil Street, Anna Nagar , Thennur , Trichy ,Tamilnadu - 620017	
Site Location		S.F.No's 809/2 , 809/ 3 , 809 / 4, 809/5 (P) Extent 2.51.5 ha ,Thennilai Village, Kadavur Taluk, Karur District, Tamilnadu.	
Sample Code		S-02	
Sample Description	SOIL	Sample Reference	KGS/0222/S-136
Sample Mark	Core Zone	Sample Drawn by	Chemist
Sample Quantity	2.0 Kg	Sample Collected on	23.02.2022
Sample Received on	24.02.2022	Test Commenced on	24.02.2022
Test Completed on	28.02.2022	Test Reported on	28.02.2022

S. No	Parameters	Units	Test Methods	Result
11	Exchangeable Magnesium(asMg)	mg/Kg	Food and Agriculture Organization of the United Nations Rome, 2007	18.6
12	Exchangeable Manganese(asMn)	mg/Kg		31.1
13	Exchangeable Zinc as Zn	mg/Kg		0.31
14	Available Boron (as B)	mg/Kg		0.50
15	Soluble Chloride(as Cl)	mg/Kg		137.5
16	Soluble Sulphate(as SO ₄)	mg/Kg		136
17	Available Potassium(as K)	mg/Kg		37.1
18	Available Phosphorous(as P)	Kg/hect		1.11
19	Available Nitrogen(as N)	Kg/hect		184
20	Cadmium (as Cd)	mg/Kg		BDL (DL 0.003)

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TEST REPORT

Test Report No.: KGS/0222/TR\S- 136			
Client Name & Address		M/S.RAGAVENDRA MINERALS AND CHEMICALS , Mr.E.Dhanapal(Managing Partner) , No.D/364,1st Cross ,Ukkirakaliamman Koil Street, Anna Nagar , Thennur , Trichy ,Tamilnadu - 620017	
Site Location		S.F.No's 809/2 , 809/ 3 , 809 / 4, 809/5 (P) Extent 2.51.5 ha ,Thennilai Village, Kadavur Taluk, Karur District, Tamilnadu.	
Sample Code		S-02	
Sample Description	SOIL	Sample Reference	KGS/0222/S-136
Sample Mark	Core Zone	Sample Drawn by	Chemist
Sample Quantity	2.0 Kg	Sample Collected on	23.02.2022
Sample Received on	24.02.2022	Test Commenced on	24.02.2022
Test Completed on	28.02.2022	Test Reported on	28.02.2022

S. No	Parameters	Units	Test Methods	Result
21	Chromium (asCr)	mg/Kg	Food and Agriculture Organization of the United Nations Rome, 2007	BDL (DL:0.05)
22	Copper(asCu)	mg/Kg		BDL (DL:0.05)
23	Lead (asPb)	mg/Kg		0.55
24	Total Iron	mg/Kg		2.87
25	Organic Matter	%		1.96
26	Organic Carbon	%		1.14
27	CEC	meq/100g		44.7

.....End of Report.....




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KGS ENVIRO LABORATORY PVT LTD

NABL Accredited Testing Laboratory (ISO/IEC 17025:2017)



TEST REPORT

Test Report No.: KGS/0222/TR\S- 135

Client Name & Address		M/S.RAGAVENDRA MINERALS AND CHEMICALS , Mr.E.Dhanapal(Managing Partner) , No.D/364,1st Cross ,Ukkirakaliamman Koil Street, Anna Nagar , Thennur , Trichy ,Tamilnadu - 620017	
Site Location		S.F.No's 809/2 , 809/ 3 , 809 / 4, 809/5 (P) Extent 2.51.5 ha ,Thennilai Village, Kadavur Taluk, Karur District, Tamilnadu.	
Sample Code		SI	
Sample Description	SOIL	Sample Reference	KGS/0222/S-135
Sample Mark	Core Zone	Sample Drawn by	Chemist
Sample Quantity	2.0 Kg	Sample Collected on	23.02.2022
Sample Received on	24.02.2022	Test Commenced on	24.02.2022
Test Completed on	28.02.2022	Test Reported on	28.02.2022

S. No	Parameters	Units	Test Methods	Result
1	pl at 27°C	-	IS 2720 Part 26-1987(RA2011)	7.55
2	Electrical Conductivity at 25°C	µs/cm	IS 14767 : 2000 (RA 2010)	410
3	Texture	-	IS 2720 PART 2 (RA 2010)	Clay Loam
4	Sand	%	Food and Agriculture Organization of the United Nations Rome, 2007	35.5
5	Silt	%		37.4
6	Clay	%		27.1
7	Water Holding Capacity	%		45.8
8	Bulk Density	g/cc		1.16
9	Porosity	%		28.6
10	Exchangeable Calcium(asCa)	mg/Kg		174

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TEST REPORT

Test Report No.: KGS/0222/TR\S- 135			
Client Name & Address		M/S.RAGAVENDRA MINERALS AND CHEMICALS , Mr.E.Dhanapal(Managing Partner) , No.D/364,1st Cross ,Ukkirakaliamman Koil Street, Anna Nagar , Thennur , Trichy ,Tamilnadu - 620017	
Site Location		S.F.No's 809/2 , 809/ 3 , 809 / 4, 809/5 (P) Extent 2.51.5 ha ,Thennilai Village, Kadavur Taluk, Karur District, Tamilnadu.	
Sample Code		SI	
Sample Description	SOIL	Sample Reference	KGS/0222/S-135
Sample Mark	Core Zone	Sample Drawn by	Chemist
Sample Quantity	2.0 Kg	Sample Collected on	23.02.2022
Sample Received on	24.02.2022	Test Commenced on	24.02.2022
Test Completed on	28.02.2022	Test Reported on	28.02.2022

S. No	Parameters	Units	Test Methods	Result
11	Exchangeable Magnesium(asMg)	mg/Kg	Food and Agriculture Organization of the United Nations Rome, 2007	20.6
12	Exchangeable Manganese(asMn)	mg/Kg		32.4
13	Exchangeable Zinc as Zn	mg/Kg		0.51
14	Available Boron (as B)	mg/Kg		0.50
15	Soluble Chloride(as Cl)	mg/Kg		140
16	Soluble Sulphate(as SO ₄)	mg/Kg		133
17	Available Potassium(as K)	mg/Kg		37.5
18	Available Phosphorous(as P)	Kg/hect		0.92
19	Available Nitrogen(as N)	Kg/hect		135
20	Cadmium (as Cd)	mg/Kg		BDL(DDL:0.003)

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KGS ENVIRO LABORATORY PVT LTD

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TEST REPORT

Test Report No.: KGS/0222/TR\S- 135			
Client Name & Address		M/S.RAGAVENDRA MINERALS AND CHEMICALS , Mr.E.Dhanapal(Managing Partner) , No.D/364,1st Cross ,Ukkirakaliamman Koil Street, Anna Nagar , Thennur , Trichy ,Tamilnadu - 620017	
Site Location		S.F.No's 809/2 , 809/ 3 , 809 / 4, 809/5 (P) Extent 2.51.5 ha ,Thennilai Village, Kadavur Taluk, Karur District, Tamilnadu.	
Sample Code		S1	
Sample Description	SOIL	Sample Reference	KGS/0222/S-135
Sample Mark	Core Zone	Sample Drawn by	Chemist
Sample Quantity	2.0 Kg	Sample Collected on	23.02.2022
Sample Received on	24.02.2022	Test Commenced on	24.02.2022
Test Completed on	28.02.2022	Test Reported on	28.02.2022

S. No	Parameters	Units	Test Methods	Result
21	Chromium (asCr)	mg/Kg	Food and Agriculture Organization of the United Nations Rome, 2007	BDL (DL:0.05)
22	Copper(asCu)	mg/Kg		BDL (DL:0.05)
23	Lead (asPb)	mg/Kg		0.75
24	Total Iron	mg/Kg		2.13
25	Organic Matter	%		1.36
26	Organic Carbon	%		0.79
27	CEC	meq/100g		40.8

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KGS ENVIRO LABORATORY PVT LTD

NABL Accredited Testing Laboratory (ISO/IEC 17025:2017)



TEST REPORT

Test Report No:KGS/0222/TR/N-134		Report Date :28.02.2022	
Client Name & Address		M/S.RAGAVENDRA MINERALS AND CHEMICALS, Mr.E.Dhanapal(Managing Partner) , No.D/364,1st Cross ,Ukkirakaliamman Koil Street, Anna Nagar , Thennur , Trichy ,Tamilnadu - 620017	
Site Location:		S.F.No's 809/2 , 809/ 3 , 809 / 4, 809/5 (P) Extent 2.51.5 ha ,Thennilai Village, Kadavur Taluk, Karur District, Tamilnadu.	
Discipline	Chemical	Sample Reference ID	KGS/0222/N-134
Group	Atmospheric Pollution	Noise Level Monitored By	Chemist
Sample Matrix	Noise	Noise Level Monitored On	23.02.2022
Sample Description	Ambient Noise	Noise Level Received On	23.02.2022
General Sampling Procedure	IS 9989 Methods	Noise Level Calculated On	28.02.2022

Location		N4 - Mamarathupatti			N5 - Budwadi			N6 - Chinnatampatti		
S.No	Time (Hrs)	Min dB(A)	Max dB(A)	Leq dB(A)	Min dB(A)	Max dB(A)	Leq dB(A)	Min dB(A)	Max dB(A)	Leq dB(A)
1.	0600	34.5	38.6	37.0	32.6	38.8	36.7	31.5	38.1	35.9
2.	0700	35.6	38.6	37.4	34.9	37.6	36.5	32.6	40.7	38.3
3.	0800	34.2	40.5	38.4	32.6	34.5	33.7	33.9	41.4	39.1
4.	0900	35.5	41.5	39.5	33.6	36.8	35.5	31.4	39.5	37.1
5.	1000	31.5	41.5	38.9	32.8	40.2	37.9	32.5	40.2	37.9
6.	1100	32.2	35.5	34.2	31.2	41.5	38.9	33.8	41.4	39.1
7.	1200	34.5	38.5	36.9	36.4	43.5	41.3	35.6	43.6	41.2
8.	1300	33.9	38.1	36.5	33.9	41.4	39.1	31.8	38.4	36.2
9.	1400	31.4	32.2	31.8	32.7	43.9	41.2	33.9	41.7	39.4
10.	1500	36.8	40.2	38.8	36.5	42.2	40.2	32.5	40.9	38.5
11.	1600	35.7	40.4	38.7	32.3	40.9	38.5	34.8	43.6	41.1
12.	1700	32.3	38.2	36.2	34.2	43.2	40.7	32.6	40.4	38.1
13.	1800	33.4	40.5	38.3	34.7	44.9	42.3	35.1	43.1	40.7
14.	1900	31.9	42.2	39.6	31.6	40.7	38.2	36.1	40.2	38.6
15.	2000	35.7	40.3	38.6	32.8	40.3	38.0	34.2	43.6	41.1

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KGS ENVIRO LABORATORY PVT LTD

NABL Accredited Testing Laboratory (ISO/IEC 17025:2017)



