

DRAFT ENVIRONMENTAL IMPACT ASSESSMENT REPORT

For

Rough Stone and Gravel Quarry – 3.01.00 Ha

At

**S.F. No: 302/1 (1.70.50Ha.), 304/1A (0.54.00Ha.) &
304/2A (0.76.50Ha.) of Anaikulam Village of
Veerakeralampudur Taluk, Tenkasi District, Tamilnadu**

PROJECT PROPONENT

**Thiru.N.H.M.Pandian,
S/o.Navaneethakrishna Pandian,
D.No.4/7, Kurunthan Mozhi,
Kuruchampatti Post,
Veerakeralampudur Taluk.,
Tenkasi District - 627 860.**

**Project termed under schedule 1(a).
Category B₁ (Cluster Mining)
Baseline Period: December 2023 to January 2024**

***Environmental Consultant & Laboratory Details:*
Ecotech Labs Private Limited**



**No.48, 2nd Main Road,
Ram Nagar South Extension,
Pallikaranai, Chennai-600 100**

**April
2024**

From

Date:

Thiru.N.H.M.Pandian,
S/o.Navaneethakrishna Pandian,
D.No.4/7, Kurunthan Mozhi,
Kuruchampatti Post, Veerakeralampudur Taluk.,
Tenkasi District - 627 860.

To

The District Environmental Engineer
Tamilnadu Pollution Control Board,
30/2, SIDCO Industrial Estate,
Pettai, Tirunelveli – 627 010.

Sir/Madam,

Sub: Public Hearing for “Thiru.N.H.M.Pandian Rough Stone and Gravel Quarry” over a total extent of 3.01.00 Ha at S.F.Nos. 302/1, 304/1A & 304/2A Anaikulam Village, Veerakeralampudur Taluk, Tenkasi District, Tamil Nadu – Reg,

Ref: ToR issued by SEIAA vide Letter No. SEIAA-TN/F.No.10299/SEAC/1(a) ToR - 1644/2024 Dated: 09.010.2024.

With Reference to the above subject, I propose to establish “Thiru.N.H.M.Pandian Rough Stone and Gravel Quarry” over a total extent of 3.01.00 Ha at S.F.Nos. 302/1, 304/1A & 304/2A Anaikulam Village, Veerakeralampudur Taluk, Tenkasi District, Tamil Nadu – Reg,

In this regard, we had obtained the Terms of Reference (ToR) from State Environmental Impact Assessment Authority (SEIAA), Tamil Nadu for conducting EIA studies vide letter cited in reference. Further, we have prepared the draft EIA report complying with all the conditions imposed in the TOR issued.

I herewith submitting hard & soft copies of Draft EIA Report, Executive Summaries (English & Tamil) along with necessary enclosures towards conducting public hearing for “Thiru.N.H.M. Pandian Rough Stone and Gravel Quarry” over a total extent of 3.01.00

Ha at S.F.Nos. 302/1, 304/1A & 304/2A Anaikulam Village, Veerakeralampudur Taluk,
Tenkasi District, Tamil Nadu.

We have also enclosed a Demand Draft for Rs. _____/- vide DD No
_____ dated _____ as initial Public Hearing fee and agree to pay the
difference amount in the publication cost.

We kindly request the TNPCB to make the necessary arrangements for conducting the
public hearing for the Rough Stone and Gravel Quarry.

Thanking you,
Yours Sincerely,

Authorized Signatory

Thiru.N.H.M.Pandian,
S/o.Navaneethakrishna Pandian,
D.No.4/7, Kurunthan Mozhi,
Kuruchampatti Post, Veerakeralampudur Taluk,
Tenkasi District - 627 860.

UNDERTAKING

I, Thiru.N.H.M.Pandian, undertaking that the Draft Environmental Impact Assessment (EIA) Report for Rough Stone, Jelly and Gravel Quarry over an extent of 3.01.00 Ha at S.F.No. 302/1, 304/1A & 304/2A Anaikulam Village, Veerakeralampudur Taluk, Tenkasi District, Tamilnadu State under project category B1 and Schedule S.No.1(a)

ToR issued by SEIAA vide Letter No. SEIAA-TN/F.No.10299/SEAC/1(a) ToR - 1644/2024
Dated: 09.010.2024.

I, hereby assure that all the information and data provided in the EIA report is accurate, true and correct and owns responsibility for the same.

Place: Tenkasi

Date:

Yours faithfully

Thiru. N.H.M.Pandian

Plot No.48A, 2nd Main Road,
Ram Nagar, South Extension,
Pallikaranai, Chennai - 600 100.
GST NO. 33AADCE6103A2ZH
PAN NO. AADCE6103A



Eco Tech Labs Pvt Ltd

Cell No. 98400 87542
Email : info@ecotechlabs.in
Website : www.ecotechlabs.in
CIN : U74900TN2014PTC094895

UNDERTAKING

I, Dr. A. Dhamodharan, Managing Director confirms that this Draft EIA Report of Rough Stone and Gravel Quarry over an extent of 3.01.00 Ha at S.F.No. 302/1, 304/1A & 304/2A Anaikulam Village, Veerakeralampudur Taluk, Tenkasi District, Tamil Nadu State has been prepared at M/s.Ecotech Labs Pvt. Ltd., Chennai.

I also confirm that I shall be fully accountable for any misleading information mentioned in this Report.

Signature:



Name: Dr. A. Dhamodharan

Designation: Managing Director

Name of the EIA Consultant Organization: M/s. Ecotech Labs Pvt Ltd., Chennai.

NABET Certificate No: NABET/EIA/2124/SA 0147

Date:

Place: Chennai

Declaration by Experts contributing to the EIA of Rough Stone and Gravel Quarry – 3.01.00 Ha by “Thiru.N.H.M.Pandian Rough Stone and Gravel Quarry” over a total extent of 3.01.00 Ha at S.F.Nos. 302/1, 304/1A & 304/2A Anaikulam Village, Veerakeralampudur Taluk, Tenkasi District, TamilNadu.

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

EIA Coordinator: Dr. A. Dhamodharan



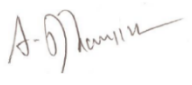
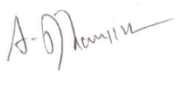
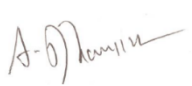
Dr. A. DHAMODHARAN
(NABET APPROVED EIA COORDINATOR)
NABET/EIA/2124/SA 0147
Environmental Consultant
Eco Tech Labs Pvt. Ltd
Plot No.48A, 2nd Main Road, Ram Nagar South Extn.
Pallikaranai, Chennai - 600 100.

Signature:

Period of involvement: 01.03.2022 to Till now.

Contact information: M/s. Ecotech Labs Pvt Ltd.,
No. 48, 2nd Main Road, Ram Nagar South Extension,
Pallikaranai – 600100.

S. No.	Functional areas	Name of the experts	Involvement (period and task)	Signature and date
1	AP	Mrs. K. Vijayalakshmi	1. Selection of Baseline Monitoring stations based on the wind direction 2. Interpretation of Baseline data by comparing it with standards prescribed by CPCB against the type of area 3. Identification of sources of air pollution and suggesting mitigation measures to minimize impact <i>Period: March 2022 – Till now</i>	

2	WP	Dr. A. Dhamodharan	1. Selection of baseline Monitoring Locations for Ground water analysis and also identifying nearest surface water to be studied. 2. Interpretation of baseline data collected 3. Identification of impacts based on the baseline study conducted and also to the ground water and nearby surface water due to the proposed project 4. Preparation of suitable and appropriate mitigation plan. Period: March 2022 – Till now	
3	SHW	Dr. A. Dhamodharan	1. Identification of nature of solid waste generated 2. Categorization of the generated waste and estimating the quantity of waste to be generated based on the per capita basis. Identification of impacts of SHW on Environment 3. Suggesting suitable mitigation measures by recommending appropriate disposal method for each category of waste generated 4. Top soil and refuse management Period: March 2022 – Till now	
4	SE	Mr. S. Pandian	1. Primary data collection through the census questionnaire 2. Obtaining Secondary data from authenticated sources and incorporating the same in EIA report. 3. Impact assessment & proposing suitable mitigation plan 4. CSR budget allocation by discussing with the local body and allotting the same for need based activity. Period: March 2022 – Till now *Involves Public Hearing	
5	EB	Dr. A. Dhamodharan	1. Primary data collection through field survey and sheet observation for ecology and biodiversity 2. Secondary Collection through various authenticated sources 3. Prediction of anticipated impacts and suggesting appropriate mitigation measures.	

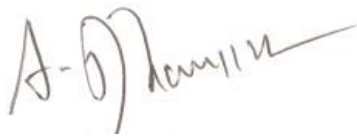
			<i>Period: March 2022 – Till now</i>	
6	HG	Dr. T. P. Natesan	1. Study of existing surface drainage arrangements in the core and buffer zone, impact due to mining on these drainage courses and suggestion of mitigative measures 2. Determination of groundwater use pattern, development of rainwater harvesting program. Storm water management through garland drainage system. <i>Period: March 2022 – Till now</i>	
7	GEO	Dr. T. P. Natesan	1. Field survey for assessing regional and local geology, aquifer distribution, Determination of groundwater use pattern, development of rainwater harvesting program. <i>Period: March 2022 – Till now</i>	
8	SC	Dr. A. Dhamodharan	1. Interpretation of baseline report 2. Identification of possible impacts on soil, prediction of soil conservation and suggesting suitable mitigation measures. <i>Period: March 2022 – Till now</i>	
9	AQ	Mrs. K. Vijayalakshmi	1. Collection of Meteorological data for the baseline study period 2. Plotting wind rose plot and thereby selecting the monitoring locations based on the wind pattern 3. Estimation of sources of air emissions and air quality modeling is done 4. Interpretation of the results obtained 5. Identification of the impacts and suggesting suitable mitigation measures. <i>Period: March 2022 – Till now</i>	

10	NV	Mrs. K. Vijayalakshmi	1. Selection of monitoring locations 2. Interpretation of baseline data 3. Prediction of impacts due to noise pollution and suggestion of appropriate mitigation measures <i>Period: May 2022 – Till now</i>	
11	LU	Dr. T. P. Natesan	1. Collection of Remote sensing satellite data to study the land use pattern. 2. Primary field survey and limited field verification for land categorization in the study area 3. Preparation of Land use map using Satellite data for 10km radius around the project site. <i>Period: March 2022 – Till now</i>	
12	RH	Mrs. K. Vijayalakshmi	1. Identification of the risk 2. Interpreting consequence contours 3. Suggesting risk mitigation measures <i>Period: March 2022 – Till now</i>	

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

I, Dr. A. Dhamodharan, hereby, confirm that the above-mentioned experts prepared the EIA report of mining project at Survey Numbers. 302/1, 304/1A & 304/2A Anaikulam Village, Veerakeralampudur Taluk, Tenkasi District, Tamil Nadu. I also confirm that the consultant organization shall be fully accountable for any misleading information mentioned in this statement.

Signature:



Name: Dr. A. Dhamodharan

Designation: Managing Director

Name of the EIA consultant organization: M/s. Eco Tech Labs Private Limited

NABET Certificate No. & Issue Date: NABET/EIA/2124/SA 0147

Project	<i>Rough stone and Gravel Quarry- 3.01.00 Ha</i>	<i>Draft EIA Report</i>
Project Proponent	<i>Thiru.N.H.M. Pandian</i>	
Project Location	<i>Anaikulam Village, Veerakeralampudur Taluk, Tenkasi District</i>	

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ABBREVIATION

LU –Land use

AP – Air Pollution monitoring, prevention and control

AQ- Meteorology, Air quality modeling and prediction

WP – Water pollution monitoring, prevention and control

EB- Ecology and Biodiversity

NV- Noise & Vibration

SE- Socio-economics

HG- Hydrology, ground water and water conservation

GEO –Geology

RH – Risk assessment and hazards management

SHW –Solid and Hazardous waste management

SC- Soil conservation

<i>Project</i>	<i>Rough stone and Gravel Quarry- 3.01.00 Ha</i>	<i>Draft EIA Report</i>
<i>Project Proponent</i>	<i>Thiru.N.H.M. Pandian</i>	
<i>Project Location</i>	<i>Anaikulam Village, Veerakeralampudur Taluk, Tenkasi District</i>	

EXECUTIVE SUMMARY

1. Project Background:

The Proposed project total extent area is 3.01.00 Ha, It is a Patta land in 302/1 (1.70.50Ha.), 304/1A (0.54.00Ha.) & 304/2A (0.76.50Ha.) at Anaikulam Village, Veerakeralampudur Taluk, Tenkasi District. The category of project is B1, It is a Rough stone and Gravel quarry in Anaikulam village. The applied lease area is Plain terrain topography and gentle slope towards south and covered by brownish red gravelly soil for 0.2m thick followed by gravel formation and massive Charnockite rock formation.

The quarry operation is proposed to carry out with conventional open cast mechanized mining with 5.0 meter vertical bench with a bench width of 5.0 meter. Quarrying operation is carried out Splitting of rock mass of considerable volume from the parent rock mass by jackhammer drilling and blasting, hydraulic excavators are used for loading the Rough stone from pithead to needy Crusher. Occasionally hydraulic excavators are attached with rock breakers for fragmentation to avoid secondary blasting.

The quarry operation is proposed up to depth for 49.0m fro the Ground Level. The Total Geological resources is about 14,02,830m³ of Rough Stone and 1,24,696m³ of Gravel. The Mineable Reserves are 3,03,165m³ of Rough stone and 65,397m³ of Gravel. Production schedule is proposed an average production of 3,03,165m³ of Rough stone and 65,397m³ of Gravel for (Sixty months) Five years only. Mining Plan was approved by the Joint Director/Assistant Director (i/c), Geology & Mining, Tenkasi vide letter Rc.No.M1/14953/2019 Dated 21.06.2023.

The project area does not fall in Hill Area Conservation Authority region. There is no interstate boundary, CRZ zone, Western Ghats, notified Bird sanctuaries as per Wildlife protection Act 1972, within the radius of 15 Km. Nellai Wildlife Sanctuary is located at the distance of 19.68 Km Northwest from the project site.

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Project Proponent	Thiru.N.H.M. Pandian	
Project Location	Anaikulam Village, Veerakeralampudur Taluk, Tenkasi District	

2. Nature & Size of the Project

The Rough Stone and Gravel Quarry over an extent of 3.01.00 Hectares land is located at Anaikulam Village, Veerakeralampudur Taluk, Tenkasi District.

Mineral intends to quarry : Rough stone and Gravel Quarry

District : Tenkasi

Taluk : Veerakeralampudur

Village : Anaikulam

S. F. Nos : 302/1, 304/1A & 304/2A

Extent : 3.01.00 Hectares

Table 1: Brief Description of the Project

S. No	Particulars	Details
1	Latitude	09°00' 05.83" to 09°00' 16.00" N
2	Longitude	77°28' 32.52" to 77°28' 37.57" E
3	Site Elevation above MSL	194.0m above MSL.
4	Topography	Plain Terrain
5	Land use of the site	Patta Land
6	Extent of lease area	3.01.0 Ha
7	Nearest highway	SH 39A – Surandai to Alankulam Road – 5.61 km – SW NH 744 – Tenkasi to Madurai Road – 15.47 km - W
8	Nearest railway station	Kadayanallur Railway Station – 15.02 km - NW
9	Nearest airport	Thoothukudi Airport – 67.87 km - NE
10	Nearest town / city	Town - Veerakeralampudur – 7.25 km - SSE. City - Tenkasi – 16.34 km - W District - Tenkasi – 16.34 km - W
11	Rivers / Canal	❖ Chittraru River – 8.71Km – SW

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12	Lake/Pond	❖ Kurichanpatti Kulam – 2.30 Km - E ❖ Kattu Kulam – 2.31 Km – S ❖ Semmannu kulam – 2.94 Km – S ❖ Mariathaipuram lake – 3.48 Km – SSW ❖ Periya Devan Kulam – 4.25 Km – E ❖ Surandai Lake – 5.98 Km – SW ❖ Arunthapet Lake – 6.57 Km – SW ❖ Echantha Lake – 6.79 Km – NNE ❖ Veeranam Lake – 7.19 Km – S ❖ Pattaikulam – 8.17 Km – NW ❖ Sakkarakulam – 8.48 Km – N ❖ Sundarapandiapuram Tank – 9.16 Km - W
13	Hills / valleys	Nil in 15 km radius
14	Archaeologically places	Nil in 15 km radius
15	National parks / Wildlife Sanctuaries	Nil in 15 km radius
16	Reserved / Protected Forests	❖ Vellakkalparambu RF – 7.13 Km – S ❖ Uthumalai RF – 9.36 – E ❖ Kottamalai RF – 13.04 Km - SE
17	Seismicity	Proposed Lease area come under Seismic zone-II (Moderate risk area)
18	Defense Installations	Nil in 15 Km radius

3. Need for the Project

- ❖ The mining activities as proposed are the backbone of all construction and infrastructure projects as the raw material for construction is available only from such mining. The Rough stone and Gravel extracted will be transported to be Stone crusher of district Tirunelveli.
- ❖ The raw Rough stone as well as the crushed material of stone is in high demand in real estate, construction projects as well as in building construction projects.
- ❖ Rough stone is quarried for producing crusher aggregates to the nearby building contractors, road contractors and nearby villagers.