TEST REPORT

Test Report No:KGS/0222/TR/N-134		Report Date :28.02.2022	
Client Name & Address		M/S.RAGAVENDRA MINERALS AND CHEMICALS , Mr.E.Dhanapal(Managing Partner) , No.D/364,1st Cross ,Ukkirakaliamman Koil Street, Anna Nagar , Thennur , Trichy ,Tamilnadu - 620017	
Site Location:		S.F.No's 809/2 , 809/ 3 , 809 / 4, 809/5 (P) Extent 2.51.5 ha ,Thennilai Village, Kadavur Taluk, Karur District, Tamilnadu.	
Discipline	Chemical	Sample Reference ID	KGS/0222/N-134
Group	Atmospheric Pollution	Noise Level Monitored By	Chemist
Sample Matrix	Noise	Noise Level Monitored On	23.02.2022
Sample Description	Ambient Noise	Noise Level Received On	23.02.2022
General Sampling Procedure	IS 9989 Methods	Noise Level Calculated On	28.02.2022

Location		N4 - Mamarathupatti			N5 - Budwadi			N6 - Chinnatampatti				
S.No	Time (Hrs)	Min dB(A)	Max dB(A)	Leq dB(A)	Min dB(A)	Max dB(A)	Leq dB(A)	Min dB(A)	Max dB(A)	Leq dB(A)		
16.	2100	33.4	42.5	40.0	33.6	41.4	39.1	36.5	47.1	44.5		
17.	2200	38.4	40.2	39.4	32.5	40.3	38.0	33.8	41.2	38.9		
18.	2300	32.9	37.8	36.0	36.4	45.2	42.7	33.9	42.1	39.7		
19.	0000	34.6	39.8	37.9	33.6	35	34.4	31.5	39.4	37.0		
20.	0100	35.5	36.7	36.1	34.9	35.8	35.4	32.9	40.2	37.9		
21.	0200	31.5	35.6	34.0	31.5	34.2	33.1	33.4	41.7	39.3		
22.	0300	32.2	35.8	34.4	32.3	35.5	34.2	31.7	38.5	36.3		
23.	0400	35.5	36.8	36.2	31.7	34.8	33.5	32.6	40.8	38.4		
24.	0500	34.5	35.5	35.0	32.2	34.5	33.5	31.3	38.6	36.3		
Day Mean dB(A)				37.6	Day Mean dB(A)			38.6	Day Mean dB(A)			39.2
Night Mean dB(A)				35.7	Night Mean dB(A)			35.2	Night Mean dB(A)			37.9

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KGS ENVIRO LABORATORY PVT LTD

NABL Accredited Testing Laboratory (ISO/IEC 17025:2017)



TEST REPORT

Test Report No:KGS/0222/TR/N-133		Report Date :28.02.2022	
Client Name & Address		M/S.RAGAVENDRA MINERALS AND CHEMICALS , Mr.E.Dhanapal(Managing Partner) , No.D/364,1st Cross ,Ukkirakaliamman Koil Street, Anna Nagar , Thennur , Trichy ,Tamilnadu - 620017	
Site Location:		S.F.No's 809/2 , 809/ 3 , 809 / 4, 809/5 (P) Extent 2.51.5 ha ,Thennilai Village, Kadavur Taluk, Karur District, Tamilnadu.	
Discipline	Chemical	Sample Reference ID	KGS/0222/N-133
Group	Atmospheric Pollution	Noise Level Monitored By	Chemist
Sample Matrix	Noise	Noise Level Monitored On	23.02.2022
Sample Description	Ambient Noise	Noise Level Received On	23.02.2022
General Sampling Procedure	IS 9989 Methods	Noise Level Calculated On	28.02.2022

Location		N1 - Core Zone			N2 - Core Zone			N3 - Thalambakoundanur		
S.No	Time (Hrs)	Min dB(A)	Max dB(A)	Leq dB(A)	Min dB(A)	Max dB(A)	Leq dB(A)	Min dB(A)	Max dB(A)	Leq dB(A)
1.	0600	32.8	40.3	38.0	31.6	39.3	37.0	37.9	41.6	40.1
2.	0700	33.6	41.4	39.1	34.2	43.2	40.7	38.9	42.8	41.3
3.	0800	31.4	42.2	39.5	33.8	41.4	39.1	39.6	42.6	41.4
4.	0900	32.9	40.7	38.4	31.6	39.7	37.3	38.9	45.5	43.3
5.	1000	33.6	41.6	39.2	32.5	40.4	38.0	38.5	47.3	44.8
6.	1100	32.5	40.7	38.3	33.7	41.3	39.0	38.1	48.7	46.1
7.	1200	32.7	40.2	37.9	33.6	41.7	39.3	37.6	43.1	41.2
8.	1300	33.8	41.6	39.3	32.4	40.5	38.1	37.6	39.2	38.5
9.	1400	35.1	44.3	41.8	31.9	39.6	37.3	37.2	45.2	42.8
10.	1500	33.9	42.2	39.8	32.6	40.1	37.8	38.5	49.5	46.8
11.	1600	34.6	43.7	41.2	34.5	43.3	40.8	39.2	46.3	44.1
12.	1700	35.8	44.8	42.3	36.2	45.6	43.1	41.6	41.7	41.7
13.	1800	34.2	42.3	39.9	35.3	44.7	42.2	41.8	39.1	40.7
14.	1900	36.8	44.5	42.2	34.7	43.6	41.1	42.5	40.7	41.7
15.	2000	31.9	38.2	36.1	33.8	41.4	39.1	33.7	41.3	39.0

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TEST REPORT

Test Report No:KGS/0222/TR/N-133		Report Date :28.02.2022	
Client Name & Address		M/S.RAGAVENDRA MINERALS AND CHEMICALS , Mr.E.Dhanapal(Managing Partner) , No.D/364,1st Cross ,Ukkirakaliamman Koil Street, Anna Nagar , Thennur , Trichy ,Tamilnadu - 620017	
Site Location:		S.F.No's 809/2 , 809/ 3 , 809 / 4, 809/5 (P) Extent 2.51.5 ha ,Thennilai Village, Kadavur Taluk, Karur District, Tamilnadu.	
Discipline	Chemical	Sample Reference ID	KGS/0222/N-133
Group	Atmospheric Pollution	Noise Level Monitored By	Chemist
Sample Matrix	Noise	Noise Level Monitored On	23.02.2022
Sample Description	Ambient Noise	Noise Level Received On	23.02.2022
General Sampling Procedure	IS 9989 Methods	Noise Level Calculated On	28.02.2022

Location		N1 - Core Zone			N2 - Core Zone			N3 - Thalambakoundanur				
S.No	Time (Hrs)	Min dB(A)	Max dB(A)	Leq dB(A)	Min dB(A)	Max dB(A)	Leq dB(A)	Min dB(A)	Max dB(A)	Leq dB(A)		
16.	2100	32.4	40.1	37.8	31.2	39.5	37.1	38.2	44.7	42.6		
17.	2200	33.6	35.8	34.8	32.3	40.7	38.3	34.4	36.2	35.4		
18.	2300	32.5	36.7	35.1	32.6	37.4	35.6	34.6	36.1	35.4		
19.	0000	31.4	38.1	35.9	32.4	39.6	37.3	35.8	37.8	36.9		
20.	0100	33.6	35.5	34.7	32.8	38.1	36.2	36.2	39.9	38.4		
21.	0200	32.8	36.6	35.1	31.5	38.4	36.2	35.6	39.4	37.9		
22.	0300	31.4	34.6	33.3	32.6	39.4	37.2	34.8	38.5	37.0		
23.	0400	33.6	35.5	34.7	32.1	34.8	33.7	35.5	36.9	36.3		
24.	0500	32.7	34.5	33.7	33.7	35.5	34.7	36.4	38.4	37.5		
Day Mean dB(A)				39.1	Day Mean dB(A)			39.1	Day Mean dB(A)			41.8
Night Mean dB(A)				34.6	Night Mean dB(A)			35.9	Night Mean dB(A)			37.1

.....End of Report.....



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KGS ENVIRO LABORATORY PVT LTD

NABL Accredited Testing Laboratory (ISO/IEC 17025:2017)



TEST REPORT

Test Report No: KGS/0222/TR/N-132		Report Date :28.02.2022	
Client Name & Address		M/S.RAGAVENDRA MINERALS AND CHEMICALS , Mr.E.Dhanapal(Managing Partner) , No.D/364, 1st Cross , Ukkirakaliamman Koil Street, Anna Nagar , Thennur , Trichy ,Tamilnadu - 620017	
Site Location:		S.F.Nos. 809/2 , 809/ 3 , 809 / 4, 809/5 (P) Extent 2.51.5 ha, Thennilai Village, Kadavur Taluk, Karur District, Tamilnadu.	
Discipline	Chemical	Sample Reference ID	KGS/0222/N-132
Group	Atmospheric Pollution	Noise Level Monitored By	Chemist
Sample Matrix	Noise	Noise Level Monitored On	23.02.2022
Sample Description	Ambient Noise	Noise Level Received On	23.02.2022
General Sampling Procedure	IS 9989 Methods	Noise Level Calculated On	28.02.2022

Location		N7 - Mathagiri			N8 - Mylampatti		
S.No	Time (Hrs)	Min dB(A)	Max dB(A)	Leq dB(A)	Min dB(A)	Max dB(A)	Leq dB(A)
1.	0600	36.8	40.2	38.8	31.9	38.4	36.3
2.	0700	35.9	41.6	39.6	33.5	31.6	32.7
3.	0800	37.5	43.2	41.2	31.6	38.4	36.2
4.	0900	36.2	42.7	40.6	32.7	41.2	38.8
5.	1000	38.6	42.6	41.0	34.9	43.4	41.0
6.	1100	37.4	42.9	41.0	36.2	45.7	43.2
7.	1200	34.6	39.4	37.6	34.1	43.9	41.3
8.	1300	38.1	46.5	44.1	32.9	40.4	38.1
9.	1400	35.5	40.3	38.5	38.4	46.1	43.8
10.	1500	36.9	43.7	41.5	34.6	43.3	40.8
11.	1600	36.6	41.7	39.9	32.9	40.8	38.4
12.	1700	36.2	43.5	41.2	34.1	43.4	40.9
13.	1800	37.5	44.9	42.6	33.6	41.6	39.2
14.	1900	35.5	42.6	40.4	32.8	40.8	38.4
15.	2000	33.2	35.5	34.5	34.1	43.4	40.9

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KGS ENVIRO LABORATORY PVT LTD

NABL Accredited Testing Laboratory (ISO/IEC 17025:2017)



TEST REPORT

Test Report No: KGS/0222/TR/N-132		Report Date :28.02.2022	
Client Name & Address		M/S.RAGAVENDRA MINERALS AND CHEMICALS , Mr.E.Dhanapal(Managing Partner) , No.D/364, 1st Cross , Ukkirakaliamman Koil Street, Anna Nagar , Thennur , Trichy ,Tamilnadu - 620017	
Site Location:		S.F.Nos. 809/2 , 809/ 3 , 809 / 4, 809/5 (P) Extent 2.51.5 ha, Thennilai Village, Kadavur Taluk, Karur District, Tamilnadu.	
Discipline	Chemical	Sample Reference ID	KGS/0222/N-132
Group	Atmospheric Pollution	Noise Level Monitored By	Chemist
Sample Matrix	Noise	Noise Level Monitored On	23.02.2022
Sample Description	Ambient Noise	Noise Level Received On	23.02.2022
General Sampling Procedure	IS 9989 Methods	Noise Level Calculated On	28.02.2022

Location		N7 - Mathagiri			N8 - Mylampatti		
S.No	Time (Hrs)	Min dB(A)	Max dB(A)	Leq dB(A)	Min dB(A)	Max dB(A)	Leq dB(A)
16.	2100	35.9	37.8	37.0	36.9	45.5	43.1
17.	2200	36.8	38.6	37.8	32.7	41.9	39.4
18.	2300	35.1	36.5	35.9	34.2	39.7	37.8
19.	0000	38.2	39.9	39.1	32.6	35.1	34.0
20.	0100	37.5	38.2	37.9	31.3	35.5	33.9
21.	0200	33.8	35.5	34.7	32.3	38.7	36.6
22.	0300	36.5	37.2	36.9	33.4	36.9	35.5
23.	0400	36.9	37.1	37.0	31.2	36.7	34.8
24.	0500	35.7	36.9	36.3	32.6	35.8	34.5
Day Mean dB(A)				39.8	Day Mean dB(A)		39.5
Night Mean dB(A)				36.8	Night Mean dB(A)		35.3

.....End of Report.....




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KGS ENVIRO LABORATORY PVT LTD

NABL Accredited Testing Laboratory (ISO/IEC 17025:2017)



TEST REPORT

Test Report No: KGS/0222/TR/A-131			
Client Name & Address		M/S.RAGAVENDRA MINERALS AND CHEMICALS , Mr.E.Dhanapal(Managing Partner), No.D/364, 1st Cross, Ukkirakaliamman Koil Street, Anna Nagar, Thennur, Trichy, Tamilnadu - 620017	
Site Location		S.F.No's 809/2 , 809/ 3 , 809 / 4, 809/5 (P) Extent 2.51.5 ha, Thennilai Village, Kadavur Taluk, Karur District, Tamilnadu.	
Discipline	Chemical	General Sampling Procedure	IS 5182 Part 5&Part14
Group	Atmospheric Pollution	Sample Reference Id	KGS/0222/A-131
Sample Matrix	AAQ	Sample Collected By	Chemist
Sample Description	Ambient Air Quality	Sample Collected On	December 2021 –February 2022
Sample Mark	AAQ	Sampling Time	24 Hours
Sample Received Condition	Good/PVC Container	Sample Code / Location	AAQ 8 – Mylampatti

Monitoring Date	Particulates		Gaseous Pollutants					Other Pollutants (Particulate Phase)				
	PM ₁₀ , µg/m ³	PM _{2.5} , µg/m ³	SO ₂ , µg/m ³	NO ₂ , µg/m ³	NH ₃ , µg/m ³	O ₃ , µg/m ³	CO mg/m ³	Pb, µg/m ³	As, ng/m ³	Ni, ng/m ³	C ₆ H ₆ , µg/m ³	BaP, ng/m ³
NAAQ Norms*	100 (24 hrs.)	60 (24 hrs.)	80 (24 hrs.)	80 (24 hrs.)	400 (24 hrs.)	100 (8 hrs.)	2.0 (8hrs.)	1.0 (24 hrs.)	6.0 (annual)	20 (annual)	5.0 (annual)	1.0 (annual)
01.12.2021	38.7	19.9	6.2	26.2	<5.0	<5.0	<1.0	<0.01	<5.0	<3.0	<1.0	<3.0
02.12.2021	38.6	21.3	6.1	26.3	<5.0	<5.0	<1.0	<0.01	<5.0	<3.0	<1.0	<3.0
08.12.2021	37.8	21.4	6.3	25.7	<5.0	<5.0	<1.0	<0.01	<5.0	<3.0	<1.0	<3.0
09.12.2021	35.3	22.6	7.6	25.9	<5.0	<5.0	<1.0	<0.01	<5.0	<3.0	<1.0	<3.0
15.12.2021	36.7	22.5	7.8	26.3	<5.0	<5.0	<1.0	<0.01	<5.0	<3.0	<1.0	<3.0
16.12.2021	35.9	20.3	6.4	26.3	<5.0	<5.0	<1.0	<0.01	<5.0	<3.0	<1.0	<3.0
22.12.2021	35.6	20.7	6.3	25.7	<5.0	<5.0	<1.0	<0.01	<5.0	<3.0	<1.0	<3.0
23.12.2021	34.3	22.9	5.6	25.8	<5.0	<5.0	<1.0	<0.01	<5.0	<3.0	<1.0	<3.0
29.12.2021	35.4	22.6	6.8	26.2	<5.0	<5.0	<1.0	<0.01	<5.0	<3.0	<1.0	<3.0
30.12.2021	35.6	21.1	6.6	25.9	<5.0	<5.0	<1.0	<0.01	<5.0	<3.0	<1.0	<3.0
05.01.2022	35.7	20.3	5.7	25.3	<5.0	<5.0	<1.0	<0.01	<5.0	<3.0	<1.0	<3.0
06.01.2022	36.9	21.8	6.5	24.9	<5.0	<5.0	<1.0	<0.01	<5.0	<3.0	<1.0	<3.0
12.01.2022	35.6	21.7	5.2	24.4	<5.0	<5.0	<1.0	<0.01	<5.0	<3.0	<1.0	<3.0
13.01.2022	37.1	21.6	6.6	23.4	<5.0	<5.0	<1.0	<0.01	<5.0	<3.0	<1.0	<3.0

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KGS ENVIRO LABORATORY PVT LTD

NABL Accredited Testing Laboratory (ISO/IEC 17025:2017)



TEST REPORT

Test Report No: KGS/0222/TR/A-131		M/S.RAGAVENDRA MINERALS AND CHEMICALS, Mr.E.Dhanapal(Managing Partner), No.D/364, 1st Cross, Ukkirakaliamman Koil Street, Anna Nagar, Thennur, Trichy, Tamilnadu - 620017	
Client Name & Address		S.F.No's 809/2 , 809/3 , 809 / 4, 809/5 (P) Extent 2.51.5 ha, Thennilai Village, Kadavur Taluk, Karur District, Tamilnadu.	
Site Location		General Sampling Procedure	IS 5182 Part 5&Part14
Discipline	Chemical	Sample Reference Id	KGS/0222/A-131
Group	Atmospheric Pollution	Sample Collected By	Chemist
Sample Matrix	AAQ	Sample Collected On	December 2021 –February 2022
Sample Description	Ambient Air Quality	Sampling Time	24 Hours
Sample Mark	AAQ	Sample Code / Location	AAQ 8 – Mylampatti
Sample Received Condition	Good/PVC Container		

Monitoring Date	Particulates		Gaseous Pollutants					Other Pollutants (Particulate Phase)				
	PM ₁₀ , µg/m ³	PM _{2.5} , µg/m ³	SO ₂ , µg/m ³	NO ₂ , µg/m ³	NH ₃ , µg/m ³	O ₃ , µg/m ³	CO mg/m ³	Pb, µg/m ³	As, ng/m ³	Ni, ng/m ³	C ₆ H ₆ , µg/m ³	BaP, ng/m ³
NAAQ Norms*	100 (24 hrs.)	60 (24 hrs.)	80 (24 hrs.)	80 (24 hrs.)	400 (24 hrs.)	100 (8 hrs.)	2.0 (8hrs.)	1.0 (24 hrs.)	6.0 (annual)	20 (annual)	5.0 (annual)	1.0 (annual)
19.01.2022	35.5	20.4	6.6	22.3	<5.0	<5.0	<1.0	<0.01	<5.0	<3.0	<1.0	<3.0
20.01.2022	35.8	20.1	5.7	24.3	<5.0	<5.0	<1.0	<0.01	<5.0	<3.0	<1.0	<3.0
26.01.2022	36.5	21.8	5.1	24.9	<5.0	<5.0	<1.0	<0.01	<5.0	<3.0	<1.0	<3.0
27.01.2022	43.3	21.5	5.3	25.4	<5.0	<5.0	<1.0	<0.01	<5.0	<3.0	<1.0	<3.0
02.02.2022	41.1	21.7	5.4	24.3	<5.0	<5.0	<1.0	<0.01	<5.0	<3.0	<1.0	<3.0
03.02.2022	40.9	22.3	5.5	24.7	<5.0	<5.0	<1.0	<0.01	<5.0	<3.0	<1.0	<3.0
09.02.2022	41.3	21.6	5.9	24.2	<5.0	<5.0	<1.0	<0.01	<5.0	<3.0	<1.0	<3.0
10.02.2022	41.1	22.7	5.2	24.9	<5.0	<5.0	<1.0	<0.01	<5.0	<3.0	<1.0	<3.0
16.02.2022	42.8	21.3	5.6	26.3	<5.0	<5.0	<1.0	<0.01	<5.0	<3.0	<1.0	<3.0
17.02.2022	41.5	21.4	6.2	26.7	<5.0	<5.0	<1.0	<0.01	<5.0	<3.0	<1.0	<3.0
23.02.2022	42.6	21.6	6.5	25.3	<5.0	<5.0	<1.0	<0.01	<5.0	<3.0	<1.0	<3.0
24.02.2022	42.1	22.7	6.6	25.1	<5.0	<5.0	<1.0	<0.01	<5.0	<3.0	<1.0	<3.0

* NAAQS–National Ambient Air Quality Standards Issued by CPCB (Central Pollution Control Board) in 2009.

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KGS ENVIRO LABORATORY PVT LTD

NABL Accredited Testing Laboratory (ISO/IEC 17025:2017)



TEST REPORT

Test Report No: KGS/0222/TR/A-130		M/S.RAGAVENDRA MINERALS AND CHEMICALS, Mr.E.Dhanapal(Managing Partner), No.D/364, 1st Cross, Ukkirakaliamman Koil Street, Anna Nagar, Thennur, Trichy, Tamilnadu - 620017	
Client Name & Address		S.F.No's 809/2, 809/ 3, 809 / 4, 809/5 (P) Extent 2.51.5 ha, Thennilai Village, Kadavur Taluk, Karur District, Tamilnadu.	
Site Location		General Sampling Procedure	IS 5182 Part 5&Part 14
Discipline	Chemical	Sample Reference Id	KGS/0222/A-130
Group	Atmospheric Pollution	Sample Collected By	Chemist
Sample Matrix	AAQ	Sample Collected On	December 2021 -February 2022
Sample Description	Ambient Air Quality	Sampling Time	24 Hours
Sample Mark	AAQ	Sample Code /Location	AAQ7- Mathagiri
Sample Received Condition	Good/PVC Container		