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- ❖ After quarrying the entire reserves mined out, the area will be used as water reservoir to have an artificial recharge to the nearby wells.
- ❖ No damage to the land is caused, no reclamation or back filling is required.

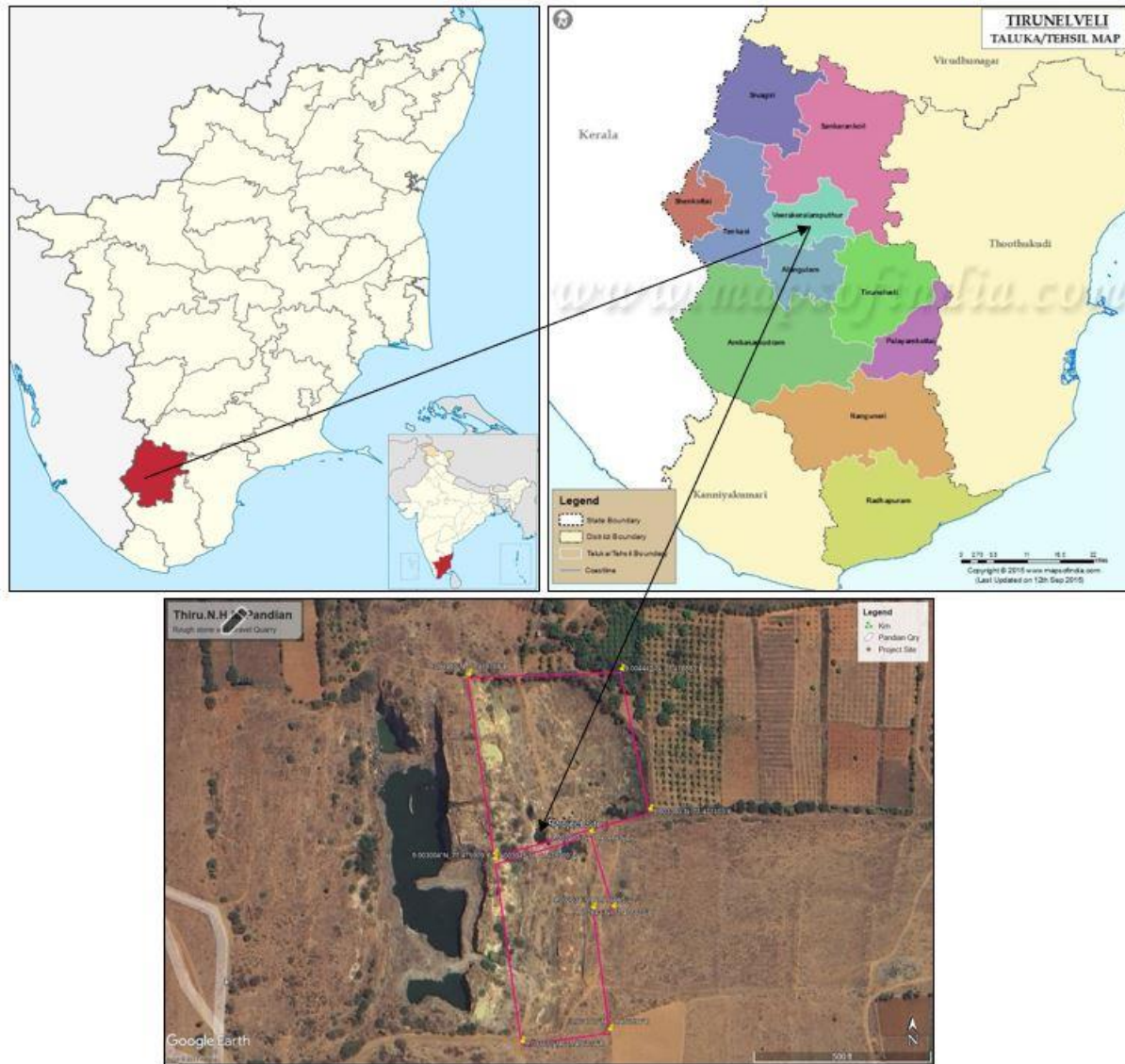


Figure 1: Location Map of the Project Site

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Figure 2: Google Image of the Project Site

4. Charnockite

Charnockite is extensively quarried as rough stone which is used as aggregates for construction of building, laying of roads and for preparation of value-added products like hollow blocks, M-sand etc. Charnockite is exposed as a discontinuous body in NW-SE to WNW-ESE direction from Tenkasi in the west to Gangaikondan in the east and from Tiruvenkadanathapuram in the north to Vijayapathi in the south.

An isolated Charnockite hill is exposed for a length of 5 km and 1 to 1.5 km width in Valliyur-Nanguneri-Radhapuram area and in the eastern slope of Western Ghats hills of Tirunelveli district. The nature of occurrence of charnockite is ubiquitous, often in two modes. One type of occurrence is in the form of profuse enclaves as lensoid bodies etc; within granitoid gneiss and leptinite and other as massive crystalline variety as seen in large isolated hills (Western Ghats massifs). Basic nature of the charnockite has been preserved only at few places where in it contains occasionally noritic/pyroxene granulite patches and calc granulite pockets. Retrogression of

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mafics – pyroxenes to hornblende and biotite aggregates and granitisation with intercalations of quartzofeldspathic veinations are the common features that characterise these enclaves. This retrograde hornblende biotite gneiss is also extensively quarried in Piranchery, Gangaikondan, and north of Manur and Rasta areas for road metals and earth fillings.

5. Geological Resources

The geological reserves have been calculated based on the cross-section method by deducting already excavated in the previous quarry workings and the availability of Geological Resources in this land is given below.

Table 2. Geological resources

SECTION	LENGTH (M)	WIDTH (M)	DEPTH (M)	ROUGH STONE VOLUME M³	GRAVEL VOLUME M³
A-A' & B-B'	136	130	4.0	-	70,720
	136	130	45.0	7,95,600	-
A-A' & C-C'	54	91	4.0	-	19,656
	54	91	45.0	2,21,130	-
A-A' & D-D'	110	78	4.0	-	34,320
	110	78	45.0	3,86,100	-
TOTAL GEOLOGICAL RESERVES				14,02,830	1,24,696
Less: Exiting Pit Excavated Already				-	21,355
BALANCE GEOLOGICAL RESERVES				14,02,830	1,03,341

Available Mineable reserves:

The available mineable reserves are calculated for the proposed lease period of 5 years based on the total minable reserves calculated by deducting 7.5m / 10.0m safety distances to the patta lands / govt. land / odai on along the boundary sides of the applied area, already excavated in the previous quarry workings and Bench losses.

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Table 3. Mineable Reserves

SECTION	LENGTH (M)	WIDTH (M)	HEIGHT (M)	ROUGH STONE VOLUME(M³)	GRAVEL VOLUME(M³)
A-A' & B-B'	117	111	4.0	-	51,948
	107	101	5.0	54,035	-
	97	91	5.0	44,135	-
	87	81	5.0	35,235	-
	77	71	5.0	27,335	-
	67	61	5.0	20,435	-
	57	51	5.0	14,535	-
	47	41	5.0	9,635	-
	37	31	5.0	5,735	-
	27	21	5.0	2,835	-
A-A' & C-C'	43	72	4.0	-	12,384
	38	62	5.0	11,780	-
	33	52	5.0	8,580	-
	28	42	5.0	5,880	-
	23	32	5.0	3,680	-
	18	22	5.0	1,980	-
A-A' & D-D'	95	59	4.0	-	22,420
	90.	49	5.0	22,050	-
	85	39	5.0	16,575	-
	80	29	5.0	11,600	-
	75	19	5.0	7,125	-
TOTAL MINEABLE RESERVES				3,03,165	86,752
Less: Existing Pit- Already Excavated				-	21,355
BALANCE MINEABLE RESERVES				3,03,165	65,397

The available mineable reserves have been computed as 3,03,165 m³ of Rough Stone and 65,397 m³ of Gravel up-to the depth of 49.0 meters from the ground level.

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Table 4. Year wise Production Plan

The applicant has proposed to carry out 3,03,165 m³ of Rough Stone and 65,397 m³ of Gravel production for the period of five years up to a depth of 49 m from the ground level.

SECTION	YEAR	LENGTH (M)	WIDTH (M)	HEIGHT (M)	ROUGH STONE VOLUME (M³)	GRAVEL VOLUME (M³)
A-A' & B-B'	I-Year	58	111	4.0	-	25,752
		48	101	5.0	24,240	-
		38	91	5.0	17,290	-
		28	81	5.0	11,340	-
		18	71	5.0	6,390	-
Less Gravel pit A-A' & B-B'		SUB-TOTAL			59,260	25,752
		58	111	1.0	-	(-)6,438
I – YEAR PRODUCTION					59,260	19,314
A-A' & B-B'	II-Year	29	111	4.0	-	12,876
		29	101	5.0	14,645	-
		29	91	5.0	13,195	-
		29	81	5.0	11,745	-
		29	71	5.0	10,295	-
		37	61	5.0	11,285	-
Less Gravel pit A-A' & B-B'		SUB-TOTAL			61,165	12,876
		29	111	1.0	-	(-)3,219
II – YEAR PRODUCTION					61,165	9,657
A-A' & B-B'	III- Year	30	111	4.0	-	13,320
		30	101	5.0	15,150	-
		30	91	5.0	13,650	-
		30	81	5.0	12,150	-
		30	71	5.0	10,650	-
		30	61	5.0	9,150	-
Less Gravel pit A-A' & B-B'		SUB-TOTAL			60,750	13,320
		30	111	1.0	-	(-)3,330
		54	12	1.0	-	(-)648
III – YEAR PRODUCTION					60,750	9,342
A-A' & C-C'	IV- YEAR	43	72	4.0	-	12,384
		38	62	5.0	11,780	-
		33	52	5.0	8,580	-
A-A' & D-D'		95	59	4.0	-	22,420
		90	49	5.0	22,050	-
		85	39	5.0	16,575	-

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Less Gravel pit A-A' & C-C' A-A' & D-D'		SUB-TOTAL			58,985	34,804	
		140	54	1.0	-	(-)7,560	
		16	10	1.0	-	(-)160	
IV – YEAR PRODUCTION					58,985	27,084	
A-A' & C-C'	V- YEAR	28	42	5.0	5,880	-	
		23	32	5.0	3,680	-	
		18	22	5.0	1,980	-	
A-A' & D-D'		80	29	5.0	11,600	-	
		75	19	5.0	7,125	-	
A-A' & B-B'		57	51	5.0	14,535	-	
		47	41	5.0	9,635	-	
		37	31	5.0	5,735	-	
		27	21	5.0	2,835	-	
V – YEAR PRODUCTION					63,005	-	
TOTAL PRODUCTION FOR FIVE YEARS					3,03,165	65,397	

6. Mining

Opencast mining

Open cast Semi-Mechanized Mining with one 5.0 meter bench for Top soil & Gravel followed by 5.0 meter vertical bench with a bench width not less than the bench height.

The Quarry operation involves shallow jack hammer drilling, blasting, loading and transportation.

Process Description

- The reserves and resources are arrived based upon the Geological investigation.
- Removal of Gravel by Excavators and directly Loaded into Tippers.
- Removal of Rough Stone by Excavators by Drilling and Blasting.
- Shallow Drilling With Jackhammer of 30-32 mm Dia.
- Minimum Blasting With Class 3 Explosives.
- Loading of Rough Stone By Excavators Into Tippers.

7. Water Requirement

Total water requirement for the mining project is 6.0 KLD. Domestic water will be sourced from nearby Anaikulam Village and other water will be source from nearby road tankers supply.

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Table 5. Water Balance

Purpose	Quantity	Source
Drinking Water	1.0KLD	Packaged Drinking water vendors available in Anaikulam village which is about 2.43 km W from the project site.
Green belt	1.5KLD	Other domestic activities through road tankers supply
Dust suppression	3.5KLD	From road tankers supply
Total	6.0 KLD	

8. Manpower

Total manpower required for the project is approximately 11 persons.

Workers will be from nearby villages.

Table 6. Man Power

a. Skilled labour	
Mines Manager	1 No
Mine foreman	1 No
Jack Hammer operator	2 Nos
Blaster / Mate	1 No
b. Unskilled – helpers	6 Nos
Total	11 Nos

No child less than 18 years will be entertained during quarrying operations.

9. Solid Waste Management

Table 7 Solid Waste Management

S.No	Type	Quantity	Disposal Method
1.	Organic	1.98 kg/day	Municipal bin including food waste
2.	Inorganic	2.97 kg/day	TNPCB authorized recycler

As per CPCB guidelines: MSW per capita/day =0.45 kg/day

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Table 8. 500m Radius Cluster Mine

S. No.	Name of the Lessee	Village & S.F.No.	Extent - Hects	Lease Status
a. Details of abandoned quarries:				
..... Nil.....				
b. Details of Expired quarries				
..... Nil.....				
c. Details of Existing Quarries				
1.	Thiru.M.Abdul Ali, S/o.Mohammed Sharffudhin, No.8, Moonusuzhi road, Vadakarai village, Shenkottai Taluk, Tenkasi District.	S.F.Nos: 1,2,11/2 & 12, Surandai Part-I (V)	4.00.0	27.03.2023 to 26.03.2024
2	Thiru.D.Sankaranarayanan, S/o. Durairaj, 9-7-7/1, Bus stand Road, Surandai, Veerakeralampudur, Tenkasi Taluk and District.	S.F. Nos: 279/3A (P) & 279/4 (P)	0.98.50	10.10.2022 to 09.10.2027
d. Present Proposed Quarries				
1.	N.H.M. Pandian, S/o. Navaneethakrishna Pandian, 4/7, Kuruthanmozhi, Kuruchampatti Post, V.K.Pudur Taluk, Tenkasi District.	S.F.Nos: 302/1, 304/1A & 304/2A Anaikulam Village	3.01.0	Instant Proposal
Total cluster area			7.99.5	

10. Land Requirement

The applied land use pattern is given as under

Table 9 Land Use Breakup

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Sl. No.	Land Use	Details
1.	Mining / Excavation at present	0.00.00 Hectares
2.	Storage of topsoil & weathered rock	0.00.00 Hectares
3.	Stocking & Mineral Dressing Yard	0.00.00 Hectares
4.	Infrastructure	0.01.00 Hectares
5.	Mine Road	0.03.00 Hectares
6.	Afforestation & Mine safety	0.82.30 Hectares
7.	Future Mining	2.14.70 Hectares
8.	Undisturbed area	0.00.00 Hectares
Total		3.01.00 Hectares

11. Human Settlement

There are no habitations within 300m radius. There are villages located in this area within 15 km radius of the quarry.

Table 10 Habitation

SL. NO.	DIRECTION	VILLAGE	DISTANCE	POPULATION
1	E	Kurichanpatti	1.56 Km	1000
2	W	Anaikulam	2.43 Km	2794
3	NW	Arunachalapuram	1.54 Km	550
4	SE	Karaiyalanur	1.12 Km	600

12. Power Requirement

The proposed Rough stone quarrying does not require any power supply for the quarrying operation.

16 Litre diesel per hour for excavator for mining and loading for Rough stone needed and **10 Litre** diesel per hour for excavator for mining and loading for Topsoil.

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13. Scope of the Baseline Study

This chapter contains information on existing environmental scenario on the following parameters.

1. Micro – Meteorology
2. Water Environment
3. Air Environment
4. Noise Environment
5. Soil / Land Environment
6. Biological Environment
7. Socio-economic Environment

13.1 Micro – Meteorology

Meteorology plays a vital role in affecting the dispersion of pollutants, once discharged into the atmosphere. Since meteorological factors show wide fluctuations with time, meaningful interpretation can be drawn only from long-term reliable data.

- i) Average Minimum Temperature : 31° C
- ii) Average Maximum Temperature. : 34°C
- iii) Average Annual Rainfall of the area: 792 mm

13.2 Air Environment

Ambient air monitoring was carried out on monthly basis in the surrounding areas of the Mine Lease area to assess the ambient air quality at the source. To know the ambient air quality at a larger distance i.e. in the study area of 5 km. radius, air quality survey has been conducted at 5 locations. Major air pollutants like Particulate Matter (PM₁₀), Sulphur Dioxide (SO₂), Nitrogen Dioxide (NO₂) were monitored and the results are summarized below.

The baseline levels of PM₁₀ (31-57 µg/m³), PM_{2.5} (12-29 µg/m³), SO₂ (5-19 µg/m³), NO₂ (8-31 µg/m³), all the parameters are well within the standards prescribed by National Ambient Air Quality during the study period from December 2023 to February 2024.

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13.3 Noise Environment

The maximum Day noise and Night noise were found to be 61 dB(A) and 52 dB(A) respectively in P.J.Sweet, Kadayanallur Road, Sendamaram. The minimum Day Noise and Night noise were 39 dB (A) and 32 dB(A) respectively which was observed in Project site. The observed values are all well within the Standards prescribed by CPCB.