Monitoring Date	Particulates		Gaseous Pollutants					Other Pollutants (Particulate Phase)				
	PM ₁₀ , µg/m ³	PM _{2.5} , µg/m ³	SO ₂ , µg/m ³	NO ₂ , µg/m ³	NH ₃ , µg/m ³	O ₃ , µg/m ³	CO, mg/m ³	Pb, µg/m ³	As, ng/m ³	Ni, ng/m ³	C ₆ H ₆ , µg/m ³	BaP, ng/m ³
NAAQ Norms*	100 (24 hrs.)	60 (24 hrs.)	80 (24 hrs.)	80 (24 hrs.)	400 (24 hrs.)	100 (8 hrs.)	2.0 (8hrs.)	1.0 (24 hrs.)	6.0 (annual)	20 (annual)	5.0 (annual)	1.0 (annual)
01.12.2021	38.2	19.6	7.6	20.3	<5.0	<5.0	<1.0	<0.01	<5.0	<3.0	<1.0	<3.0
02.12.2021	38.6	19.5	7.6	20.5	<5.0	<5.0	<1.0	<0.01	<5.0	<3.0	<1.0	<3.0
08.12.2021	39.2	19.3	7.2	21.6	<5.0	<5.0	<1.0	<0.01	<5.0	<3.0	<1.0	<3.0
09.12.2021	39.1	19.4	6.2	21.7	<5.0	<5.0	<1.0	<0.01	<5.0	<3.0	<1.0	<3.0
15.12.2021	35.6	19.8	6.5	21.6	<5.0	<5.0	<1.0	<0.01	<5.0	<3.0	<1.0	<3.0
16.12.2021	35.3	19.6	6.9	21.8	<5.0	<5.0	<1.0	<0.01	<5.0	<3.0	<1.0	<3.0
22.12.2021	36.2	19.5	6.7	21.6	<5.0	<5.0	<1.0	<0.01	<5.0	<3.0	<1.0	<3.0
23.12.2021	36.2	20.9	6.8	22.5	<5.0	<5.0	<1.0	<0.01	<5.0	<3.0	<1.0	<3.0
29.12.2021	38.2	19.4	6.2	22.6	<5.0	<5.0	<1.0	<0.01	<5.0	<3.0	<1.0	<3.0
30.12.2021	38.8	18.2	6.2	22.4	<5.0	<5.0	<1.0	<0.01	<5.0	<3.0	<1.0	<3.0
05.01.2022	35.4	18.6	6.3	22.7	<5.0	<5.0	<1.0	<0.01	<5.0	<3.0	<1.0	<3.0
06.01.2022	38.2	18.2	7.4	24.6	<5.0	<5.0	<1.0	<0.01	<5.0	<3.0	<1.0	<3.0
12.01.2022	38.1	18.2	5.5	24.5	<5.0	<5.0	<1.0	<0.01	<5.0	<3.0	<1.0	<3.0
13.01.2022	37.2	17.8	5.7	24.3	<5.0	<5.0	<1.0	<0.01	<5.0	<3.0	<1.0	<3.0

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KGS ENVIRO LABORATORY PVT LTD

NABL Accredited Testing Laboratory (ISO/IEC 17025:2017)



TEST REPORT

Test Report No: KGS/0222/TR/A-130		M/S.RAGAVENDRA MINERALS AND CHEMICALS, Mr.E.Dhanapal(Managing Partner), No.D/364, 1st Cross, Ukkirakaliamman Koil Street, Anna Nagar, Thennur, Trichy, Tamilnadu - 620017	
Client Name & Address		S.F.No's 809/2, 809/ 3, 809 / 4, 809/5 (P) Extent 2.51.5 ha, Thennilai Village, Kadavur Taluk, Karur District, Tamilnadu.	
Site Location		General Sampling Procedure	IS 5182 Part 5&Part 14
Discipline	Chemical	Sample Reference Id	KGS/0222/A-130
Group	Atmospheric Pollution	Sample Collected By	Chemist
Sample Matrix	AAQ	Sample Collected On	December 2021 –February 2022
Sample Description	Ambient Air Quality	Sampling Time	24 Hours
Sample Mark	AAQ	Sample Code /Location	AAQ7- Mathagiri
Sample Received Condition	Good/PVC Container		

Monitoring Date	Particulates		Gaseous Pollutants					Other Pollutants (Particulate Phase)				
	PM ₁₀ , µg/m ³	PM _{2.5} , µg/m ³	SO ₂ , µg/m ³	NO ₂ , µg/m ³	NH ₃ , µg/m ³	O ₃ , µg/m ³	CO mg/m ³	Pb, µg/m ³	As, ng/m ³	Ni, ng/m ³	C ₆ H ₆ , µg/m ³	BaP, ng/m ³
NAAQ Norms*	100 (24 hrs.)	60 (24 hrs.)	80 (24 hrs.)	80 (24 hrs.)	400 (24 hrs.)	100 (8 hrs.)	2.0 (8hrs.)	1.0 (24 hrs.)	6.0 (annual)	20 (annual)	5.0 (annual)	1.0 (annual)
19.01.2022	37.6	17.7	4.6	24.1	<5.0	<5.0	<1.0	<0.01	<5.0	<3.0	<1.0	<3.0
20.01.2022	34.8	18.8	4.9	23.2	<5.0	<5.0	<1.0	<0.01	<5.0	<3.0	<1.0	<3.0
26.01.2022	35.2	17.6	4.2	23.5	<5.0	<5.0	<1.0	<0.01	<5.0	<3.0	<1.0	<3.0
27.01.2022	35.8	17.2	7.6	23.1	<5.0	<5.0	<1.0	<0.01	<5.0	<3.0	<1.0	<3.0
02.02.2022	35.4	17.5	7.9	26.2	<5.0	<5.0	<1.0	<0.01	<5.0	<3.0	<1.0	<3.0
03.02.2022	36.3	17.8	8.2	26.1	<5.0	<5.0	<1.0	<0.01	<5.0	<3.0	<1.0	<3.0
09.02.2022	36.2	18.3	8.6	26.4	<5.0	<5.0	<1.0	<0.01	<5.0	<3.0	<1.0	<3.0
10.02.2022	36.1	18.6	8.1	25.2	<5.0	<5.0	<1.0	<0.01	<5.0	<3.0	<1.0	<3.0
16.02.2022	37.1	18.2	8.6	24.1	<5.0	<5.0	<1.0	<0.01	<5.0	<3.0	<1.0	<3.0
17.02.2022	38.5	18.5	8.2	25.9	<5.0	<5.0	<1.0	<0.01	<5.0	<3.0	<1.0	<3.0
23.02.2022	37.6	18.1	6.3	23.1	<5.0	<5.0	<1.0	<0.01	<5.0	<3.0	<1.0	<3.0
24.02.2022	38.5	18.7	6.8	24.4	<5.0	<5.0	<1.0	<0.01	<5.0	<3.0	<1.0	<3.0

* NAAQS-National Ambient Air Quality Standards Issued by CPCB (Central Pollution Control Board) in 2009.

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KGS ENVIRO LABORATORY PVT LTD

NABL Accredited Testing Laboratory (ISO/IEC 17025:2017)



TEST REPORT

Test Report No: KGS/0222/TR/A-129

Client Name & Address		M/S.RAGAVENDRA MINERALS AND CHEMICALS , Mr.E.Dhanapal(Managing Partner) , No.D/364,1st Cross ,Ukkirakaliamman Koil Street, Anna Nagar , Thennur , Trichy ,Tamilnadu - 620017	
Site Location		S.F.Nos. 809/2, 809/3, 809/4, 809/5 (P) Extent 2.51.5 ha, Thennilai Village, Kadavur aluk, Karur District, Tamilnadu.	
Discipline	Chemical	General Sampling Procedure	IS 5182 Part 5&Part14
Group	Atmospheric Pollution	Sample Reference Id	KGS/0222/A-129
Sample Matrix	AAQ	Sample Collected By	Chemist
Sample Description	Ambient Air Quality	Sample Collected On	December 2021 –February 2022
Sample Mark	AAQ	Sampling Time	24 Hours
Sample Received Condition	Good/PVC Container	Sample Code /Location	AAQ6 -Chinnatampatti

Monitoring Date	Particulates		Gaseous Pollutants					Other Pollutants (Particulate Phase)				
	PM ₁₀ , µg/m ³	PM _{2.5} , µg/m ³	SO ₂ , µg/m ³	NO ₂ , µg/m ³	NH ₃ , µg/m ³	O ₃ , µg/m ³	CO mg/m ³	Pb, µg/m ³	As, ng/m ³	Ni, ng/m ³	C ₆ H ₆ , µg/m ³	BaP, ng/m ³
NAAQ Norms*	100 (24 hrs.)	60 (24 hrs.)	80 (24 hrs.)	80 (24 hrs.)	400 (24 hrs.)	100 (8 hrs.)	2.0 (8hrs.)	1.0 (24 hrs.)	6.0 (annual)	20 (annual)	5.0 (annual)	1.0 (annual)
01.12.2021	19.8	39.5	6.9	21.1	<5.0	<5.0	<1.0	<0.01	<5.0	<3.0	<1.0	<3.0
02.12.2021	19.6	39.4	6.8	21.0	<5.0	<5.0	<1.0	<0.01	<5.0	<3.0	<1.0	<3.0
08.12.2021	18.2	39.1	6.6	21.0	<5.0	<5.0	<1.0	<0.01	<5.0	<3.0	<1.0	<3.0
09.12.2021	19.5	38.5	6.9	20.3	<5.0	<5.0	<1.0	<0.01	<5.0	<3.0	<1.0	<3.0
15.12.2021	19.4	38.2	6.4	20.7	<5.0	<5.0	<1.0	<0.01	<5.0	<3.0	<1.0	<3.0
16.12.2021	19.1	36.9	6.6	20.5	<5.0	<5.0	<1.0	<0.01	<5.0	<3.0	<1.0	<3.0
22.12.2021	18.2	36.4	6.8	21.4	<5.0	<5.0	<1.0	<0.01	<5.0	<3.0	<1.0	<3.0
23.12.2021	18.7	35.8	6.5	21.3	<5.0	<5.0	<1.0	<0.01	<5.0	<3.0	<1.0	<3.0
29.12.2021	19.6	36.9	6.1	21.9	<5.0	<5.0	<1.0	<0.01	<5.0	<3.0	<1.0	<3.0
30.12.2021	18.9	36.8	6.7	21.7	<5.0	<5.0	<1.0	<0.01	<5.0	<3.0	<1.0	<3.0
05.01.2022	20.1	38.1	6.5	21.4	<5.0	<5.0	<1.0	<0.01	<5.0	<3.0	<1.0	<3.0
06.01.2022	19.6	38.5	6.8	20.3	<5.0	<5.0	<1.0	<0.01	<5.0	<3.0	<1.0	<3.0
12.01.2022	18.2	38.0	6.4	20.3	<5.0	<5.0	<1.0	<0.01	<5.0	<3.0	<1.0	<3.0
13.01.2022	19.7	36.9	6.8	20.9	<5.0	<5.0	<1.0	<0.01	<5.0	<3.0	<1.0	<3.0
01.12.2021	19.8	39.5	6.9	21.1	<5.0	<5.0	<1.0	<0.01	<5.0	<3.0	<1.0	<3.0
02.12.2021	19.6	39.4	6.8	21.0	<5.0	<5.0	<1.0	<0.01	<5.0	<3.0	<1.0	<3.0

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KGS ENVIRO LABORATORY PVT LTD

NABL Accredited Testing Laboratory (ISO/IEC 17025:2017)



TEST REPORT

Test Report No: KGS/0222/TR/A-129			
Client Name & Address		M/S.RAGAVENDRA MINERALS AND CHEMICALS , Mr.E.Dhanapal(Managing Partner) , No.D/364,1st Cross ,Ukkirakaliamman Koil Street, Anna Nagar , Thennur , Trichy ,Tamilnadu - 620017	
Site Location		S.F.Nos. 809/2, 809/3, 809/4, 809/5 (P) Extent 2.51.5 ha, Thennilai Village, Kadavur aluk, Karur District, Tamilnadu.	
Discipline	Chemical	General Sampling Procedure	IS 5182 Part 5&Part 14
Group	Atmospheric Pollution	Sample Reference Id	KGS/0222/A-129
Sample Matrix	AAQ	Sample Collected By	Chemist
Sample Description	Ambient Air Quality	Sample Collected On	December 2021 –February 2022
Sample Mark	AAQ	Sampling Time	24 Hours
Sample Received Condition	Good/PVC Container	Sample Code /Location	AAQ6 -Chinnatampatti

Monitoring Date	Particulates		Gaseous Pollutants					Other Pollutants (Particulate Phase)				
	PM ₁₀ , µg/m ³	PM _{2.5} , µg/m ³	SO ₂ , µg/m ³	NO ₂ , µg/m ³	NH ₃ , µg/m ³	O ₃ , µg/m ³	CO mg/m ³	Pb, µg/m ³	As, ng/m ³	Ni, ng/m ³	C ₆ H ₆ , µg/m ³	BaP, ng/m ³
NAAQ Norms*	100 (24 hrs.)	60 (24 hrs.)	80 (24 hrs.)	80 (24 hrs.)	400 (24 hrs.)	100 (8 hrs.)	2.0 (8hrs.)	1.0 (24 hrs.)	6.0 (annual)	20 (annual)	5.0 (annual)	1.0 (annual)
19.01.2022	36.7	19.4	6.6	20.6	<5.0	<5.0	<1.0	<0.01	<5.0	<3.0	<1.0	<3.0
20.01.2022	35.5	19.3	6.1	20.1	<5.0	<5.0	<1.0	<0.01	<5.0	<3.0	<1.0	<3.0
26.01.2022	38.1	18.0	6.5	21.9	<5.0	<5.0	<1.0	<0.01	<5.0	<3.0	<1.0	<3.0
27.01.2022	38.9	19.4	6.4	21.7	<5.0	<5.0	<1.0	<0.01	<5.0	<3.0	<1.0	<3.0
02.02.2022	37.2	19.6	6.8	21.6	<5.0	<5.0	<1.0	<0.01	<5.0	<3.0	<1.0	<3.0
03.02.2022	37.4	19.2	6.7	21.5	<5.0	<5.0	<1.0	<0.01	<5.0	<3.0	<1.0	<3.0
09.02.2022	38.2	19.3	6.2	20.9	<5.0	<5.0	<1.0	<0.01	<5.0	<3.0	<1.0	<3.0
10.02.2022	38.5	20.1	5.4	22.5	<5.0	<5.0	<1.0	<0.01	<5.0	<3.0	<1.0	<3.0
16.02.2022	36.7	20.5	6.8	21.4	<5.0	<5.0	<1.0	<0.01	<5.0	<3.0	<1.0	<3.0
17.02.2022	37.4	20.2	6.3	21.4	<5.0	<5.0	<1.0	<0.01	<5.0	<3.0	<1.0	<3.0

* NAAQS - National Ambient Air Quality Standards Issued by CPCB (Central Pollution Control Board) in 2009.

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KGS ENVIRO LABORATORY PVT LTD

NABL Accredited Testing Laboratory (ISO/IEC 17025:2017)



TEST REPORT

Test Report No: KGS/0222/TR/A-128			
Client Name & Address		M/S.RAGAVENDRA MINERALS AND CHEMICALS , Mr.E.Dhanapal(Managing Partner) , No.D/364,1st Cross ,Ukkirakaliamman Koil Street, Anna Nagar , Thennur , Trichy ,Tamilnadu - 620017	
Site Location		S.F.Nos. 809/2, 809/ 3, 809 /4, 809/5 (P) Extent 2.51.5 ha,Thennilai Village, Kadavur Taluk, Karur District, Tamilnadu.	
Discipline	Chemical	General Sampling Procedure	IS 5182 Part 5&Part14
Group	Atmospheric Pollution	Sample Reference Id	KGS/0222/A-128
Sample Matrix	AAQ	Sample Collected By	Chemist
Sample Description	Ambient Air Quality	Sample Collected On	December 2021 –February 2022
Sample Mark	AAQ	Sampling Time	24 Hours
Sample Received Condition	Good/PVC Container	Sample Code /Location	AAQ5- Budwadi

Monitoring Date	Particulates		Gaseous Pollutants					Other Pollutants (Particulate Phase)				
	PM ₁₀ , µg/m ³	PM _{2.5} , µg/m ³	SO ₂ , µg/m ³	NO ₂ , µg/m ³	NH ₃ , µg/m ³	O ₃ , µg/m ³	CO, mg/m ³	Pb, µg/m ³	As, ng/m ³	Ni, ng/m ³	C ₆ H ₆ , µg/m ³	BaP, ng/m ³
NAAQ Norms*	100 (24 hrs.)	60 (24 hrs.)	80 (24 hrs.)	80 (24 hrs.)	400 (24 hrs.)	100 (8 hrs.)	2.0 (8hrs.)	1.0 (24 hrs.)	6.0 (annual)	20 (annual)	5.0 (annual)	1.0 (annual)
01.12.2021	39.5	19.2	6.3	22.3	<5.0	<5.0	<1.0	<0.01	<5.0	<3.0	<1.0	<3.0
02.12.2021	38.9	19.4	6.7	22.3	<5.0	<5.0	<1.0	<0.01	<5.0	<3.0	<1.0	<3.0
08.12.2021	39.1	19.6	6.9	22.5	<5.0	<5.0	<1.0	<0.01	<5.0	<3.0	<1.0	<3.0
09.12.2021	38.6	19.7	7.1	22.1	<5.0	<5.0	<1.0	<0.01	<5.0	<3.0	<1.0	<3.0
15.12.2021	39.6	18.2	7.5	21.5	<5.0	<5.0	<1.0	<0.01	<5.0	<3.0	<1.0	<3.0
16.12.2021	38.3	18.6	6.4	21.6	<5.0	<5.0	<1.0	<0.01	<5.0	<3.0	<1.0	<3.0
22.12.2021	38.2	19.2	6.5	22.7	<5.0	<5.0	<1.0	<0.01	<5.0	<3.0	<1.0	<3.0
23.12.2021	39.1	19.7	6.4	22.5	<5.0	<5.0	<1.0	<0.01	<5.0	<3.0	<1.0	<3.0
29.12.2021	39.8	19.6	5.5	21.6	<5.0	<5.0	<1.0	<0.01	<5.0	<3.0	<1.0	<3.0
30.12.2021	38.5	19.9	5.7	20.9	<5.0	<5.0	<1.0	<0.01	<5.0	<3.0	<1.0	<3.0
05.01.2022	39.7	18.5	5.6	21.4	<5.0	<5.0	<1.0	<0.01	<5.0	<3.0	<1.0	<3.0
06.01.2022	41.2	18.8	5.8	21.8	<5.0	<5.0	<1.0	<0.01	<5.0	<3.0	<1.0	<3.0
12.01.2022	40.6	19.9	5.6	21.9	<5.0	<5.0	<1.0	<0.01	<5.0	<3.0	<1.0	<3.0
13.01.2022	39.2	19.7	5.9	20.2	<5.0	<5.0	<1.0	<0.01	<5.0	<3.0	<1.0	<3.0
01.12.2021	39.5	19.2	6.3	22.3	<5.0	<5.0	<1.0	<0.01	<5.0	<3.0	<1.0	<3.0
02.12.2021	38.9	19.4	6.7	22.3	<5.0	<5.0	<1.0	<0.01	<5.0	<3.0	<1.0	<3.0

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KGS ENVIRO LABORATORY PVT LTD

NABL Accredited Testing Laboratory (ISO/IEC 17025:2017)



TEST REPORT

Test Report No: KGS/0222/TR/A-128			
Client Name & Address		M/S.RAGAVENDRA MINERALS AND CHEMICALS , Mr.E.Dhanapal(Managing Partner) , No.D/364,1st Cross ,Ukkirakaliamman Koil Street, Anna Nagar , Thennur , Trichy ,Tamilnadu - 620017	
Site Location		S.F.Nos. 809/2, 809/ 3, 809 /4, 809/5 (P) Extent 2.51.5 ha,Thennilai Village, Kadavur Taluk, Karur District, Tamilnadu.	
Discipline	Chemical	General Sampling Procedure	IS 5182 Part 5&Part14
Group	Atmospheric Pollution	Sample Reference Id	KGS/0222/A-128
Sample Matrix	AAQ	Sample Collected By	Chemist
Sample Description	Ambient Air Quality	Sample Collected On	December 2021 –February 2022
Sample Mark	AAQ	Sampling Time	24 Hours
Sample Received Condition	Good/PVC Container	Sample Code /Location	AAQ5- Budwadi

Monitoring Date	Particulates		Gaseous Pollutants					Other Pollutants (Particulate Phase)				
	PM ₁₀ , µg/m ³	PM _{2.5} , µg/m ³	SO ₂ , µg/m ³	NO ₂ , µg/m ³	NH ₃ , µg/m ³	O ₃ , µg/m ³	CO mg/m ³	Pb, µg/m ³	As, ng/m ³	Ni, ng/m ³	C ₆ H ₆ , µg/m ³	BaP, ng/m ³
NAAQ Norms*	100 (24 hrs.)	60 (24 hrs.)	80 (24 hrs.)	80 (24 hrs.)	400 (24 hrs.)	100 (8 hrs.)	2.0 (8hrs.)	1.0 (24 hrs.)	6.0 (annual)	20 (annual)	5.0 (annual)	1.0 (annual)
19.01.2022	39.8	19.2	5.5	20.5	<5.0	<5.0	<1.0	<0.01	<5.0	<3.0	<1.0	<3.0
20.01.2022	41.8	19.4	5.6	20.7	<5.0	<5.0	<1.0	<0.01	<5.0	<3.0	<1.0	<3.0
26.01.2022	41.3	19.6	5.9	20.6	<5.0	<5.0	<1.0	<0.01	<5.0	<3.0	<1.0	<3.0
27.01.2022	39.5	19.7	5.7	20.9	<5.0	<5.0	<1.0	<0.01	<5.0	<3.0	<1.0	<3.0
02.02.2022	38.9	18.2	6.6	21.4	<5.0	<5.0	<1.0	<0.01	<5.0	<3.0	<1.0	<3.0
03.02.2022	37.1	18.6	6.8	21.4	<5.0	<5.0	<1.0	<0.01	<5.0	<3.0	<1.0	<3.0
09.02.2022	39.5	19.2	6.9	20.5	<5.0	<5.0	<1.0	<0.01	<5.0	<3.0	<1.0	<3.0
10.02.2022	40.1	19.7	6.8	20.1	<5.0	<5.0	<1.0	<0.01	<5.0	<3.0	<1.0	<3.0
16.02.2022	41.5	19.6	7.6	21.3	<5.0	<5.0	<1.0	<0.01	<5.0	<3.0	<1.0	<3.0
17.02.2022	42.7	19.9	7.1	20.2	<5.0	<5.0	<1.0	<0.01	<5.0	<3.0	<1.0	<3.0

* NAAQS–National Ambient Air Quality Standards Issued by CPCB (Central Pollution Control Board) in 2009.