13.4 Water Environment

- The average pH ranges from 7.06 – 8.24.
- TDS value varied from 274 mg/l to 1673 mg/l
- Hardness varied from 87.4 to 699 mg/l
- Chloride varied from 33.5 to 495 mg/l

13.5 Land Environment

The analysis results show that the majority of soil in the project and surrounding area is slightly alkaline in nature and pH value ranges from 6.89 to 7.86 with organic matter 0.21 to 0.45 %. The concentration of Nitrogen, Phosphorus & Potassium has been found to be in good amount in the soil samples.

13.6 Biological Environment

The proposed Mining lease area is mostly dry barren ground with small shrubs and bushes. No specific endangered flora & fauna exist within the mining lease area.

14. Rehabilitation/ Resettlement

The overall land of the mine is Patta land. There is no displacement of the population within the project area and adjacent nearby area. Social development of nearby villages will be considered in this project.

The mine area does not cover any habitation. Hence the mining activity does not involve any displacement of human settlement.

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15. Greenbelt Development

1. The development of greenbelt in the peripheral buffer zone of the mine area.
2. Green belt has been recommended as one of the major components of Environmental Management Plan, which will improve ecology, environment and quality of the surrounding area.
3. Local trees like Neem, Vilvam, Panai, etc will be planted along the lease boundary and avenues as well as over Non-active dumps at a rate of 140 trees per annum with interval 5m.
4. The rate of survival expected to be 80% in this area

Table.11 Plantation/ Afforestation Program

Name of species proposed	Survival	No of species
Neem, Vilvam, Vaagai, Eachai, Naval, Mantharai, Magizha Maram, Vila Maram, Poo Marudhu, Panai, Marudha maram, Thandri, Sengondrai, Poovarasu, Thethankottai Maram, Pungam	80%	1500
Total		1500

16. Anticipated Environmental Impacts

16.1 Air Environment and Mitigation Measures

1. Water sprinkling will be done on the roads & unpaved roads.
2. Proper mitigation measures like water sprinkling will be adopted to control dust emissions.
3. Plantation will be carried out on approach roads, solid waste site & nearby mine premises.
4. To control the emissions regular preventive maintenance of equipments will be carried out.

16.2 Noise Environment and Mitigation Measures

1. Periodical monitoring of ambient noise will be done as per CPCB guidelines.
2. No other equipment except the transportation vehicles and excavator for loading will be allowed.
3. Noise generated by these equipments shall be intermittent and does not cause much adverse impact

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17. Responsibilities for Environmental Management Cell (EMC)

The responsibilities of the EMC include the following:

- Environmental Monitoring of the surrounding area
- Developing the green belt/Plantation
- Ensuring minimal use of water
- Proper implementation of pollution control measures

18. Environmental Monitoring Program

A monitoring schedule with respect to Ambient Air Quality, Water & Wastewater Quality, Noise Quality as per Tamil Nadu State Pollution Control Board (TNPCB), shall be maintained.

19. Project Cost

The total project cost is **Rs 1,28,68,000/-** for deployment of machinery and creation of infrastructural facilities like approach road, mine office / Workers Shed, First Aid Room etc., including electrifications and water supply.

Table .12 Project Cost details

S. No.	Description	Cost (Rs.)
1	Investment Cost	10,00,000/-
2	Mining Cost	1,18,68,000 /-
	Total	1,28,68,000/-

Total Environmental Management Plan Cost – Rs. 71,73,504 /-

(Seventy-one lakh seventy-three thousand five hundred and four rupees only) for 5 years.

20. Corporate Environmental Responsibility

The Corporate Environment Responsibility (CER) fund will be provided to the below activity.

Table 13 CER Cost

<i>Project</i>	<i>Rough stone and Gravel Quarry- 3.01.00 Ha</i>	<i>Draft EIA Report</i>
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<i>Project Location</i>	<i>Anaikulam Village, Veerakeralampudur Taluk, Tenkasi District</i>	

S.No.	CER Activity	CER value (Rs)
1.	Panchayat Union Primary School, Anaikulam, Kadayanallur Union – 627 859, Provision of ❖ LCD Smart Board and ❖ Amenities such as Environmental awareness books (Tamil) in Library for students, Green Belt development, Drinking water facility, Hygienic Toilet and maintenance of toilet upto lease period.	5,00,000
Total		5,00,000

21. Benefits of the Project

- There is a positive impact on socioeconomics of people living in the villages. Mining operations in the subject area has positive impact by providing direct and indirect jobs opportunities.
- The project is environmentally compatible, financially viable and would be in the interest of construction industry thereby indirectly benefiting the masses.
- Quarrying in this area is not going to have any negative impact on the social or cultural life of the villagers in the near vicinity.

<i>Project</i>	<i>Rough stone and Gravel Quarry- 3.01.00 Ha</i>	<i>Draft EIA Report</i>
<i>Project Proponent</i>	<i>Thiru.N.H.M. Pandian</i>	
<i>Project Location</i>	<i>Anaikulam Village, Veerakeralampudur Taluk, Tenkasi District</i>	

1 Introduction

1.1 PREAMBLE

Environment Impact Assessment (EIA) is a process used to identify the environmental, social & economic impacts of a project prior to decision making. It aims to predict 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 prediction options to the proponent. By using EIA, both environmental & economic benefits can be achieved. By considering environmental effects - prediction & mitigation, early benefits in project planning, protection of the environment, optimum utilization of resources, thus saving overall time & cost of the project.

1.2 GENERAL INFORMATION ON MINING OF MINERALS

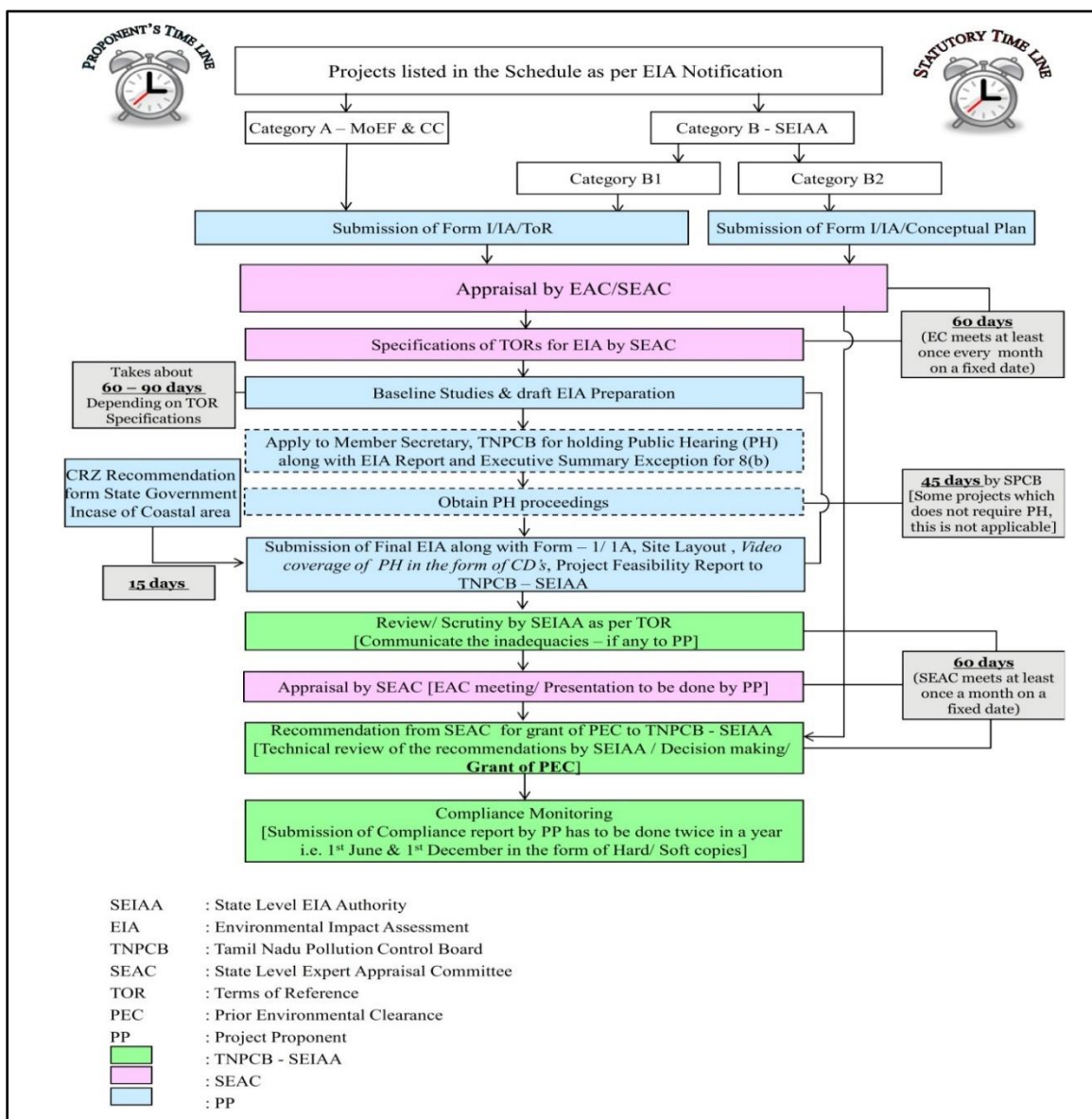
Mining activities based on rough stone (mostly charnockite) are majorly concentrated in Alangulam, Radhapuram, Nanguneri, Manur and Sankarankovil Taluks in the district under operation for production of construction materials and earth fill as gravel. Rough stone (mostly charnockite and Hbl-bt gneiss) are majorly concentrated in Alangulam, Radhapuram, Nanguneri, Manur and Sankarankovil Taluks in the district.

1.3 ENVIRONMENTAL CLEARANCE

As per EIA Notification, 2006 and its subsequent amendments (O.M vide No.F.No.L-11011/175/2018-IA-II(M) Govt of India MOEF&CC on December 12th 2018) project comes under category B1 cluster & schedule 1(a) under item 1

The proposed project is categorized under Category “B1” 1(a) (Cluster) - {Mining of Minerals} as the 500m radius area is more than 5 Ha including the mine lease area. Hence, the project will be considered at SEAC, Tamil Nadu.

Project	Rough stone and Gravel Quarry- 3.01.00 Ha	Draft EIA Report
Project Proponent	Thiru.N.H.M. Pandian	
Project Location	Anaikulam Village, Veerakeralampudur Taluk, Tenkasi District	



1.4 TERMS OF REFERENCE (TOR)

The Terms of Reference have been issued by SEAC TN vide Letter No. SEIAA-TN/F.No.10299/SEAC/ToR-1644/2024 Dated: 09.01.2024. 43 additional ToR points were recommended by SEAC TN in addition to the Standard ToR Points. The replies for the same were addressed in this report.

<i>Project</i>	<i>Rough stone and Gravel Quarry- 3.01.00 Ha</i>	<i>Draft EIA Report</i>
<i>Project Proponent</i>	<i>Thiru.N.H.M. Pandian</i>	
<i>Project Location</i>	<i>Anaikulam Village, Veerakeralampudur Taluk, Tenkasi District</i>	

1.5 POST ENVIRONMENTAL CLEARANCE MONITORING

1.5.1 Methodology adopted

Post project monitoring will be carried out as per conditions stipulated in environmental clearance letter issued by SEIAA, consent issued by SPCB as well as according to CPCB guidelines. The lease area is considered as core zone and the area lying within 10 km radius from the lease boundary is considered as buffer zone, where some impacts may be observed on physical and biological environment. In the buffer zone slight impact may be observed and that too is occasional.

Table 1-1: Post Environmental Clearance Monitoring

S. No.	Description	Frequency of Monitoring
1.	Ambient Air Quality Monitoring	Quarterly/ Half Yearly
2.	Water level & Quality Monitoring	Quarterly/ Half Yearly
3.	Noise Level Monitoring	Quarterly/ Half Yearly
4.	Soil Quality Monitoring	Yearly
5.	Medical Check-up	Yearly

1.6 GENERIC STRUCTURE OF THE EIA DOCUMENT

Chapter 1: Introduction. This chapter contains the general information on the mining of minerals, major sources of environmental impacts in respect of mining projects and details of environmental clearance process.

Chapter 2: Project Description. In this chapter the proponent should also furnish detailed description of the proposed project, such as the type of the project, need for the project, project location, layout, project activities during construction and operational 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. If the project site is near a sensitive area it is to be mentioned clearly why an alternative site could not be considered. The project implementation schedule estimated cost of development as well as operation etc should be also included.

Chapter 3: Analysis of Alternatives (Technology and Site). This chapter gives details of various alternatives both in respect of location of site and technologies to be deployed, in case the initial scoping exercise considers such a need.

Project	<i>Rough stone and Gravel Quarry- 3.01.00 Ha</i>	<i>Draft EIA Report</i>
Project Proponent	<i>Thiru.N.H.M. Pandian</i>	
Project Location	<i>Anaikulam Village, Veerakeralampudur Taluk, Tenkasi District</i>	

Chapter 4: Description of Environment. This chapter should cover baseline data in the project area and study area.

Chapter 5: Impact Analysis and mitigation measures. This chapter describes the anticipated impacts on the environment and 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. It should give the details of the impacts on the baseline parameters, both during the construction and operational phases and suggests the mitigation measures to be implemented by the proponent.

Chapter 6: Environmental Monitoring Program. This chapter should cover the planned environmental monitoring program. It should also include the technical aspects of monitoring the effectiveness of mitigation measures.

Chapter 7: Additional Studies. This chapter should cover the details of the additional studies required in addition to those specified in the ToR and which are necessary to cater to more specific issues applicable to the particular project.

Chapter 8: Project Benefits. This chapter should cover the benefits accruing to the locality, neighborhood, region and nation as a whole. It should bring out details of benefits by way of improvements in the physical infrastructure, social infrastructure, employment potential and other tangible benefits.

Chapter 9: Environmental Cost Benefit Analysis. This chapter should cover on Environmental Cost Benefit Analysis of the project.

Chapter 10: Environmental Management Plan. This chapter should comprehensively present the Environmental Management Plan (EMP), which includes the administrative and technical setup, summary matrix of EMP, the cost involved to implement the EMP, both during the construction and operational phase and provisions made towards the same in the cost estimates of project construction and operation. This chapter should also describe the proposed post-monitoring scheme as well as inter-organizational arrangements for effective implementation of the mitigation measures.

Chapter 11: Summary and Conclusions. This chapter gives the summary of the full EIA report condensed to ten A-4 size pages at the maximum. It should provide the overall justification for implementation of the project and should explain how the adverse effects have been mitigated.

Project	<i>Rough stone and Gravel Quarry- 3.01.00 Ha</i>	<i>Draft EIA Report</i>
Project Proponent	<i>Thiru.N.H.M. Pandian</i>	
Project Location	<i>Anaikulam Village, Veerakeralampudur Taluk, Tenkasi District</i>	

Chapter 12: Disclosure of Consultants. This chapter should include the names of the consultants engaged with their brief resume and nature of consultancy rendered.

1.7 DETAILS OF PROJECT PROPONENT

Project Proponent : Thiru.N.H.M.Pandian
Status of the Proponent : Individual
Proponent's Name & Address : S/o.Navaneethakrishna Pandian,
D.No.4/7, Kurunthan Mozhi,
Kuruchampatti Post, Veerakeralampudur Taluk.,
Tenkasi District - 627 860.

1.8 BRIEF DESCRIPTION OF THE PROJECT

1.8.1 Project Nature, Size & Location

As per EIA Notification, 2006 and its subsequent amendments (O.M vide No.F.No. L-11011/175/2018-IA-II(M) Government of India MoEF & CC on December 12th, 2018) project comes under category B1 cluster & schedule 1(a) under item 1.

Proposed proposal pertains to Rough stone and Gravel mining project by open cast mechanized method on allotted mine lease area at Anaikulam Village, Veerakeralampudur Taluk of Tenkasi District, Tamil Nadu. It is a plain terrain topography. The total allotted mine lease for the proposed project is 3.01.00 Ha with their maximum production capacity i.e. 303165 m³ of Rough stone and 65397 m³ of Gravel for the period of Five years only.