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KGS ENVIRO LABORATORY PVT LTD

NABL Accredited Testing Laboratory (ISO/IEC 17025:2017)



TEST REPORT

Test Report No: KGS/0222/TR/A-127			
Client Name & Address		M/S.RAGAVENDRA MINERALS AND CHEMICALS, Mr.E.Dhanapal(Managing Partner) , No.D/364,1st Cross ,Ukkirakaliamman Koil Street, Anna Nagar, Thennur, Trichy, Tamilnadu - 620017	
Site Location		S.F.Nos. 809/2 , 809/ 3 , 809 / 4, 809/5 (P) Extent 2.51.5 ha,Thennilai Village, Kadavur Taluk, Karur District, Tamilnadu.	
Discipline	Chemical	General Sampling Procedure	IS 5182 Part 5&Part14
Group	Atmospheric Pollution	Sample Reference Id	KGS/0222/A-127
Sample Matrix	AAQ	Sample Collected By	Chemist
Sample Description	Ambient Air Quality	Sample Collected On	December 2021 –February 2022
Sample Mark	AAQ	Sampling Time	24 Hours
Sample Received Condition	Good/PVC Container	Sample Code /Location	AAQ4 –Mamarathupatti

Monitoring Date	Particulates		Gaseous Pollutants					Other Pollutants (Particulate Phase)				
	PM ₁₀ , µg/m ³	PM _{2.5} , µg/m ³	SO ₂ , µg/m ³	NO ₂ , µg/m ³	NH ₃ , µg/m ³	O ₃ , µg/m ³	CO mg/m ³	Pb, µg/m ³	As, ng/m ³	Ni, ng/m ³	C ₆ H ₆ , µg/m ³	BaP, ng/m ³
NAAQ Norms*	100 (24 hrs.)	60 (24 hrs.)	80 (24 hrs.)	80 (24 hrs.)	400 (24 hrs.)	100 (8 hrs.)	2.0 (8hrs.)	1.0 (24 hrs.)	6.0 (annual)	20 (annual)	5.0 (annual)	1.0 (annual)
01.12.2021	42.2	21.2	6.9	22.3	<5.0	<5.0	<1.0	<0.01	<5.0	<3.0	<1.0	<3.0
02.12.2021	41.5	22.3	6.7	22.5	<5.0	<5.0	<1.0	<0.01	<5.0	<3.0	<1.0	<3.0
08.12.2021	42.9	21.6	6.6	21.6	<5.0	<5.0	<1.0	<0.01	<5.0	<3.0	<1.0	<3.0
09.12.2021	43.7	21.6	6.4	21.7	<5.0	<5.0	<1.0	<0.01	<5.0	<3.0	<1.0	<3.0
15.12.2021	41.5	22.4	7.3	22.5	<5.0	<5.0	<1.0	<0.01	<5.0	<3.0	<1.0	<3.0
16.12.2021	44.6	22.5	7.5	21.6	<5.0	<5.0	<1.0	<0.01	<5.0	<3.0	<1.0	<3.0
22.12.2021	42.2	21.3	7.1	21.8	<5.0	<5.0	<1.0	<0.01	<5.0	<3.0	<1.0	<3.0
23.12.2021	44.3	21.3	7.5	22.5	<5.0	<5.0	<1.0	<0.01	<5.0	<3.0	<1.0	<3.0
29.12.2021	44.5	21.8	4.1	21.6	<5.0	<5.0	<1.0	<0.01	<5.0	<3.0	<1.0	<3.0
30.12.2021	43.3	19.6	5.4	22.5	<5.0	<5.0	<1.0	<0.01	<5.0	<3.0	<1.0	<3.0
05.01.2022	44.5	19.9	7.8	23.6	<5.0	<5.0	<1.0	<0.01	<5.0	<3.0	<1.0	<3.0
06.01.2022	45.6	21.6	7.9	22.7	<5.0	<5.0	<1.0	<0.01	<5.0	<3.0	<1.0	<3.0
12.01.2022	41.9	19.4	6.4	22.6	<5.0	<5.0	<1.0	<0.01	<5.0	<3.0	<1.0	<3.0
13.01.2022	43.7	19.2	6.9	22.4	<5.0	<5.0	<1.0	<0.01	<5.0	<3.0	<1.0	<3.0

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KGS ENVIRO LABORATORY PVT LTD

NABL Accredited Testing Laboratory (ISO/IEC 17025:2017)



TEST REPORT

Test Report No: KGS/0222/TR/A-127			
Client Name & Address		M/S.RAGAVENDRA MINERALS AND CHEMICALS, Mr.E.Dhanapal(Managing Partner) , No.D/364,1st Cross ,Ukkirakaliamman Koil Street, Anna Nagar, Thennur, Trichy, Tamilnadu - 620017	
Site Location		S.F.Nos. 809/2 , 809/ 3 , 809 / 4, 809/5 (P) Extent 2.51.5 ha,Thennilai Village, Kadavur Taluk, Karur District, Tamilnadu.	
Discipline	Chemical	General Sampling Procedure	IS 5182 Part 5&Part14
Group	Atmospheric Pollution	Sample Reference Id	KGS/0222/A-127
Sample Matrix	AAQ	Sample Collected By	Chemist
Sample Description	Ambient Air Quality	Sample Collected On	December 2021 –February 2022
Sample Mark	AAQ	Sampling Time	24 Hours
Sample Received Condition	Good/PVC Container	Sample Code /Location	AAQ4 –Mamarathupatti

Monitoring Date	Particulates		Gaseous Pollutants					Other Pollutants (Particulate Phase)				
	PM ₁₀ , µg/m ³	PM _{2.5} , µg/m ³	SO ₂ µg/m ³	NO ₂ , µg/m ³	NH ₃ µg/m ³	O ₃ µg/m ³	CO mg/m ³	Pb, µg/m ³	As, ng/m ³	Ni, ng/m ³	C ₆ H ₆ , µg/m ³	BaP, ng/m ³
NAAQ Norms*	100 (24 hrs.)	60 (24 hrs.)	80 (24 hrs.)	80 (24 hrs.)	400 (24 hrs.)	100 (8 hrs.)	2.0 (8hrs.)	1.0 (24 hrs.)	6.0 (annual)	20 (annual)	5.0 (annual)	1.0 (annual)
19.01.2022	41.6	20.3	6.7	21.3	<5.0	<5.0	<1.0	<0.01	<5.0	<3.0	<1.0	<3.0
20.01.2022	42.3	21.3	6.8	24.5	<5.0	<5.0	<1.0	<0.01	<5.0	<3.0	<1.0	<3.0
26.01.2022	42.3	19.6	6.1	24.6	<5.0	<5.0	<1.0	<0.01	<5.0	<3.0	<1.0	<3.0
27.01.2022	45.8	19.2	6.4	24.3	<5.0	<5.0	<1.0	<0.01	<5.0	<3.0	<1.0	<3.0
02.02.2022	41.7	18.4	7.3	21.4	<5.0	<5.0	<1.0	<0.01	<5.0	<3.0	<1.0	<3.0
03.02.2022	42.6	20.3	7.3	23.6	<5.0	<5.0	<1.0	<0.01	<5.0	<3.0	<1.0	<3.0
09.02.2022	42.2	21.4	7.6	23.9	<5.0	<5.0	<1.0	<0.01	<5.0	<3.0	<1.0	<3.0
10.02.2022	40.3	21.6	7.1	23.6	<5.0	<5.0	<1.0	<0.01	<5.0	<3.0	<1.0	<3.0
16.02.2022	42.9	21.5	7.4	22.1	<5.0	<5.0	<1.0	<0.01	<5.0	<3.0	<1.0	<3.0
17.02.2022	40.7	21.3	7.2	22.1	<5.0	<5.0	<1.0	<0.01	<5.0	<3.0	<1.0	<3.0
23.02.2022	43.9	21.5	7.5	22.6	<5.0	<5.0	<1.0	<0.01	<5.0	<3.0	<1.0	<3.0
24.02.2022	41.5	21.9	7.8	23.9	<5.0	<5.0	<1.0	<0.01	<5.0	<3.0	<1.0	<3.0

* NAAQS–National Ambient Air Quality Standards Issued by CPCB (Central Pollution Control Board) in 2009.

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KGS ENVIRO LABORATORY PVT LTD

NABL Accredited Testing Laboratory (ISO/IEC 17025:2017)



TEST REPORT

Test Report No: KGS/0222/TR/A-126		M/S.RAGAVENDRA MINERALS AND CHEMICALS, Mr.E.Dhanapal(Managing Partner), No.D/364,1st Cross ,Ukkirakaliamman Koil Street, Anna Nagar , Thennur , Trichy ,Tamilnadu - 620017	
Client Name & Address		S.F.Nos 809/2 , 809/ 3 , 809 / 4, 809/5 (P) Extent 2.51.5 ha, Thennilai Village, Kadavur Taluk, Karur District, Tamilnadu.	
Site Location		General Sampling Procedure	IS 5182 Part 5&Part14
Discipline	Chemical	Sample Reference Id	KGS/0222/A-126
Group	Atmospheric Pollution	Sample Collected By	Chemist
Sample Matrix	AAQ	Sample Collected On	December 2021 – February 2022
Sample Description	Ambient Air Quality	Sampling Time	24 Hours
Sample Mark	AAQ	Sample Code/Location	AAQ3- Thalambakoundanur
Sample Received Condition	Good/PVC Container		

Monitoring Date	Particulates		Gaseous Pollutants					Other Pollutants (Particulate Phase)				
	PM ₁₀ , µg/m ³	PM _{2.5} , µg/m ³	SO ₂ , µg/m ³	NO ₂ , µg/m ³	NH ₃ , µg/m ³	O ₃ , µg/m ³	CO mg/m ³	Pb, µg/m ³	As, ng/m ³	Ni, ng/m ³	C ₆ H ₆ , µg/m ³	BaP, ng/m ³
NAAQ Norms*	100 (24 hrs.)	60 (24 hrs.)	80 (24 hrs.)	80 (24 hrs.)	400 (24 hrs.)	100 (8 hrs.)	2.0 (8hrs.)	1.0 (24 hrs.)	6.0 (annual)	20 (annual)	5.0 (annual)	1.0 (annual)
01.12.2021	39.3	19.6	7.9	23.8	<5.0	<5.0	<1.0	<0.01	<5.0	<3.0	<1.0	<3.0
02.12.2021	38.3	19.2	7.8	23.6	<5.0	<5.0	<1.0	<0.01	<5.0	<3.0	<1.0	<3.0
08.12.2021	39.3	19.4	7.8	23.5	<5.0	<5.0	<1.0	<0.01	<5.0	<3.0	<1.0	<3.0
09.12.2021	39.4	18.2	7.2	23.4	<5.0	<5.0	<1.0	<0.01	<5.0	<3.0	<1.0	<3.0
15.12.2021	40.2	18.6	7.6	24.3	<5.0	<5.0	<1.0	<0.01	<5.0	<3.0	<1.0	<3.0
16.12.2021	41.2	18.2	6.9	24.9	<5.0	<5.0	<1.0	<0.01	<5.0	<3.0	<1.0	<3.0
22.12.2021	40.3	19.3	6.7	24.6	<5.0	<5.0	<1.0	<0.01	<5.0	<3.0	<1.0	<3.0
23.12.2021	38.2	19.6	6.8	24.7	<5.0	<5.0	<1.0	<0.01	<5.0	<3.0	<1.0	<3.0
29.12.2021	38.5	19.5	8.3	24.2	<5.0	<5.0	<1.0	<0.01	<5.0	<3.0	<1.0	<3.0
30.12.2021	39.7	19.5	8.6	24.5	<5.0	<5.0	<1.0	<0.01	<5.0	<3.0	<1.0	<3.0
05.01.2022	39.6	19.3	8.9	23.1	<5.0	<5.0	<1.0	<0.01	<5.0	<3.0	<1.0	<3.0
06.01.2022	39.2	19.5	8.4	23.5	<5.0	<5.0	<1.0	<0.01	<5.0	<3.0	<1.0	<3.0
12.01.2022	37.6	19.2	8.2	23.8	<5.0	<5.0	<1.0	<0.01	<5.0	<3.0	<1.0	<3.0
13.01.2022	37.5	19.8	8.6	23.9	<5.0	<5.0	<1.0	<0.01	<5.0	<3.0	<1.0	<3.0

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KGS ENVIRO LABORATORY PVT LTD

NABL Accredited Testing Laboratory (ISO/IEC 17025:2017)



TEST REPORT

Test Report No: KGS/0222/TR/A-126		M/S.RAGAVENDRA MINERALS AND CHEMICALS , Mr.E.Dhanapal(Managing Partner) , No.D/364,1st Cross ,Ukkirakaliamman Koil Street, Anna Nagar , Thennur , Trichy ,Tamilnadu - 620017	
Client Name & Address		S.F.Nos 809/2 , 809/ 3 , 809 / 4, 809/5 (P) Extent 2.51.5 ha, Thennilai Village, Kadavur Taluk, Karur District, Tamilnadu.	
Site Location		General Sampling Procedure IS 5182 Part 5&Part I4	
Discipline	Chemical	Sample Reference Id	KGS/0222/A-126
Group	Atmospheric Pollution	Sample Collected By	Chemist
Sample Matrix	AAQ	Sample Collected On	December 2021 – February 2022
Sample Description	Ambient Air Quality	Sampling Time	24 Hours
Sample Mark	AAQ	Sample Code/Location	AAQ3- Thalambakoundanur
Sample Received Condition	Good/PVC Container		

Monitoring Date	Particulates		Gaseous Pollutants					Other Pollutants (Particulate Phase)				
	PM ₁₀ , µg/m ³	PM _{2.5} , µg/m ³	SO ₂ , µg/m ³	NO ₂ , µg/m ³	NH ₃ , µg/m ³	O ₃ , µg/m ³	CO mg/m ³	Pb, µg/m ³	As, ng/m ³	Ni, ng/m ³	C ₆ H ₆ , µg/m ³	BaP, ng/m ³
NAAQ Norms*	100 (24 hrs.)	60 (24 hrs.)	80 (24 hrs.)	80 (24 hrs.)	400 (24 hrs.)	100 (8 hrs.)	2.0 (8hrs.)	1.0 (24 hrs.)	6.0 (annual)	20 (annual)	5.0 (annual)	1.0 (annual)
19.01.2022	37.3	19.3	8.4	24.1	<5.0	<5.0	<1.0	<0.01	<5.0	<3.0	<1.0	<3.0
20.01.2022	40.2	20.2	7.6	24.5	<5.0	<5.0	<1.0	<0.01	<5.0	<3.0	<1.0	<3.0
26.01.2022	40.6	20.3	7.4	24.7	<5.0	<5.0	<1.0	<0.01	<5.0	<3.0	<1.0	<3.0
27.01.2022	40.9	20.4	7.7	24.8	<5.0	<5.0	<1.0	<0.01	<5.0	<3.0	<1.0	<3.0
02.02.2022	41.3	20.5	7.9	23.2	<5.0	<5.0	<1.0	<0.01	<5.0	<3.0	<1.0	<3.0
03.02.2022	41.7	20.6	8.3	23.5	<5.0	<5.0	<1.0	<0.01	<5.0	<3.0	<1.0	<3.0
09.02.2022	39.2	20.7	7.3	23.1	<5.0	<5.0	<1.0	<0.01	<5.0	<3.0	<1.0	<3.0
10.02.2022	38.8	18.3	7.2	23.8	<5.0	<5.0	<1.0	<0.01	<5.0	<3.0	<1.0	<3.0
16.02.2022	38.7	20.3	7.2	24.1	<5.0	<5.0	<1.0	<0.01	<5.0	<3.0	<1.0	<3.0
17.02.2022	41.3	20.1	7.8	24.8	<5.0	<5.0	<1.0	<0.01	<5.0	<3.0	<1.0	<3.0
23.02.2022	41.5	20.6	6.8	25.1	<5.0	<5.0	<1.0	<0.01	<5.0	<3.0	<1.0	<3.0
24.02.2022	41.6	20.8	6.4	25.4	<5.0	<5.0	<1.0	<0.01	<5.0	<3.0	<1.0	<3.0

* NAAQS--National Ambient Air Quality Standards Issued by CPCB (Central Pollution Control Board) in 2009.

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KGS ENVIRO LABORATORY PVT LTD

NABL Accredited Testing Laboratory (ISO/IEC 17025:2017)



TEST REPORT

Test Report No: KGS/0222/TR/A-125		M/S.RAGAVENDRA MINERALS AND CHEMICALS , Mr.E.Dhanapal(Managing Partner) , No.D/364,1st Cross ,Ukkirakaliamman Koil Street, Anna Nagar , Thennur , Trichy ,Tamilnadu - 620017	
Client Name & Address			
Site Location		S.F.Nos 809/2 , 809/ 3 , 809 / 4, 809/5 (P) Extent 2.51.5 ha,Thennilai Village, Kadavur Taluk, Karur District, Tamilnadu.	
Discipline	Chemical	General Sampling Procedure	IS 5182 Part 5&Part14
Group	Atmospheric Pollution	Sample Reference Id	KGS/0222/A-125
Sample Matrix	AAQ	Sample Collected By	Chemist
Sample Description	Ambient Air Quality	Sample Collected On	December 2021 – February 2022
Sample Mark	AAQ	Sampling Time	24 Hours
Sample Received Condition	Good/PVC Container	Sample Code /Location	AAQ2-Core Zone

Monitoring Date	Particulates		Gaseous Pollutants					Other Pollutants (Particulate Phase)				
	PM ₁₀ , µg/m ³	PM _{2.5} , µg/m ³	SO ₂ , µg/m ³	NO ₂ , µg/m ³	NH ₃ , µg/m ³	O ₃ , µg/m ³	CO, mg/m ³	Pb, µg/m ³	As, ng/m ³	Ni, ng/m ³	C ₆ H ₆ , µg/m ³	BaP, ng/m ³
NAAQ Norms*	100 (24 hrs.)	60 (24 hrs.)	80 (24 hrs.)	80 (24 hrs.)	400 (24 hrs.)	100 (8 hrs.)	2.0 (8hrs.)	1.0 (24 hrs.)	6.0 (annual)	20 (annual)	5.0 (annual)	1.0 (annual)
01.12.2021	45.7	23.7	6.9	23.5	<5.0	<5.0	<1.0	<0.01	<5.0	<3.0	<1.0	<3.0
02.12.2021	45.3	24.6	6.5	22.9	<5.0	<5.0	<1.0	<0.01	<5.0	<3.0	<1.0	<3.0
08.12.2021	42.7	25.3	6.9	21.7	<5.0	<5.0	<1.0	<0.01	<5.0	<3.0	<1.0	<3.0
09.12.2021	41.4	21.8	7.3	25.4	<5.0	<5.0	<1.0	<0.01	<5.0	<3.0	<1.0	<3.0
15.12.2021	47.6	23.6	7.8	25.6	<5.0	<5.0	<1.0	<0.01	<5.0	<3.0	<1.0	<3.0
16.12.2021	45.3	22.5	7.5	22.9	<5.0	<5.0	<1.0	<0.01	<5.0	<3.0	<1.0	<3.0
22.12.2021	44.6	23.4	7.8	21.8	<5.0	<5.0	<1.0	<0.01	<5.0	<3.0	<1.0	<3.0
23.12.2021	44.5	24.9	7.4	23.4	<5.0	<5.0	<1.0	<0.01	<5.0	<3.0	<1.0	<3.0
29.12.2021	43.9	23.6	7.6	21.6	<5.0	<5.0	<1.0	<0.01	<5.0	<3.0	<1.0	<3.0
30.12.2021	43.6	25.5	7.3	23.9	<5.0	<5.0	<1.0	<0.01	<5.0	<3.0	<1.0	<3.0
05.01.2022	46.9	24.6	7.8	21.5	<5.0	<5.0	<1.0	<0.01	<5.0	<3.0	<1.0	<3.0
06.01.2022	45.6	25.3	8.6	23.6	<5.0	<5.0	<1.0	<0.01	<5.0	<3.0	<1.0	<3.0
12.01.2022	42.8	25.9	8.1	24.5	<5.0	<5.0	<1.0	<0.01	<5.0	<3.0	<1.0	<3.0
13.01.2022	44.4	23.3	8.6	22.9	<5.0	<5.0	<1.0	<0.01	<5.0	<3.0	<1.0	<3.0

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KGS ENVIRO LABORATORY PVT LTD

NABL Accredited Testing Laboratory (ISO/IEC 17025:2017)



TEST REPORT

Test Report No: KGS/0222/TR/A-125		M/S.RAGAVENDRA MINERALS AND CHEMICALS, Mr.E.Dhanapal(Managing Partner) , No.D/364,1st Cross ,Ukkirakaliamman Koil Street, Anna Nagar , Thennur , Trichy ,Tamilnadu - 620017	
Client Name & Address		S.F.Nos 809/2 , 809/3 , 809 / 4, 809/5 (P) Extent 2.51.5 ha,Thennilai Village, Kadavur Taluk, Karur District, Tamilnadu.	
Site Location		General Sampling Procedure	IS 5182 Part 5&Part14
Discipline	Chemical	Sample Reference Id	KGS/0222/A-125
Group	Atmospheric Pollution	Sample Collected By	Chemist
Sample Matrix	AAQ	Sample Collected On	December 2021 – February 2022
Sample Description	Ambient Air Quality	Sampling Time	24 Hours
Sample Mark	AAQ	Sample Code /Location	AAQ2-Core Zone
Sample Received Condition	Good/PVC Container		