Project	Rough stone and Gravel Quarry- 3.01.00 Ha	Draft EIA Report
Project Proponent	Thiru.N.H.M. Pandian	
Project Location	Anaikulam Village, Veerakeralampudur Taluk, Tenkasi District	

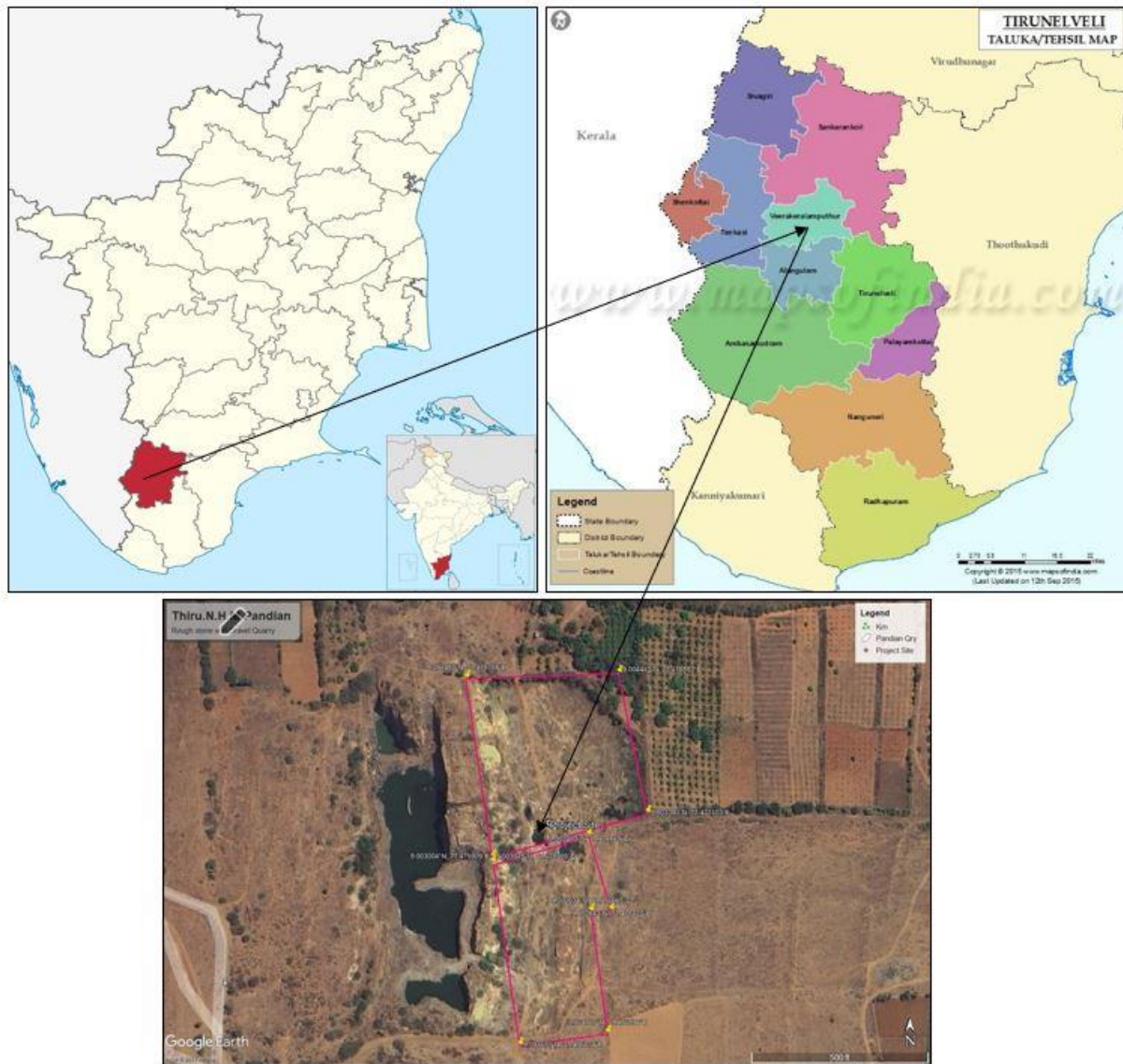


Figure 1.1: Location Map of the Project site

<i>Project</i>	<i>Rough stone and Gravel Quarry - 3.01.00 Ha</i>	<i>Draft EIA Report</i>
<i>Project Proponent</i>	<i>Thiru.N.H.M.Pandian</i>	
<i>Project Location</i>	<i>Anaikulam Village, Veerakeralampudur Taluk, Tenkasi District</i>	

2 Project Description

This chapter furnishes detailed description of the proposed project, such as the type of the project, need for the project, project location, layout, project activities during mining, 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. The project implementation schedule estimated cost for carrying out entire mining activity is included.

2.1 GENERAL

Proposed proposal pertains to Rough stone, Jelly and Gravel mining project by open cast mechanized method on allotted mine lease area at Anaikulam Village, Veerakeralampudur Taluk of Tenkasi District, Tamil Nadu. It is a plain terrain topography. We have obtained fresh mining plan from 2024 to 2029 from Department of Geology and Mining, Tenkasi District for 3.01.00 Ha land area in the S.F.Nos. 302/1 (1.70.50Ha.), 304/1A (0.54.00Ha.) & 304/2A (0.76.50Ha.) for a proposed mining depth of 49 m below ground level and five years production of 303165 m³ of Rough stone and 65397 m³ of Gravel.

Type of the project:

As per EIA Notification, 2006 and its subsequent amendments (O.M vide No.F.No.L-11011/175/2018-IA-II(M) Government of India MoEF & CC on December 12th, 2018) project comes under category B1 cluster & schedule 1(a) under item 1. The project required to be appraised at state level by State Environment Impact Assessment Authority, Tamil Nadu. Environment Clearance study will involve preparation of draft EIA report on the basis of baseline & impact assessment study is carried out. Also, before appraisal, under 7(III) of EIA notification 2006, the project involves the Public Consultation and the same will be conducted under SPCB (TN) in Virudhunagar District. The proceedings of the same will be incorporated in the Final EIA Report.

The mines within 500m radius from the project site is listed below.

Project	Rough stone and Gravel Quarry - 3.01.00 Ha	Draft EIA Report
Project Proponent	Thiru.N.H.M.Pandian	
Project Location	Anaikulam Village, Veerakeralampudur Taluk, Tenkasi District	

Table 2-1: Quarry within 500m Radius

S. No.	Name of the Lessee	Village & S.F.No.	Extent - Hects	Lease Status
a. Details of abandoned quarries:				
..... Nil.....				
b. Details of Expired quarries				
..... Nil.....				
c. Details of Existing Quarries				
1.	Thiru.M.Abdul Ali, S/o.Mohammed Sharffudhin, No.8, Moonusuzhi road, Vadakarai village, Shenkottai Taluk, Tenkasi District.	S.F.Nos: 1,2,11/2 & 12, Surandai Part-I (V)	4.00.0	27.03.2023 to 26.03.2024
2	Thiru.D.Sankaranarayanan, S/o. Durairaj, 9-7-7/1, Bus stand Road, Surandai, Veerakeralampudur, Tenkasi Taluk and District.	S.F. Nos: 279/3A (P) & 279/4 (P)	0.98.50	10.10.2022 to 09.10.2027
d. Present Proposed Quarries				
1.	N.H.M. Pandian, S/o. Navaneethakrishna Pandian, 4/7, Kuruthanmozhi, Kuruchampatti Post, V.K.Pudur Taluk, Tenkasi District.	S.F.Nos: 302/1, 304/1A & 304/2A Anaikulam Village	3.01.0	Instant Proposal
Total cluster area			7.99.5 Ha	

Project	Rough stone and Gravel Quarry - 3.01.00 Ha	Draft EIA Report
Project Proponent	Thiru.N.H.M.Pandian	
Project Location	Anaikulam Village, Veerakeralampudur Taluk, Tenkasi District	

2.1.1 Need for the project:

The said project plays a significant role in the domestic as well as infrastructural market. To achieve a huge infrastructure being envisaged by Government of India, particularly in road and housing sector, there is a need for basic building materials, the rough stone form the primary building material.

Rough stone is one of the most valuable natural building materials. Aggregates are mostly used for building roads and footpaths. Aggregates – stone used for its strong physical properties – crushed and sorted into various sizes for use in concrete, coated with bitumen to make asphalt or used 'dry' as bulk fill in construction.

Mostly used in roads, concrete and building products. Aggregates represent about 98% of quarry output, most of which is used in road construction, maintenance and repair. Much of this goes to the production of asphalt; the remainder is used 'dry' without the addition of other materials to provide a sturdy base for roads.

2.2 BRIEF DESCRIPTION OF THE PROJECT

Table 2-2 Salient Features of the Project

S. No.	Description	Details
1	Project Name	Thiru.N.H.M.Pandian Rough Stone and Gravel Quarry
2	Proponent	Thiru.N.H.M.Pandian
3	Mining Lease Area Extent	3.01.00 Ha
4	Location	Anaikulam Village, Veerakeralampudur Taluk, Tenkasi District`
5	Latitude	09°00' 05.83" to 09°00' 16.00" N
6	Longitude	77°28' 32.52" to 77°28' 37.57" E
7	Topography	Plain Terrain
8	Site Elevation above MSL	194.0m above MSL.
9	Topo sheet No.	58 - G/08 of Survey of India
10	Minerals of Mine	Rough Stone and Gravel Quarry
11	Proposed production of Mine	303165 m ³ of Rough stone & 65397 m ³ of Gravel

Project	Rough stone and Gravel Quarry - 3.01.00 Ha	Draft EIA Report
Project Proponent	Thiru.N.H.M.Pandian	
Project Location	Anaikulam Village, Veerakeralampudur Taluk, Tenkasi District	

12	Ultimate depth of Mining	49.0 m below ground level
13	Method of Mining	Open cast mechanized mining
14	Water demand	6.0 KLD
15	Source of water	Water will be supplied through tankers supply
16	Man power	11 Nos.
17	Mining Plan Approval	Mining Plan was approved by the Joint Director/Assistant Director (i/c), Tenkasi vide letter Rc.No.M1/14953/2019 Dated 21.06.2023
18	Precise area communication letter	Precise Area Communication Letter received from Joint Director/Assistant Director (i/c), Tenkasi vide letter Rc.No.M1/14953/2019 Dated 18.05.2023.
19	Production details	Geological reserves: 1402830 m ³ of Rough stone and 103341 m ³ of Gravel Proposed year wise reserves: 303165 m ³ of Rough stone and 65397 m ³ of Gravel
20	Boundary Fencing	7.5 m barrier all along the boundary for adjacent patta lands and 10 m safety distance for Govt. Lands. Fencing will be provided.
21	Disposal of overburden	The overburden is in the form of topsoil and weathered rock formation. It will be quarried for filling purposes to nearby end users and part of soil will be preserved all along the boundary as barrier for afforestation.
22	Ground water	The water table is below 65 mts from ground level which is observed from the nearby bore wells and the data obtained from existing panchayat and Private borewells. The quarry operation is proposed up to a depth of 49.0mts below the ground level.
23	Habitations within 300m radius of the Project Site	There is no Habitation within 300m radius of the project site.
24	Drinking water	Water will be supplied through tankers from Anaikulam village which is about 2.43 km W from the project site.

Project	Rough stone and Gravel Quarry - 3.01.00 Ha	Draft EIA Report
Project Proponent	Thiru.N.H.M.Pandian	
Project Location	Anaikulam Village, Veerakeralampudur Taluk, Tenkasi District	

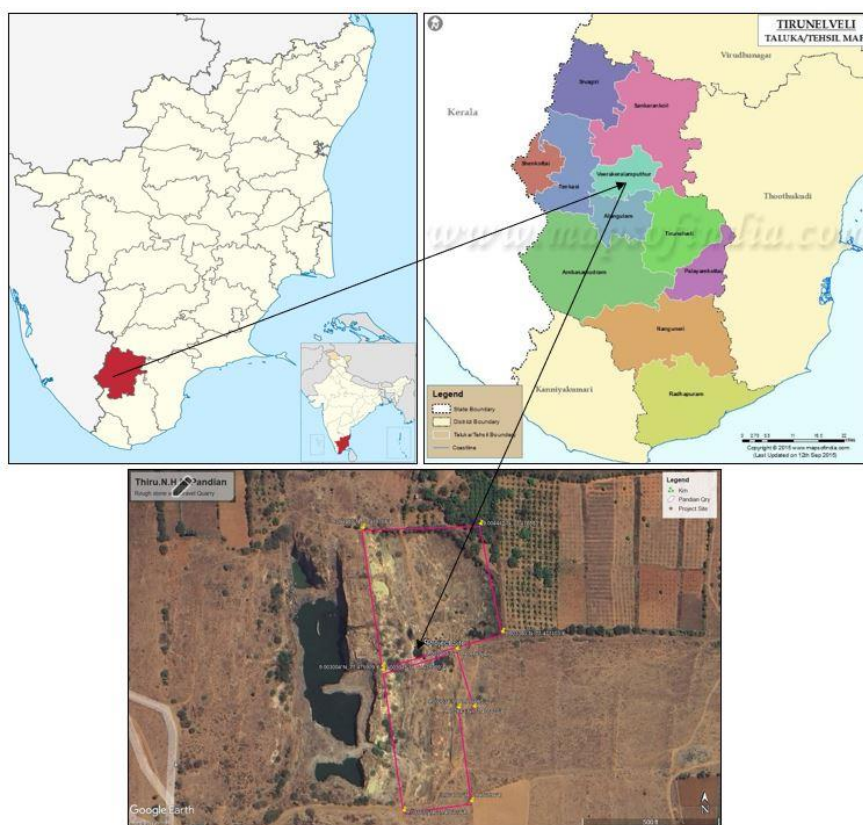


Figure 2.1: Location Map of the Project Site



Figure 2.2: Google Earth Image and Coordinates of the Project Site

Project	Rough stone and Gravel Quarry - 3.01.00 Ha	Draft EIA Report
Project Proponent	Thiru.N.H.M.Pandian	
Project Location	Anaikulam Village, Veerakeralampudur Taluk, Tenkasi District	

2.2.1 Site Connectivity:

The site is connected to the roadways as follows.

Village Road – Mariyathaipuram Village road.



Figure 2.3: Site Connectivity

2.3 LOCATION DETAILS:

Table 2-3: Location Details

S. No	Particulars	Details
1.	Latitude	09°00' 05.83" to 09°00' 16.00" N
2.	Longitude	77°28' 32.52" to 77°28' 37.57" E
3.	Site Elevation above MSL	194.0m above MSL.
4.	Topography	Plain Topography
5.	Land use of the site	Patta land
6.	Extent of lease area	3.01.00 Ha

Project	Rough stone and Gravel Quarry - 3.01.00 Ha	Draft EIA Report
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Project Location	Anaikulam Village, Veerakeralampudur Taluk, Tenkasi District	

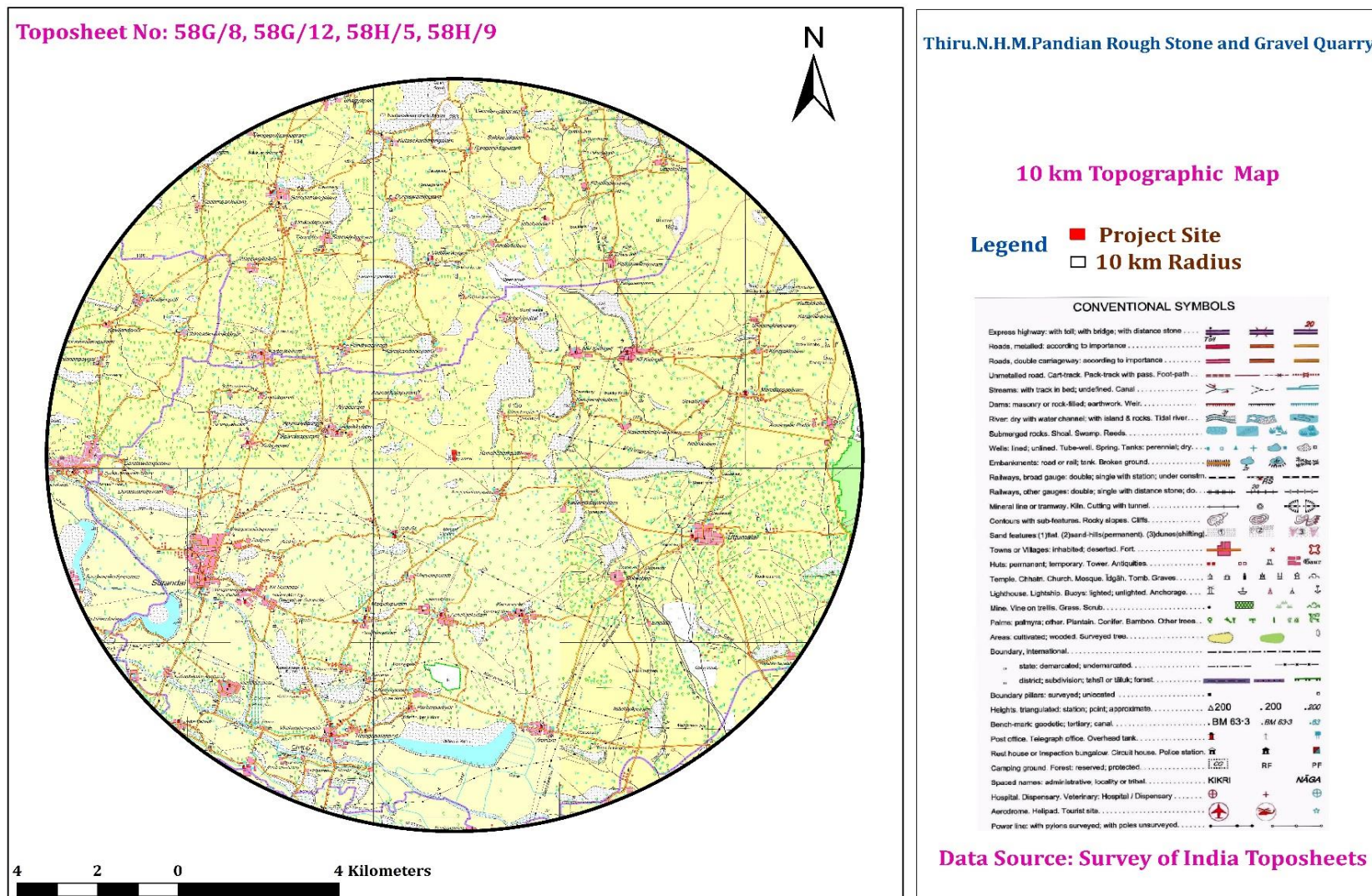


Figure 2.4: Topo Map of Project Site

Project	Rough stone and Gravel Quarry - 3.01.00 Ha	Draft EIA Report
Project Proponent	Thiru.N.H.M.Pandian	
Project Location	Anaikulam Village, Veerakeralampudur Taluk, Tenkasi District	