Monitoring Date	Particulates		Gaseous Pollutants					Other Pollutants (Particulate Phase)				
	PM ₁₀ , µg/m ³	PM _{2.5} , µg/m ³	SO ₂ , µg/m ³	NO ₂ , µg/m ³	NH ₃ , µg/m ³	O ₃ , µg/m ³	CO mg/m ³	Pb, µg/m ³	As, ng/m ³	Ni, ng/m ³	C ₆ H ₆ , µg/m ³	BaP, ng/m ³
NAAQ Norms*	100 (24 hrs.)	60 (24 hrs.)	80 (24 hrs.)	80 (24 hrs.)	400 (24 hrs.)	100 (8 hrs.)	2.0 (8hrs.)	1.0 (24 hrs.)	6.0 (annual)	20 (annual)	5.0 (annual)	1.0 (annual)
19.01.2022	44.6	21.4	6.7	21.5	<5.0	<5.0	<1.0	<0.01	<5.0	<3.0	<1.0	<3.0
20.01.2022	45.2	23.7	7.2	23.7	<5.0	<5.0	<1.0	<0.01	<5.0	<3.0	<1.0	<3.0
26.01.2022	47.4	23.6	7.3	25.5	<5.0	<5.0	<1.0	<0.01	<5.0	<3.0	<1.0	<3.0
27.01.2022	43.4	22.4	7.5	21.8	<5.0	<5.0	<1.0	<0.01	<5.0	<3.0	<1.0	<3.0
02.02.2022	46.5	25.8	7.1	25.1	<5.0	<5.0	<1.0	<0.01	<5.0	<3.0	<1.0	<3.0
03.02.2022	44.7	24.4	7.8	24.7	<5.0	<5.0	<1.0	<0.01	<5.0	<3.0	<1.0	<3.0
09.02.2022	42.3	23.7	6.5	23.3	<5.0	<5.0	<1.0	<0.01	<5.0	<3.0	<1.0	<3.0
10.02.2022	43.6	24.9	6.8	22.8	<5.0	<5.0	<1.0	<0.01	<5.0	<3.0	<1.0	<3.0
16.02.2022	42.9	23.7	6.4	23.5	<5.0	<5.0	<1.0	<0.01	<5.0	<3.0	<1.0	<3.0
17.02.2022	43.9	24.3	6.7	24.4	<5.0	<5.0	<1.0	<0.01	<5.0	<3.0	<1.0	<3.0
23.02.2022	44.7	23.4	6.8	25.3	<5.0	<5.0	<1.0	<0.01	<5.0	<3.0	<1.0	<3.0
24.02.2022	44.4	24.3	6.1	23.7	<5.0	<5.0	<1.0	<0.01	<5.0	<3.0	<1.0	<3.0

* NAAQS-National Ambient Air Quality Standards Issued by CPCB (Central Pollution Control Board) in 2009.

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KGS ENVIRO LABORATORY PVT LTD

NABL Accredited Testing Laboratory (ISO/IEC 17025:2017)



TEST REPORT

Test Report No: KGS/0222/TR/A-124			
Client Name & Address		M/S.RAGAVENDRA MINERALS AND CHEMICALS , Mr.E.Dhanapal(Managing Partner) , No.D/364,1st Cross ,Ukkirakaliamman Koil Street, Anna Nagar , Thennur , Trichy ,Tamilnadu - 620017	
Site Location		S.F.No. 809/2, 809/ 3, 809 / 4, 809/5 (P) Extent 2.51.5 ha, Thennilai Village, Kadavur Taluk, Karur District, Tamilnadu.	
Discipline	Chemical	General Sampling Procedure	IS 5182 Part 5&Part 14
Group	Atmospheric Pollution	Sample Reference Id	KGS/0222/A-124
Sample Matrix	AAQ	Sample Collected By	Chemist
Sample Description	Ambient Air Quality	Sample Collected On	December 2021 –February 2022
Sample Mark	AAQ	Sample Received Condition	Good/PVC Container
Sampling Time	24 Hours	Sample Code / Location	AAQ1- Core Zone

Monitoring Date	Particulates		Gaseous Pollutants					Other Pollutants (Particulate Phase)				
	PM ₁₀ , µg/m ³	PM _{2.5} , µg/m ³	SO ₂ , µg/m ³	NO ₂ , µg/m ³	NH ₃ , µg/m ³	O ₃ , µg/m ³	CO mg/m ³	Pb, µg/m ³	As, ng/m ³	Ni, ng/m ³	C ₆ H ₆ , µg/m ³	BaP, ng/m ³
NAAQ Norms*	100 (24 hrs.)	60 (24 hrs.)	80 (24 hrs.)	80 (24 hrs.)	400 (24 hrs.)	100 (8 hrs.)	2.0 (8hrs.)	1.0 (24 hrs.)	6.0 (annual)	20 (annual)	5.0 (annual)	1.0 (annual)
01.12.2021	44.1	22.5	8.3	20.9	<5.0	<5.0	<1.0	<0.01	<5.0	<3.0	<1.0	<3.0
02.12.2021	46.3	26.4	8.1	21.2	<5.0	<5.0	<1.0	<0.01	<5.0	<3.0	<1.0	<3.0
08.12.2021	42.1	25.3	8.3	22.9	<5.0	<5.0	<1.0	<0.01	<5.0	<3.0	<1.0	<3.0
09.12.2021	41.6	23.2	8.4	21.2	<5.0	<5.0	<1.0	<0.01	<5.0	<3.0	<1.0	<3.0
15.12.2021	42.3	26.7	8.3	21.4	<5.0	<5.0	<1.0	<0.01	<5.0	<3.0	<1.0	<3.0
16.12.2021	42.7	23.9	7.9	22.2	<5.0	<5.0	<1.0	<0.01	<5.0	<3.0	<1.0	<3.0
22.12.2021	44.3	24.5	8.5	20.3	<5.0	<5.0	<1.0	<0.01	<5.0	<3.0	<1.0	<3.0
23.12.2021	44.8	25.4	7.5	22.5	<5.0	<5.0	<1.0	<0.01	<5.0	<3.0	<1.0	<3.0
29.12.2021	42.2	26.8	7.6	22.2	<5.0	<5.0	<1.0	<0.01	<5.0	<3.0	<1.0	<3.0
30.12.2021	42.3	23.9	8.2	21.9	<5.0	<5.0	<1.0	<0.01	<5.0	<3.0	<1.0	<3.0
05.01.2022	41.6	26.4	8.4	21.2	<5.0	<5.0	<1.0	<0.01	<5.0	<3.0	<1.0	<3.0
06.01.2022	43.7	24.4	8.6	21.6	<5.0	<5.0	<1.0	<0.01	<5.0	<3.0	<1.0	<3.0
12.01.2022	42.7	26.5	8.7	21.4	<5.0	<5.0	<1.0	<0.01	<5.0	<3.0	<1.0	<3.0
13.01.2022	44.9	26.7	8.9	22.5	<5.0	<5.0	<1.0	<0.01	<5.0	<3.0	<1.0	<3.0

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KGS ENVIRO LABORATORY PVT LTD

NABL Accredited Testing Laboratory (ISO/IEC 17025:2017)



TEST REPORT

Test Report No: KGS/0222/TR/A-124		M/S.RAGAVENDRA MINERALS AND CHEMICALS, Mr.E.Dhanapal(Managing Partner), No.D/364,1st Cross ,Ukkirakaliamman Koil Street, Anna Nagar , Thennur , Trichy ,Tamilnadu - 620017	
Client Name & Address		S.F.No. 809/2, 809/ 3, 809 / 4, 809/5 (P) Extent 2.51.5 ha, Thennilai Village, Kadavur Taluk, Karur District, Tamilnadu.	
Discipline	Chemical	General Sampling Procedure	IS 5182 Part 5&Part14
Group	Atmospheric Pollution	Sample Reference Id	KGS/0222/A-124
Sample Matrix	AAQ	Sample Collected By	Chemist
Sample Description	Ambient Air Quality	Sample Collected On	December 2021 –February 2022
Sample Mark	AAQ	Sample Received Condition	Good/PVC Container
Sampling Time	24 Hours	Sample Code / Location	AAQ1- Core Zone

Monitoring Date	Particulates		Gaseous Pollutants					Other Pollutants (Particulate Phase)				
	PM ₁₀ , µg/m ³	PM _{2.5} , µg/m ³	SO ₂ , µg/m ³	NO ₂ , µg/m ³	NH ₃ , µg/m ³	O ₃ , µg/m ³	CO, mg/m ³	Pb, µg/m ³	As, ng/m ³	Ni, ng/m ³	C ₆ H ₆ , µg/m ³	BaP, ng/m ³
NAAQ Norms*	100 (24 hrs.)	60 (24 hrs.)	80 (24 hrs.)	80 (24 hrs.)	400 (24 hrs.)	100 (8 hrs.)	2.0 (8hrs.)	1.0 (24 hrs.)	6.0 (annual)	20 (annual)	5.0 (annual)	1.0 (annual)
19.01.2022	42.7	23.6	7.3	22.3	<5.0	<5.0	<1.0	<0.01	<5.0	<3.0	<1.0	<3.0
20.01.2022	42.8	25.5	7.5	22.3	<5.0	<5.0	<1.0	<0.01	<5.0	<3.0	<1.0	<3.0
26.01.2022	41.4	26.7	7.6	21.1	<5.0	<5.0	<1.0	<0.01	<5.0	<3.0	<1.0	<3.0
27.01.2022	42.8	26.7	7.4	21.7	<5.0	<5.0	<1.0	<0.01	<5.0	<3.0	<1.0	<3.0
02.02.2022	42.9	25.4	7.8	22.4	<5.0	<5.0	<1.0	<0.01	<5.0	<3.0	<1.0	<3.0
03.02.2022	41.5	25.8	7.6	21.2	<5.0	<5.0	<1.0	<0.01	<5.0	<3.0	<1.0	<3.0
09.02.2022	42.7	26.9	7.1	21.9	<5.0	<5.0	<1.0	<0.01	<5.0	<3.0	<1.0	<3.0
10.02.2022	42.5	26.3	7.8	22.7	<5.0	<5.0	<1.0	<0.01	<5.0	<3.0	<1.0	<3.0
16.02.2022	41.3	25.7	7.6	23.4	<5.0	<5.0	<1.0	<0.01	<5.0	<3.0	<1.0	<3.0
17.02.2022	42.9	24.1	7.9	22.8	<5.0	<5.0	<1.0	<0.01	<5.0	<3.0	<1.0	<3.0
23.02.2022	43.7	24.7	8.3	22.7	<5.0	<5.0	<1.0	<0.01	<5.0	<3.0	<1.0	<3.0
24.02.2022	44.4	24.0	8.4	21.4	<5.0	<5.0	<1.0	<0.01	<5.0	<3.0	<1.0	<3.0

* NAAQS- National Ambient Air Quality Standards Issued by CPCB (Central Pollution Control Board) in 2009,

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Geo Exploration & Mining Solutions, Salem

No. 17, Advaita Ashram Road, Fairlands, Salem – 636 004, Tamilnadu, India.

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S.No	Sector Description	Sector (as per)		Cat.
		NABET	MoEFCC	
1	Mining of minerals opencast only	1	1 (a) (i)	A
2	Industrial estates/ parks/ complexes/areas, export processing Zones (EPZs), Special Economic Zones (SEZs), Biotech Parks, Leather Complexes	31	7 (c)	B
3	Building and construction projects	38	8(a)	B

Note: Names of approved EIA Coordinators and Functional Area Experts are mentioned in RAAC minutes dated Jan 06, 2023 and posted on QCI-NABET website.

The Accreditation shall remain in force subject to continued compliance to the terms and conditions mentioned in QCI-NABET's letter of accreditation bearing no QCI/NABET/ENV/ACO/23/2684 dated Feb 20, 2023. The accreditation needs to be renewed before the expiry date by Geo Exploration & Mining Solutions, Salem following due process of assessment.

Sr. Director, NABET
Dated: Feb 20, 2023

Certificate No.
NABET/EIA/2225/RA 0276

Valid up to
August 06, 2025

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