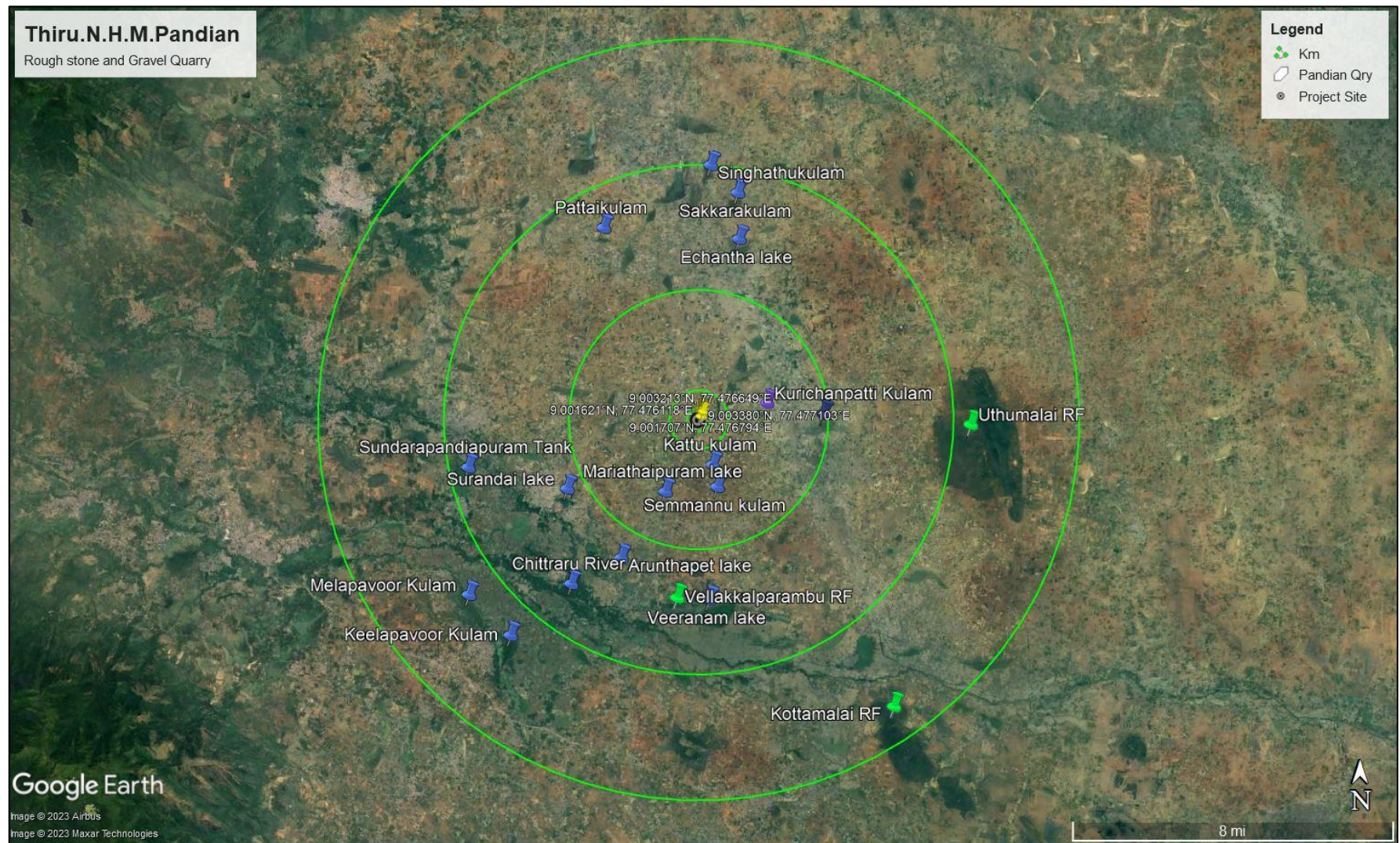


Figure 2.5: Environmental Sensitivity within 15km radius

Project	Rough stone and Gravel Quarry - 3.01.00 Ha	Draft EIA Report
Project Proponent	Thiru.N.H.M.Pandian	
Project Location	Anaikulam Village, Veerakeralampudur Taluk, Tenkasi District	

2.3.1 Land Use Breakup of the Mine Lease Area

The Mine Lease area is plain terrain topography. The land use pattern of the mine lease area as follows.

Table 2-4: Land use pattern

Sl. No.	Land Use	Details
1.	Mining / Excavation at present	0.00.00 Hectares
2.	Storage of topsoil & weathered rock	0.00.00 Hectares
3.	Stocking & Mineral Dressing Yard	0.00.00 Hectares
4.	Infrastructure	0.01.00 Hectares
5.	Mine Road	0.03.00 Hectares
6.	Afforestation & Mine safety	0.82.30 Hectares
7.	Future Mining	2.14.70 Hectares
8.	Undisturbed area	0.00.00 Hectares
Total		3.01.00 Hectares

2.3.2 Human Settlement

There are no habitations within the radius of 300m. The nearby habitations are as follows.

Table 2-5: Habitation

SL. NO.	DIRECTION	VILLAGE	DISTANCE	POPULATION
1	E	Kurichanpatti	1.56 Km	1000
2	W	Anaikulam	2.43 Km	2794
3	NW	Arunachalapuram	1.54 Km	550
4	SE	Karaiyalanur	1.12 Km	600

<i>Project</i>	<i>Rough stone and Gravel Quarry - 3.01.00 Ha</i>	<i>Draft EIA Report</i>
<i>Project Proponent</i>	<i>Thiru.N.H.M.Pandian</i>	
<i>Project Location</i>	<i>Anaikulam Village, Veerakeralampudur Taluk, Tenkasi District</i>	

2.4 LEASEHOLD AREA

The Rough Stone and Gravel Quarry mine of 3.01.00 Ha is a patta land. The lease area falls in S.F.No: 302/1 (1.70.50 Ha.), 304/1A (0.54.00 Ha.) & 304/2A (0.76.50 Ha.) of Anaikulam Village, Veerakeralampudur Taluk, Tenkasi District. There is no reserve forest or protected forest land within the lease area. There is neither human settlement within 300m radius from the lease area.

2.5 GEOLOGY

Southern Granulite Terrain (SGT) of Tamil Nadu lying south of Palghat-Cauvery shear zone has been divided into two major tectonic blocks by the Madurai block and Nagercoil-Trivandrum Block in the south. It is separated by WNW-ESE trending Achankovil-Tambaraparani Lineament. Tirunelveli and Thoothukudi are significantly the only districts in the state to witness the geology and structure of both the blocks. Tirunelveli district represents a well-developed lithopackage of meta-sedimentary sequence inter banded with charnockite Group of rocks. The rock types exposed are of quartzite, calc-granulite, garnet-biotite-sillimanite gneiss, garnet quartzo-feldspathic gneiss and garnetbiotite-cordierite gneiss belonging to Khondalite Group of rock. Charnockite and pyroxene granulite are the Charnockite Group. Hornblende-biotite gneiss belongs to Migmatitic Complex. Besides, basic intrusive (pyroxenite) and acid intrusive (granite) are noticed. The younger intrusive are represented by pegmatite and quartz veins. Evidence of development of incipient / patchy charnockite along the shear plane is noticed in the district along the Western Ghat high hills.

Project	Rough stone and Gravel Quarry - 3.01.00 Ha	Draft EIA Report
Project Proponent	Thiru.N.H.M.Pandian	
Project Location	Anaikulam Village, Veerakeralampudur Taluk, Tenkasi District	

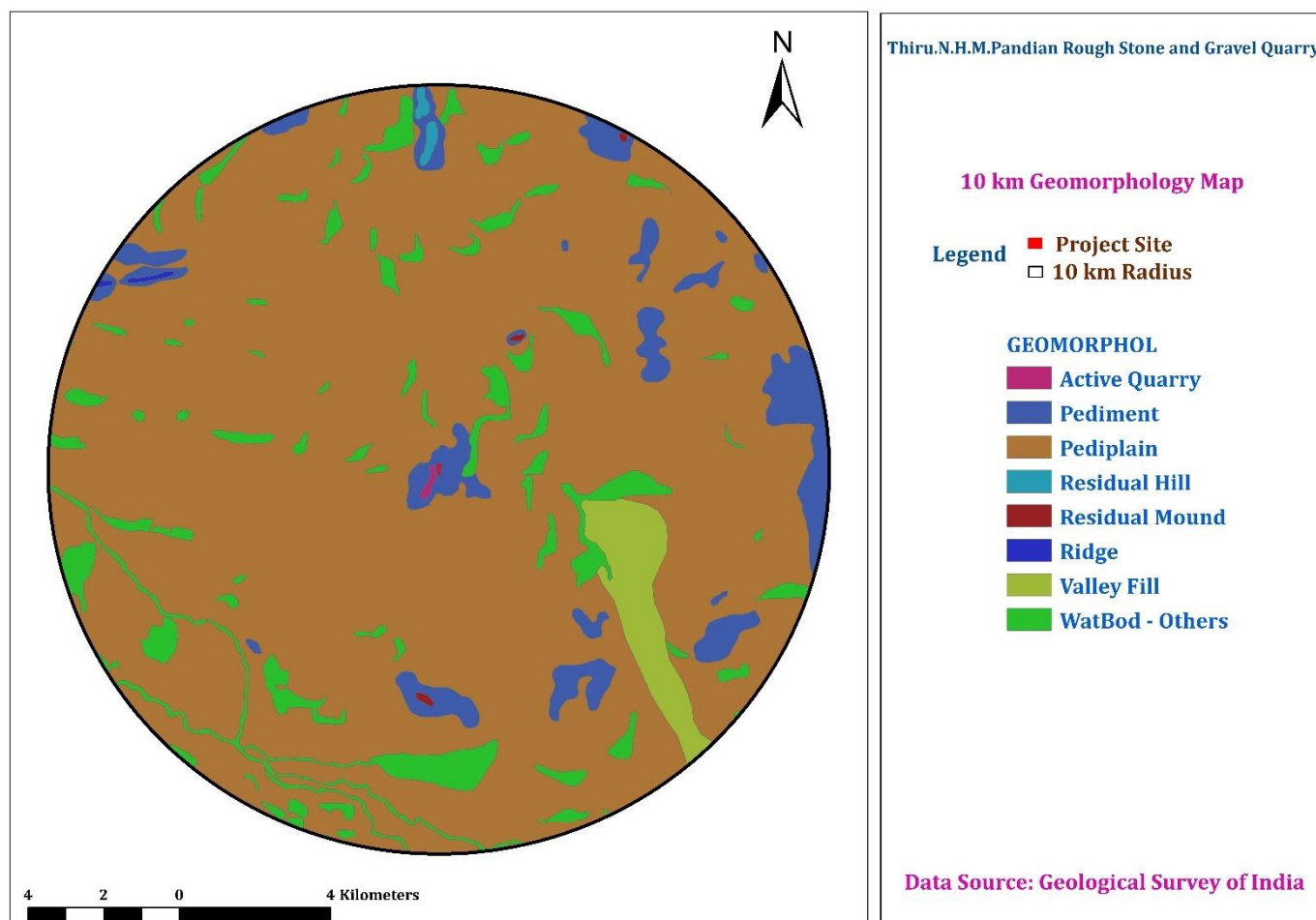


Figure 2.6: Geomorphology

Project	Rough stone and Gravel Quarry - 3.01.00 Ha	Draft EIA Report
Project Proponent	Thiru.N.H.M.Pandian	
Project Location	Anaikulam Village, Veerakeralampudur Taluk, Tenkasi District	

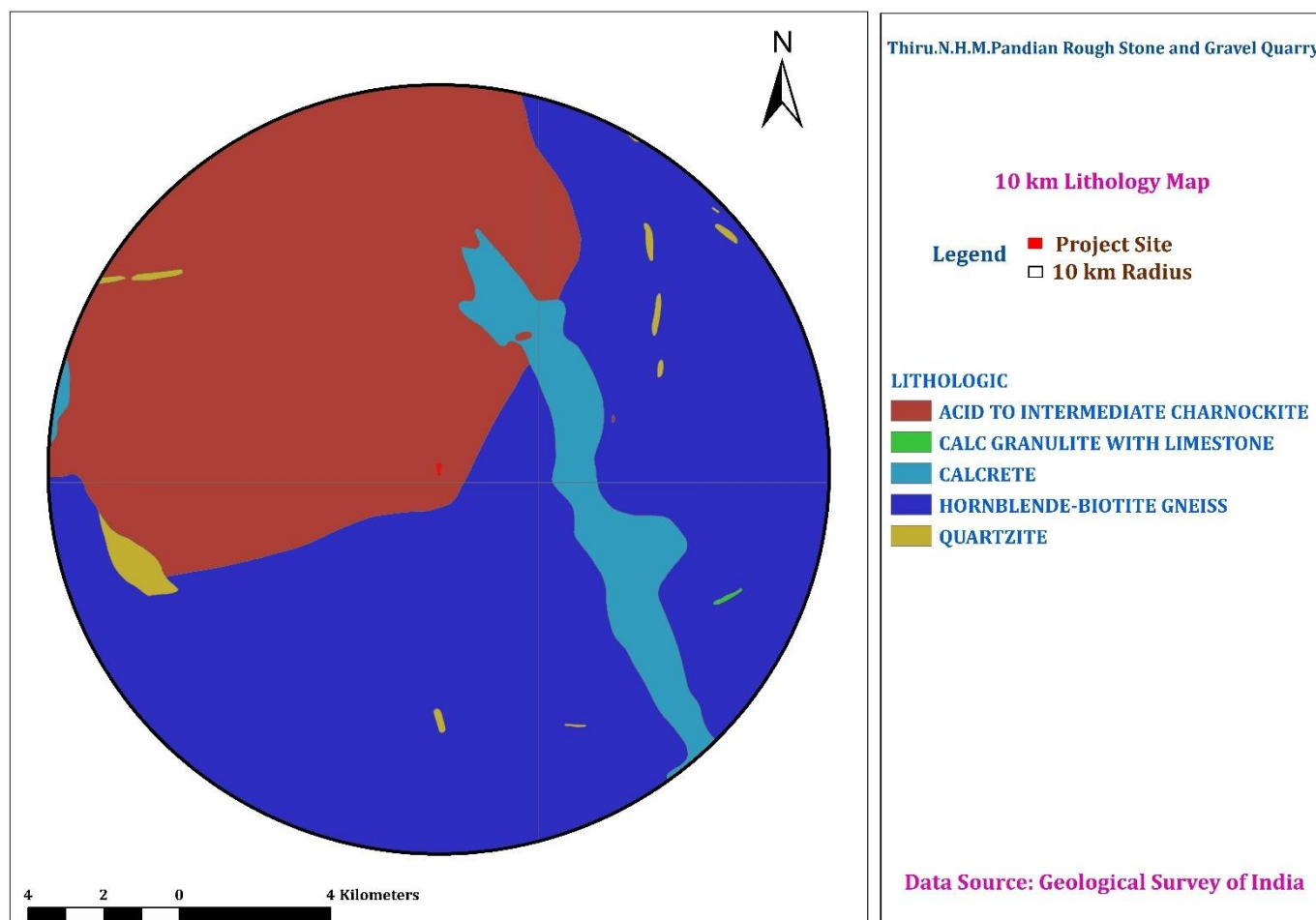


Figure 2.7 Lithology

2.6 QUALITY OF RESERVES:

The mining lease area is 3.01.00 Ha, with production capacity of 303165 m³ of Rough Stone and 65397 m³ of Gravel. Due to its significant role in the domestic as well as infrastructural market, making the mining of Stone and gravel along with associated minor minerals is economically viable.

Table 2-6: Details of Mining

S. No	Particulars	Details
1.	Method of Mining	Open Cast mechanized
2.	Geological Reserves	1402830m ³ of Rough stone and 103341 m ³ of Gravel

Project	Rough stone and Gravel Quarry - 3.01.00 Ha	Draft EIA Report
Project Proponent	Thiru.N.H.M.Pandian	
Project Location	Anaikulam Village, Veerakeralampudur Taluk, Tenkasi District	

3.	Recoverable Reserves	303165m ³ of Rough stone and 65397 m ³ of Gravel
4.	Proposed Production	303165m ³ of Rough stone and 65397 m ³ of Gravel
5.	Elevation Range of the Mine Site	194.0 m MSL

2.6.1 Geological Reserves

The geological reserves have been calculated based on the cross-section method by deducting already excavated in the previous quarry workings and the availability of Geological Resources in this land is given below

Table 2-7: Geological Reserves

SECTION	LENGTH (M)	WIDTH (M)	DEPTH (M)	ROUGH STONE VOLUME M ³	GRAVEL VOLUME M ³
A-A' & B-B'	136	130	4.0	-	70,720
	136	130	45.0	7,95,600	-
A-A' & C-C'	54	91	4.0	-	19,656
	54	91	45.0	2,21,130	-
A-A' & D-D'	110	78	4.0	-	34,320
	110	78	45.0	3,86,100	-
TOTAL GEOLOGICAL RESERVES				14,02,830	1,24,696
Less: Exiting Pit Excavated Already				-	21,355
BALANCE GEOLOGICAL RESERVES				14,02,830	1,03,341

2.6.2 Mineable Reserves

The available mineable reserves are calculated for the proposed lease period of 5 years based on the total minable reserves calculated by deducting 7.5m / 10.0m safety distances to the patta lands / govt. land / odai on along the boundary sides of the applied area, already excavated in the previous quarry workings and Bench losses.

Table 2-8: Mineable Reserves

<i>Project</i>	<i>Rough stone and Gravel Quarry - 3.01.00 Ha</i>	<i>Draft EIA Report</i>
<i>Project Proponent</i>	<i>Thiru.N.H.M.Pandian</i>	
<i>Project Location</i>	<i>Anaikulam Village, Veerakeralampudur Taluk, Tenkasi District</i>	

SECTION	LENGTH (M)	WIDTH (M)	HEIGHT (M)	ROUGH STONE VOLUME (M ³)	GRAVEL VOLUME(M ³)
A-A' & B-B'	117	111	4.0	-	51,948
	107	101	5.0	54,035	-
	97	91	5.0	44,135	-
	87	81	5.0	35,235	-
	77	71	5.0	27,335	-
	67	61	5.0	20,435	-
	57	51	5.0	14,535	-
	47	41	5.0	9,635	-
	37	31	5.0	5,735	-
	27	21	5.0	2,835	-
A-A' & C-C'	43	72	4.0	-	12,384
	38	62	5.0	11,780	-
	33	52	5.0	8,580	-
	28	42	5.0	5,880	-
	23	32	5.0	3,680	-
	18	22	5.0	1,980	-
A-A' & D-D'	95	59	4.0	-	22,420
	90	49	5.0	22,050	-
	85	39	5.0	16,575	-
	80	29	5.0	11,600	-
	75	19	5.0	7,125	-
TOTAL MINEABLE RESERVES				3,03,165	86,752
Less: Existing Pit- Already Excavated				-	21,355
BALANCE MINEABLE RESERVES				3,03,165	65,397

The Available mineable reserve is computed as 303165 m³ of rough stone and 65397 m³ of Gravel up to a depth of 49.0 m below ground level only.

Project	Rough stone and Gravel Quarry - 3.01.00 Ha	Draft EIA Report
Project Proponent	Thiru.N.H.M.Pandian	
Project Location	Anaikulam Village, Veerakeralampudur Taluk, Tenkasi District	

2.6.3 Year wise Production Plan

The applicant has proposed to carry out 303165 m³ of Rough stone and 65397 m³ of Gravel at the rate of 100% recovery up to a depth of 49.0 m below ground level for the period of five years only.

Table 2-9: Year wise Production Plan

SECTION	YEAR	LENGTH (M)	WIDTH (M)	HEIGHT (M)	ROUGH STONE VOLUME (M³)	GRAVEL VOLUME (M³)
A-A' & B-B'	I-Year	58	111	4.0	-	25,752
		48	101	5.0	24,240	-
		38	91	5.0	17,290	-
		28	81	5.0	11,340	-
		18	71	5.0	6,390	-
Less Gravel pit A-A' & B-B'		SUB-TOTAL			59,260	25,752
58		111	1.0	-	(-)6,438	
I – YEAR PRODUCTION					59,260	19,314
A-A' & B-B'	II- Year	29	111	4.0	-	12,876
		29	101	5.0	14,645	-
		29	91	5.0	13,195	-
		29	81	5.0	11,745	-
		29	71	5.0	10,295	-
		37	61	5.0	11,285	-
Less Gravel pit A-A' & B-B'		SUB-TOTAL			61,165	12,876
29		111	1.0	-	(-)3,219	
II – YEAR PRODUCTION					61,165	9,657
A-A' & B-B'	III- Year	30	111	4.0	-	13,320
		30	101	5.0	15,150	-
		30	91	5.0	13,650	-

<i>Project</i>	<i>Rough stone and Gravel Quarry - 3.01.00 Ha</i>	<i>Draft EIA Report</i>
<i>Project Proponent</i>	<i>Thiru.N.H.M.Pandian</i>	
<i>Project Location</i>	<i>Anaikulam Village, Veerakeralampudur Taluk, Tenkasi District</i>	

		30	81	5.0	12,150	-
		30	71	5.0	10,650	-
		30	61	5.0	9,150	-
Less Gravel		SUB-TOTAL			60,750	13,320
pit		30	111	1.0	-	(-)3,330
A-A' & B-B'		54	12	1.0	-	(-)648
III – YEAR PRODUCTION					60,750	9,342
A-A' & C-C'		43	72	4.0	-	12,384
		38	62	5.0	11,780	-
		33	52	5.0	8,580	-
A-A' & D-D'	IV- YEAR	95	59	4.0	-	22,420
		90	49	5.0	22,050	-
		85	39	5.0	16,575	-
Less Gravel		SUB-TOTAL			58,985	34,804
pit		140	54	1.0	-	(-)7,560
A-A' & C-C'		16	10	1.0	-	(-)160
A-A' & D-D'						
IV – YEAR PRODUCTION					58,985	27,084
A-A' & C-C'		28	42	5.0	5,880	-
		23	32	5.0	3,680	-
		18	22	5.0	1,980	-
A-A' & D-D'	V- YEAR	80	29	5.0	11,600	-
		75	19	5.0	7,125	-
A-A' & B-B'		57	51	5.0	14,535	-
		47	41	5.0	9,635	-
		37	31	5.0	5,735	-
		27	21	5.0	2,835	-
V – YEAR PRODUCTION					63,005	-
TOTAL PRODUCTION FOR FIVE YEARS					3,03,165	65,397

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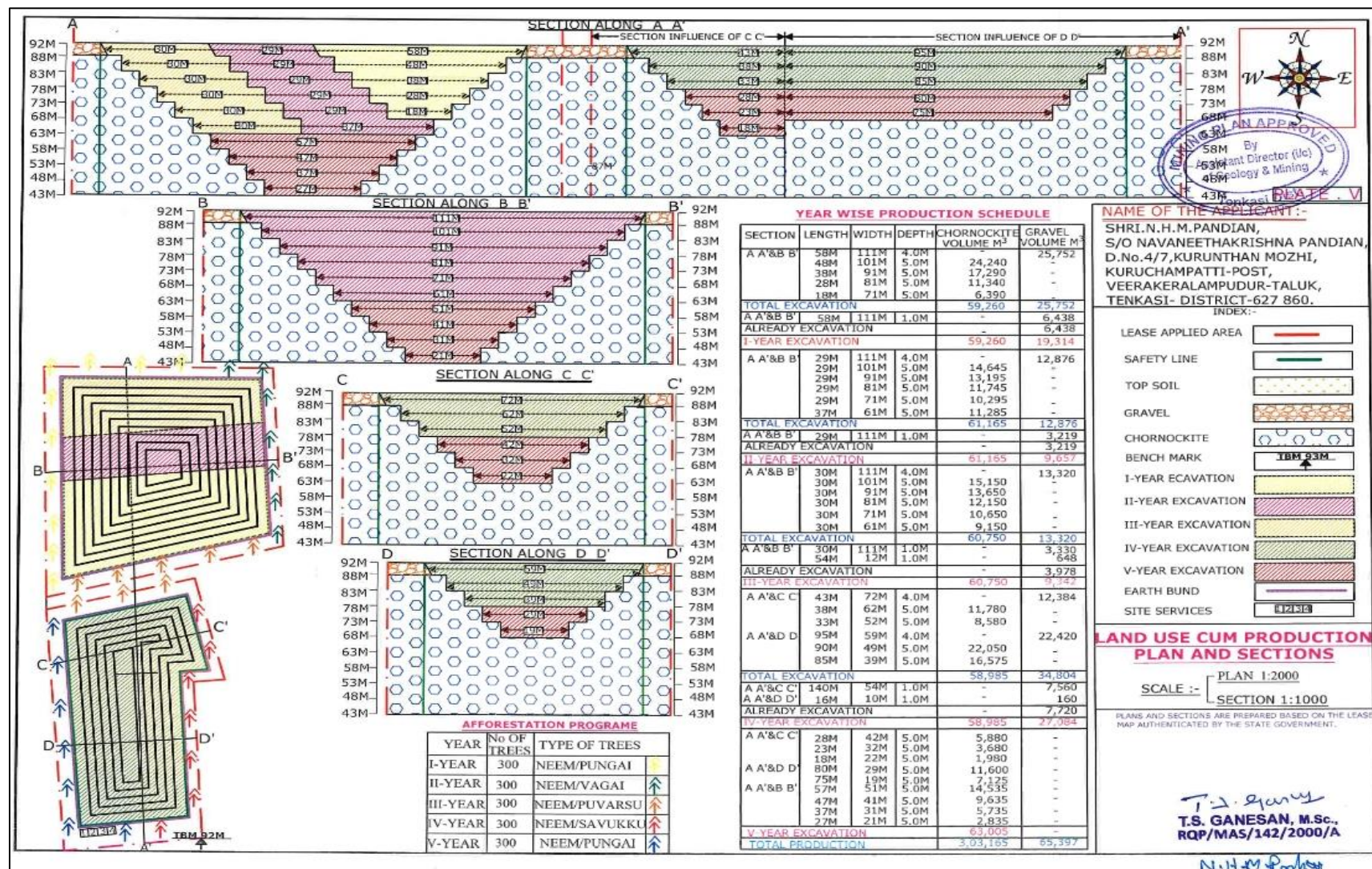


Figure 2.8 Year wise Production Plan

<i>Project</i>	<i>Rough stone and Gravel Quarry - 3.01.00 Ha</i>	<i>Draft EIA Report</i>
<i>Project Proponent</i>	<i>Thiru.N.H.M.Pandian</i>	
<i>Project Location</i>	<i>Anaikulam Village, Veerakeralampudur Taluk, Tenkasi District</i>	

2.7 TYPE OF MINING

The proposed project is an open cast mechanized mining with one with 5.0 meter vertical bench with a bench width of 5.0 meter. However, as far as the quarrying of Rough Stone is concerned, observance of the provisions of regulations 106(2) (b) as above is seldom possible due to various inherent petro genetic factors coupled with mining difficulties. Hence, it is proposed to obtain relaxation to the provisions of the above regulation from the Director of Mines Safety for which necessary provision is available with the Regulation 106(2) (b) of MMR-1961, under Mines Act- 1952.

2.7.1 *Method of Working:*

The Rough stone and Gravel Quarry is proposed to quarry at 5m bench height & 5m width with conventional Open cast mechanized method. The quarrying operation will be carried out in conjunction with conventional method of mining using Jack hammer drilling and blasting for shattering effect and loosen the Rough stone and Gravel Quarry.

2.7.2 *Overburden*

The overburden is in the form of Gravel formation, it has been removed earlier quarry operation. The excavated rough stone will be directly loaded into tipper to the needy crushers/ other buyers for road project and construction works for filling and levelling of low-lying areas.

2.7.3 *Machineries to be used*

Type of machineries proposed for quarrying operation for the entire project is listed below.

Table 2-10: List of Machineries used

For Mining operation	Excavator of 0.90 Cu.m bucket capacity Jack Hammer (30-32 mm dia) Tractor mounted compressor
Loading Equipment	Excavator of 0.9 Cu.m bucket capacity
Transportation	Tipper 5 No. of 5/10 Tons capacity

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<i>Project Location</i>	<i>Anaikulam Village, Veerakeralampudur Taluk, Tenkasi District</i>	

2.7.4 *Blasting:*

2.7.4.1 **Blasting Pattern:**

The quarrying operation will be carried out in conjunction with conventional method of mining using Jack hammer drilling and blasting for shattering effect and loosen the Rough stone.

2.7.4.2 **Drilling & Blasting:**

Drilling and Blasting Parameters are as follows.

Table 2-11: Drilling and Blasting Parameters

1	Diameter of the hole	32-36 mm
2	Spacing	0.5m
3	Depth of each hole	1.2 to 1.5 m
4	Burden per hole	0.5m
5	Inclination of hole	80° from the horizontal.
6	Use of delay detonators	25 millisecond delays
7	Detonating fuse	NONEL "Detonating" Cord
8	Blasting Design	Zig Zag - Staggered in 2 to 3 rows

2.7.4.3 **Types of Explosives to be used:**

Slurry Class 3 explosives, type of nitro compound are proposed to be used for shattering and heaving effect for removal and winning of Rough Stone. No deep hole drilling or primary blasting is proposed. Detonators of Class 3 and Safety fuse of Class 6 are used.

2.7.4.4 **Measures to minimize ground vibration due to blasting:**

The quarry is situated more than 1 km from the nearby villages. Controlled blasting measures will be adopted for minimizing the ground vibration and fly of rocks. Shallow depths jackhammer drilling & blasting is proposed to be carried out with minimum use of explosive mainly to give shattering effect in rough stone for easy excavation and to control fly of rock.

Table 2-12: Blasting Details

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Parameters	Details
Diameter of holes	32-36mm
Spacing between holes	0.5m
Depth	1.2 to 1.5 m
Charge/Hole	Optimized explosive charge
Pattern of hole	Zig Zag - Staggered in 2 to 3 rows
Inclination of Hole	80° from the horizontal
Blasting time	12.00-2.00 PM / 4.30-5.30 PM

2.7.4.5 Storage & Safety measures taken during blasting:

The project proponent “Thiru.N.H.M. Pandian” will engage an authorized explosive agency to carry out the small amount of blasting and it will be supervised by Permit Mines Manager. The copy of the explosive certificate is attached as *Annexure*.

2.8 MAN POWER REQUIREMENTS

The manpower requirement to meet out the production Schedule and the machinery strength envisaged in the mining plan and to comply with the statutory provisions of the Mines Safety Regulations is as follows.

Table 2-13: Man Power Requirements

c. Skilled labour	
Mines Manager	1 No
Mine foreman	1 No
Jack Hammer operator	2 Nos
Blaster / Mate	1 No
d. Unskilled – helpers	6 Nos
Total	11 Nos

No child less than 18 years will be entertained during quarrying operations.

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Project Location	Anaikulam Village, Veerakeralampudur Taluk, Tenkasi District	

2.8.1 Water Requirement

Total water requirement for the mining project is 6.0 KLD. Domestic water will be sourced from nearby Anaikulam village and other water will be source from nearby road tankers supply.

Table 2-14: Water Requirement

Purpose	Quantity	Sources
Drinking Water	1.0KLD	Packaged Drinking water vendors available in Anaikulam village which is about 2.43 km W from the project site.
Green belt	1.5KLD	Other domestic activities through road tankers supply
Dust suppression	3.5KLD	From road tankers supply
Total	6.0 KLD	

2.9 PROJECT IMPLEMENTATION SCHEDULE

The implementation schedule of the proposed Mine Lease of Thiru N.H.M.Pandian (3.01.00 ha) is as follows.

Table 2-15: Mining Schedule

MINING SCHEDULE					
Activity	Jan -25	Jan-26	Jan-27	Jan-28	Jan-29
Site Clearance					
Excavation – Rough stone & Gravel					
I Year Production – Cum – 59260 m ³ Rough Stone & 19314 m ³ Gravel					
II Year Production – Cum – 61165 m ³ Rough Stone & 9657 m ³ Gravel					
III Year Production – Cum – 60750 m ³ Rough Stone & 9342 m ³ of Gravel					
IV Year Production - Cum – 59985 m ³ Rough Stone & 27084 m ³ of Gravel					
V Year Production – Cum – 63005 m ³ Rough Stone					

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Project Location	Anaikulam Village, Veerakeralampudur Taluk, Tenkasi District	

2.10 SOLID WASTE MANAGEMENT

Table 2-15: Solid Waste Management

S.No	Type	Quantity	Disposal Method
1.	Organic	1.98 kg/day	Municipal bin including food waste
2.	Inorganic	2.97 kg/day	TNPCB authorized recycler

As per CPCB guidelines: MSW per capita/day =0.45 kg/day

2.11 MINE DRAINAGE

Depth of water table (based on nearby wells and water bodies)

The water table is below 65 mts from ground level which is observed from the nearby bore wells and the data obtained from existing panchayat and Private borewells. The quarry operation is proposed up to a depth of 49.0mts below the ground level.

2.12 POWER REQUIREMENT

This Rough stone quarry project does not require huge water and electricity for the project.

16 Litre diesel per hour for excavator for mining and loading for Rough Stone needed and **10 Litre** diesel per hour for excavation of Topsoil needed.

2.13 PROJECT COST

S. No.	Description	Cost (Rs.)
1	Investment Cost	10,00,000/-
2	Mining Cost	1,18,68,000 /-
	Total	1,28,68,000/-

One crore twenty eight lakh and sixty eight thousand rupees only

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<i>Project Location</i>	<i>Anaikulam Village, Veerakeralampudur Taluk, Tenkasi District</i>	

I. EMP Cost:

Categories	Mitigation Measure	Provision for Implementation	Capital Cost	Recurring Cost
			(Rs)	
Air Environment	Compaction, gradation and drainage on both sides for Haulage Road	Rental Dozer & drainage construction on haul road @ Rs. 10,000/- per hectare; and yearly maintenance @ Rs. 10,000/- per hectare	30100	30100
	Fixed Water Sprinkling Arrangements + Water sprinkling by own water tankers	Fixed Sprinkler Installation and New Water Tanker Cost for Capital; and Water Sprinkling (thrice a day) Cost for recurring	300000	25000
	Air Quality will be regularly monitored as per norms within ML area & Ambient Area	Yearly Compliance as per CPCB norms	0	40000
	Muffle blasting – To control fly rocks during blasting	Blasting face will be covered with sand bags / steel mesh / old tyres / used conveyor belts	0	0
	Wet drilling procedure / latest eco-friendly drill machine with separate dust extractor unit	Dust extractor @ Rs. 25,000/- per unit deployed as capital & @ Rs. 2500 per unit recurring cost for maintenance	25000	2500
	No overloading of trucks/tippers/tractors	Manual Monitoring through Security guard	0	5000
	Stone carrying trucks will be covered by tarpaulin	Monitoring if trucks will be covered by tarpaulin	0	10000
	Enforcing speed limits of 20 km/hr within ML area	Installation of Speed Governors @ Rs. 5000/- per Tipper/Dumper deployed	5000	0

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	Regular monitoring of exhaust fumes as per RTO norms		0	5000
	Regular sweeping and maintenance of approach roads for at least about 200 m from ML Area	Provision for 2 labours @ Rs.10,000/labour (Contractual) per Hectare	0	60200
	Installing wheel wash system near gate of quarry	Installation + Maintenance + Supervision	30000	10000
Noise Environment	Source of noise will be during operation of transportation vehicles, HEMM for this proper maintenance will be done at regular intervals.	Provision made in Operating Cost	0	0
	Oiling & greasing of Transport vehicles and HEMM at regular interval will be done	Provision made in Operating Cost	0	0
	Adequate silencers will be provided in all the diesel engines of vehicles.	Provision made in Operating Cost	0	0
Noise Environment	It will be ensured that all transportation vehicles carry a fitness certificate.	Provision made in Operating Cost	0	0
	Safety tools and implements that are required will be kept adequately near blasting site at the time of charging.	Provision made in OHS part	0	0
	Ambient Noise will be regularly monitored as per norms within ML area and near Reserve Forest with necessary permission	Yearly compliance as per CPCB Norms	0	0

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	Line Drilling all along the boundary to reduce the PPV from blasting activity and implementing controlled blasting.	Provision made in Operating Cost	0	0
	Proper warning system before blasting will be adopted and clearance of the area before blasting will be ensured.	Blowing Whistle by Mining Mate / Blaster / Competent Person	0	0
	Provision for Portable blaster shed	Installation of Portable blasting shelter	30000	2000
	NONEL Blasting will be practiced to control Ground vibration and fly rocks	Rs. 30/- per 6 Tonnes of Blasted Material	0	100000
Water Environment	Water Environment	Provision for garland drain @ Rs. 10,000/- per Hectare with maintenance of Rs. 5,000/- per annum	22300	5000
Waste Management	Waste management (Spent Oil, Grease etc.,)	Provision for domestic waste collection and disposal through authorized agency	3000	2000
		Installation of dust bins	5000	2000
	Bio toilets will be made available outside mine lease on the land of owner itself	Provision made in Operating Cost	0	0
Implementation of EC, Mining Plan & DGMS Condition	Size 6' X 5' with blue background and white letters as mentioned in MoM Appendix II by the SEAC TN	Fixed Display Board at the Quarry Entrance as permanent structure mentioning Environmental Conditions	7000	1000

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	Workers will be provided with Personal Protective Equipment's	Provision of PPE @ Rs. 4000/- per employee with recurring based on wear and tear (say, @ Rs. 1000/- per employee)	44000	11000
Implementation of EC, Mining Plan & DGMS Condition	Health checkup for workers will be provisioned	IME & PME Health checkup @ Rs. 1000/- per employee	0	11000
	First aid facility will be provided	Provision of 2 Kits per Hectare @ Rs. 2000/-	0	6020
	Mine will have safety precaution measures, signages, boards.	Provision for signages and boards made	10000	2000
	Barbed Wire Fencing to quarry area will be provisioned.	Per Hectare fencing Cost @ Rs. 2,00,000/- with Maintenance of Rs 10,000/- per annum	602000	10000
Implementation of EC, Mining Plan & DGMS Condition	No parking will be provided on the transport routes. Separate provision on the south side of the hill will be made for vehicles /HEMMs. Flaggers will be deployed for traffic management	Parking area with shelter and flags @ Rs. 50,000/- per hectare project and Rs. 10,000/- as maintenance cost	150500	10000
	Installation of CCTV cameras in the mines and mine entrance	Camera 4 Nos, DVR, Monitor with internet facility	20000	5000
	Implementation as per Mining Plan and ensure safe quarry working	Mines Manager (1st Class / 2nd Class / Mine Foreman) under regulation 34 / 34 (6) of MMR, 1961 and Mining Mate under regulation 116 of MMR,1961 @ 40,000/-	0	540000

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		for Manager & @ 25,000/- for Foreman / Mate		
Greenbelt development	Green belt development - 500 trees per one hectare (200 Inside Lease Area & 300 Outside Lease Area)	Site clearance, preparation of land, digging of pits / trenches, soil amendments, transplantation of saplings @ 200 per plant (capital) for plantation inside the lease area and @ 30 per plant maintenance (recurring)	120400	18060
		Avenue Plantation @ 300 per plant (capital) for plantation outside the lease area and @ 30 per plant maintenance (recurring)	270900	27090
Conducting Slope stability survey cost (The depth of the project beyond 30m)			300000	0
Total			1963000	942970
Total Cost			2905970	

EMP Cost break up for the period of five years has given below.

Year	Cost (@ 5% per year inflation adjustment)
1 st Year	2905970/-
2 nd Year	990119/-
3 rd Year	1039624/-
4 th Year	1091606/-
5 th Year	1146186/-
Total	71,73,504/-

Total Environmental Management Plan Cost – **Rs. 71,73,504/-** (Seventy-one lakh seventy-three thousand five hundred and four rupees only).

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2.14 GREENBELT

1. The development of greenbelt in the peripheral buffer zone of the mine area.
2. Green belt has been recommended as one of the major components of Environmental Management plan, which will improve ecology, environment and quality of the surrounding area.
3. Local trees like, Neem, Vilvam Vaagai, Naval etc will be planted along the lease boundary and avenues as well as over non-active dumps at a rate of 223 trees per annum with interval 5m.
4. The rate of survival expected to be 80% in this area

Table. 2-17 Plantation/ Afforestation Program

Name of species proposed	Survival	No of species
Neem, Vilvam Vaagai, Eachai, Naval, Mantharai, Magizha Maram, Vila maram, Poo Marudhu, Panai Maram, Marudha Maram, Thandri, Sengondrai, Poovarasu, Therthag kottai , Pungam	80%	1500
Total		1500

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3 Description of the Environment

3.1 GENERAL:

The method of mining for extracting rough stone quarry and gravel is required to be selected in such a manner to ensure sustainable development. Mining activities invariably affect the existing environmental status of the site. It has both adverse and beneficial effects. In order to maintain the environmental commensuration with the mining operation, it is essential to undertake studies on the existing environmental scenario and assess the impact on different environmental components. This would help in formulating suitable management plans and sustainable resource extraction.

To understand the existing environmental scenario, Baseline data helps in identification, prediction and evaluation of impacts in Environmental Impact assessment. Through field study, baseline data are collected considering various factors of the project. This includes-

- Physical- the area, the soil properties, the geological characteristics, the topography, etc
- Chemical- water, air, noise and soil pollution levels, etc.
- Biological- the biodiversity of the area, types of flora and fauna, species richness, species distribution, types of ecosystems, presence or absence of endangered species and/or sensitive ecosystems etc.
- Socioeconomic- demography, social structure, economic conditions, developmental capabilities, displacement of locals, etc.

3.1.1 *Study Area:*

The study area for the mining projects is as follows:

- Mine lease area as the “core zone”
- A study area of 10 km radius from the project boundary is designated as buffer Zone and for the study of Socio-economic status, 10 km radius from the boundary limits of the mine lease area has been selected.

We have obtained Terms of Reference from SEIAA vide Letter No. SEIAA-TN/F. No.10299/SEAC/1(a) ToR-1644/2024 Dated: 09.01.2024. The baseline monitoring is carried out in

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December 2023 to February 2024 and the analysis is briefed in the EIA report. The proponent has engaged M/s. Ecotech labs Pvt. Ltd for carrying out the existing baseline study.

3.1.2 Instruments Used

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

1. Respirable Dust Sampler with attachment for gaseous Pollutants, Envirotech APM 460, APM 411.
2. Fine Particulate Matter (FPM) Sampler, APM 550
4. Sound Level Meter Model SL-4010
5. 2000 series watchdog automatic weathering monitoring station

3.1.3 Baseline Data Collection Period:

The baseline data is collected in accordance with the CPCB Guidelines. The Baseline study is carried out from December 2023 to February 2024.

3.1.4 Frequency of Monitoring

Table 3-1: Frequency of Sampling and Analysis

Attributes	Sampling	Frequency
Air environment – Meteorological (wind speed, wind direction, rainfall, humidity, temperature)	Project site	1 hourly continuous
Air environment – Pollutants PM 10 PM 2.5 SO ₂ NO _x Lead in PM	7 locations	24 hourly twice a week 4 hourly. Twice a week, One non-monsoon season 8 hourly, twice a week 24 hourly, twice a week
Noise	7 locations	24 hourly Once in 7 locations
Water (Ground water)	7 locations	Once in 7 locations

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pH, Temperature, Turbidity, Magnesium Hardness, Total Alkalinity, Chloride, Sulphate, Fluoride, Nitrate, Sodium, Potassium, Salinity, Total nitrogen, Total Coliforms, Fecal Coliforms		
Water (surface water) pH, Temperature, Turbidity, Magnesium Hardness, Total Alkalinity, Chloride, Sulphate, Fluoride, Nitrate, Sodium, Potassium, Salinity, Total nitrogen, Total Coliforms, Fecal Coliforms	Sample from nearby lakes/river.	One-time Sampling
Soil (Organic matter, Texture, pH, Electrical Conductivity, Permeability, Water holding capacity, Porosity)	7 locations	Once in 7 locations
Ecology and biodiversity Study	Study area covering 10 km radius	One-time Sampling
Socio- Economic study (Population, Literacy Level, employment, Infrastructure like school, hospitals & commercial establishments)	Villages around 10 km radius	One-time Sampling

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3.1.5 Secondary data Collection

Apart from the primary data, Secondary data is also used for the collection; collation; synthesis and interpretation.

- Flora & Faunal Study
- Land use study.
- Demography and socio-economic analysis
- Meteorological data, from Indian Meteorological Department (IMD)

3.1.6 Study area details

Table 3-2 Study area details

S. No	Description	Details	Source
1.	Project Location	S.F.No. 302/1 (1.70.50Ha.), 304/1A (0.54.00Ha.) & 304/2A (0.76.50Ha.) – 1.40.5 Ha, Anaikulam Village, Veerakeralampudur Taluk, Tenkasi District, Tamil Nadu State	Field Study
2.	Latitude & Longitude	Latitude : 09°00' 05.83" to 09°00' 16.00" N Longitude : 77°28' 32.52" to 77°28' 37.57" E	Topo Sheet
3.	Topo Sheet No.	58 G/08	Survey of India Toposheet
4.	Mine Lease Area	3.01.00 Ha	--
Demography in the study area (as per Census 2011)			
5.	Total Population	8242	Census Survey of India
6.	Total Number of Households	2272	
7.	Maximum Temperature (°C)	34	IMD
8.	Minimum Temperature (°C)	31	

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9.	Ecological Sensitive Areas - Wetlands, watercourses or other waterbodies, coastal zone, biospheres, mountains, forests	❖ Kurichanpatti Kulam – 2.30 Km - E ❖ Kattu Kulam – 2.31 Km – S ❖ Semmannu kulam – 2.94 Km – S ❖ Mariathaipuram lake – 3.48 Km – SSW ❖ Periya Devan Kulam – 4.25 Km – E ❖ Surandai Lake – 5.98 Km – SW ❖ Arunthapet Lake – 6.57 Km – SW ❖ Echantha Lake – 6.79 Km – NNE ❖ Veeranam Lake – 7.19 Km – S ❖ Pattaikulam – 8.17 Km – NW ❖ Sakkarakulam – 8.48 Km – N ❖ Sundarapandiapuram Tank – 9.16 Km - W	Google Earth/Field Study																								
10.	Densely Populated area	Anaikulam – 2.43 Km - W																									
11.	Areas occupied by sensitive man-made land uses (hospitals, schools, places of worship, community facilities)	<table> <tr> <th>S. No</th> <th>Places</th> <th>Dist. From Project Site</th> </tr> <tr> <td colspan="3">Schools & Colleges</td> </tr> <tr> <td>1</td> <td>Government Higher Secondary School, Anaikulam</td> <td>2.81 Km - W</td> </tr> <tr> <td>2</td> <td>Government Primary School, Radhamudaiyarkulam</td> <td>1.98 Km - E</td> </tr> <tr> <td>3</td> <td>Kamarajar Govt Arts & Science College, Surandai</td> <td>2.95 Km - SWW</td> </tr> <tr> <td colspan="3">Hospitals</td> </tr> <tr> <td>1</td> <td>Government Hospital, Anaikulam</td> <td>2.72 Km - W</td> </tr> <tr> <td>2</td> <td>Government Hospital, Surandai</td> <td>6.87 Km - SW</td> </tr> </table>	S. No	Places	Dist. From Project Site	Schools & Colleges			1	Government Higher Secondary School, Anaikulam	2.81 Km - W	2	Government Primary School, Radhamudaiyarkulam	1.98 Km - E	3	Kamarajar Govt Arts & Science College, Surandai	2.95 Km - SWW	Hospitals			1	Government Hospital, Anaikulam	2.72 Km - W	2	Government Hospital, Surandai	6.87 Km - SW	Google Earth/Field Study
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Hospitals																											
1	Government Hospital, Anaikulam	2.72 Km - W																									
2	Government Hospital, Surandai	6.87 Km - SW																									

3.1.7 Site Connectivity:

The site is connected to the roadways as follows. Village Road – Mariyathaipuram Village Road.

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Figure 3.1: Site Connectivity

3.2 LAND USE ANALYSIS

3.2.1 Land Use Classification

Land Use / Land Cover - Land Use refers to man's activity and the various uses, which are carried on land. Land Cover refers to natural vegetation, water bodies, rock/soil, artificial cover and others, resulting due to land transformation. The present Land Use/Land Classification map is developed with following objectives. The main objective of the study is to classify the different land use within 10 km from the project boundary.

3.2.2 Methodology

Information of land use and land cover is important for many planning and management activities concerning the surface of the earth (Agarwal and Garg, 2000). Land use refers to man's activities on land, which are directly related to land (Anderson et al., 1976). The land use and the land cover

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determine the infiltration capacity. Barren surfaces are poor retainers of water as compared to grasslands and forests, which not only hold water for longer periods on the surface, but at the same time allow it to percolate down.

The terms 'land use' and 'land cover' (LULC) are often used to describe maps that provide information about the types of features found on the earth's surface (land cover) and the human activity that is associated with them (land use). Satellite remote sensing is being used for determining different types of land use classes as it provides a means of assessing a large area with limited time and resources. However, satellite images do not record land cover details directly and they are measured based on the solar energy reflected from each area on the land. The amount of multi spectral energy in multi wavelengths depends on the type of material at the earth's surface and the objective is to associate particular land cover with each of these reflected energies, which is achieved using either visual or digital interpretation. In the present study the task is to study in detail the land use and land cover in and around the project site. The study envisages different LULC around the proposed project area and the procedure adopted is as below.

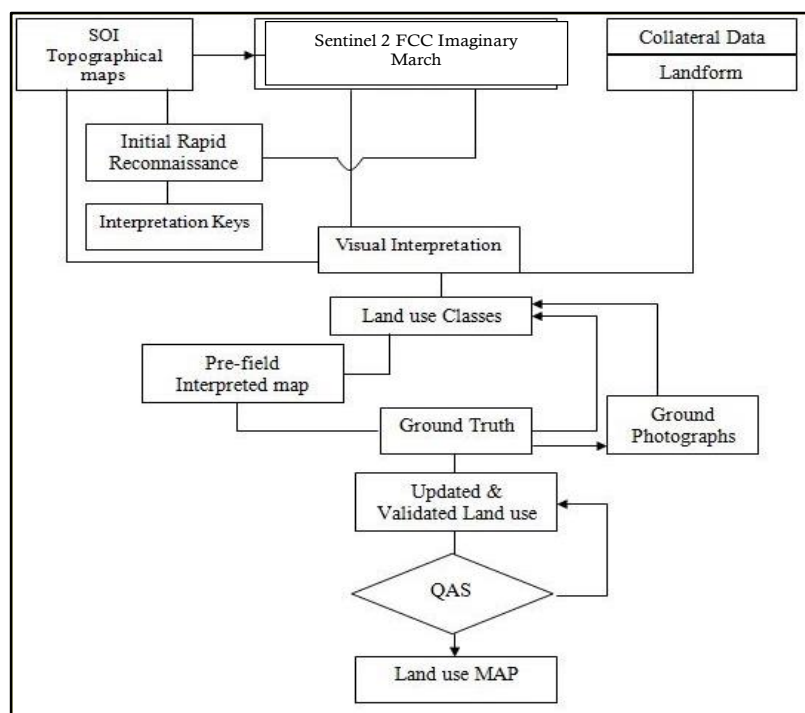


Figure 3.2 Flow Chart showing Methodology of Land use mapping.

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3.2.3 *Satellite Data*

Sentinal 2 multispectral satellite data of 2020 was utilized for the present study. Details of satellite data is given below. The rectification of imagery was carried out on to bring the digital data on the earth coordinate system by means of ground control point (GCP) assignments/SOI topo sheets.

3.2.4 *Scale of mapping*

Considering the user defined scale of mapping, 1:50000 Sentinal 2 data was used for Land use / Land cover mapping of 10 km radius for proposed site. The description of the land use categories for 10 km radius and the statistics are given for 10 km radius.

3.2.5 *Interpretation Technique*

Standard on screen visual interpretation procedure was followed. The various Land use / Land cover classes interpreted along with the SOI topographical maps during the initial rapid reconnaissance of the study area. The physiognomic expressions conceived by image elements of color, tone, texture, size, shape, pattern, shadow, location and associated features are used to interpret the FCC imagery. Image interpretation keys were developed for each of the LU/LC classes in terms of image elements.

June 2016 FCC imagery (Digital data) of the study area was interpreted for the relevant land use classes. On screen visual interpretation coupled with supervised image classification techniques are used to prepare the land use classification.

1. Digitization of the study area (10 km radius from the proposed site) from the topo maps
2. In the present study the sentinal satellite image and SOI topo sheets of 58J/10, 58J/11, 58J/14, 58J/15 have been procured and interpreted using the ERDAS imaging and ARC-GIS software adopting the necessary interpretation techniques.
3. Satellite data interpretation and vectorization of the resulting units
4. Adopting the available guidelines from manual of LULC mapping using Satellite imagery (NRSA, 1989)
5. Field checking and ground truth validation
6. Composition of final LULC map

The LULC Classification has been done at three levels where level -I being the broad classification about the land covers that is Built-up land, agriculture land, waste land, wet lands, and water bodies. These are followed by level –II where built-up land is divided into towns/cities as well villages. The

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agriculture land is divided into different classes such as cropland, Fallow, Plantation, while wastelands are broadly divided into, Land with scrub and without Scrub and Mining and Industrial wasteland. The wetlands are classified into inland wetlands, coastal wetlands and islands. The water bodies are classified further into River/stream, Canal, Tanks and bay. In the present study level II classification has been undertaken. The SOI Topo map is presented in Annexure and Satellite imagery of 10 km radius from the project site is presented Annexure.

3.2.6 Field Verification

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

3.2.7 Description of the Land Use / land cover classes

3.2.7.1 Water

Areas where water was predominantly present throughout the year; may not cover areas with sporadic or ephemeral water; contains little to no sparse vegetation, no rock outcrop nor built up features like docks; examples: rivers, ponds, lakes, oceans, flooded salt plains.

3.2.7.2 Trees

Any significant clustering of tall (~15m/higher) dense vegetation, typically with a closed/dense canopy; examples: wooded vegetation, clusters of dense tall vegetation within savannas, plantations, swamp/mangroves (dense/tall vegetation with ephemeral water/canopy too thick to detect water underneath).

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3.2.7.3 Grass

Open areas covered in homogenous grasses with little to no taller vegetation; wild cereals and grasses with no obvious human plotting (i.e., not a plotted field); examples: natural meadows and fields with sparse to no tree cover, open savanna with few to no trees, parks/golf courses/lawns, pastures.

3.2.7.4 Flooded vegetation

Mix of small clusters of plants or single plants dispersed on a landscape that shows exposed soil or rock; scrub-filled clearings within dense forests that are clearly not taller than trees; examples: moderate to sparse cover of bushes, shrubs and tufts of grass, savannas with very sparse grasses, trees or other plants.

3.2.7.5 Crops

Human planted/plotted cereals, grasses, and crops not at tree height; examples: corn, wheat, soy, fallow plots of structured land.

3.2.7.6 Scrub/Shrub

Mix of small clusters of plants or single plants dispersed on a landscape that shows exposed soil or rock; scrub-filled clearings within dense forests that are clearly not taller than trees; examples: moderate to sparse cover of bushes, shrubs and tufts of grass, savannas with very sparse grasses, trees or other plants

3.2.7.7 Built Area

Human made structures; major road and rail networks; large homogenous impervious surfaces including parking structures, office buildings and residential housing; examples: houses, dense villages / towns / cities, paved roads, asphalt.

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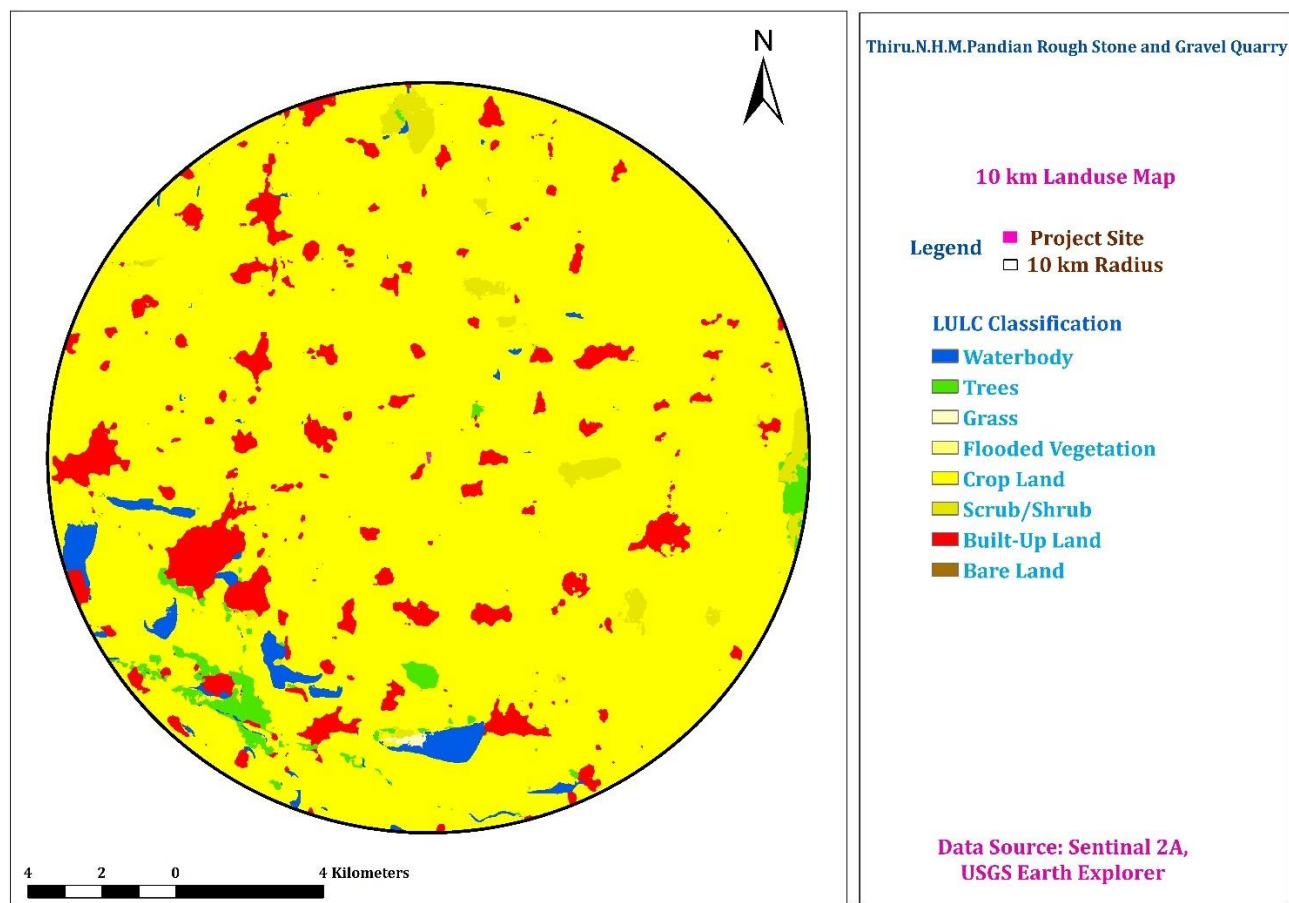


Figure 3.3 Land use classes around 10 km radius from the project site

3.2.7.8 Different Land use classes around 10 km radius from the project site

Table 3-3 Land use pattern

Sl.No	Categories	Area in Sq.m
1	Water Body	5.75
2	Trees	4.7
3	Grass	0.24
4	Flooded vegetation	0.01
5	Crops	276.82
6	Scrub/Shrub	5.14
7	Built-up Area	23.15
8	Barren Land	0.003
Total		315.813

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3.3 WATER ENVIRONMENT

3.3.1 *Contour & Drainage*

The project site is 194.0 m MSL.

3.3.2 *Geomorphology*

Tenkasi district is bordered by Western Ghats (Ridge and valley complex) in the West. A major part of the district constitutes a plain terrain with a gentle slope toward East and Southeast, except for the hilly terrain in the west. The general elevation of the area varies from less than 10 to 1408 m amsl (Tulukkaparai hill range). The prominent geomorphic units identified in the district through interpretation of Satellite imagery are Structural Hill, Bazada Zone, Valley Fill, Flood Plain, Pediment, Shallow buried pediment, Deep buried pediment and Coastal Plain.

Soils

Soils in the area have been classified into i) Deep Red soil ii). Red Sandy Soil. iii) Block Cotton Soil. iv) Saline Coastal Alluvium, and v) River Alluvium. Major parts of the area are covered by Deep Red soil and are found in Sivakasi, Tenkasi, Senkottai and Sankarankoil blocks and it is suitable for cultivating coconut and palmyrah trees. Red sandy soil also in reddish yellow in colour and are found in Nanguneri, Ambasamudram, and Radhapuram blocks and it is suitable for cultivating groundnut, millets and pulses etc., The Block Cotton Soil is found in Tirunelveli, Palayankottai and Sankarankoil blocks, and it is suitable for cultivating Paddy, Ragi, and Cholan etc., The Saline Coastal Alluvium are dark grey to deep brown in colour and spread over the Nanguneri and Radhapuram blocks. The River alluvial soils occur along the river courses of Tamrabarani and Chittar river covering in the blocks Tirunelveli and Palayankottai and it is suitable for cultivating Groundnut, Chillies and Cumbu.

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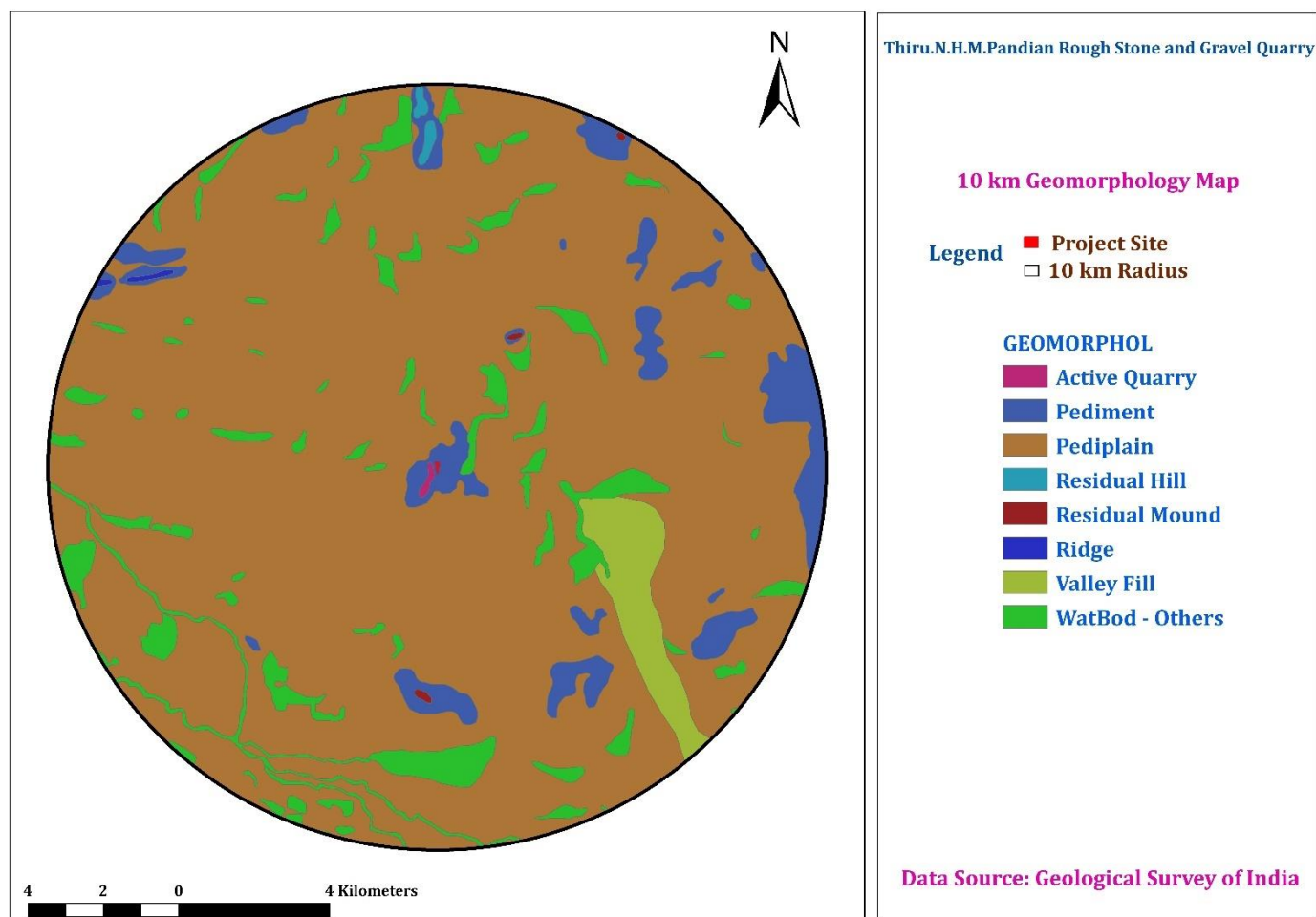


Figure 3.4 Geomorphology within 10km from the project site

3.3.3 Geology:

Southern Granulite Terrain (SGT) of Tamil Nadu lying south of Palaghat-Cauvery shear zone has been divided into two major tectonic blocks by the Madurai block and Nagercoil-Trivandrum Block in the south. It is separated by WNW-ESE trending Achankovil-Tambaraparani Lineament. Tirunelveli and Thothukudi are significantly the only districts in the state to witness the geology and structure of both the blocks. Tirunelveli district represents a well-developed lithopackage of meta-sedimentary sequence inter banded with charnockite Group of rocks. The rock types exposed are of quartzite, calc-granulite, garnet-biotite-sillimanite gneiss, garnet quartzo-feldspathic gneiss and garnetbiotite-cordierite gneiss

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belonging to Khondalite Group of rock. Charnockite and pyroxene granulite are the Charnockite Group. Hornblende-biotite gneiss belongs to Migmatitic Complex. Besides, basic intrusive (pyroxenite) and acid intrusive (granite) are noticed. The younger intrusive are represented by pegmatite and quartz veins. Evidence of development of incipient / patchy charnockite along the shear plane is noticed in the district along the Western Ghat high hills.

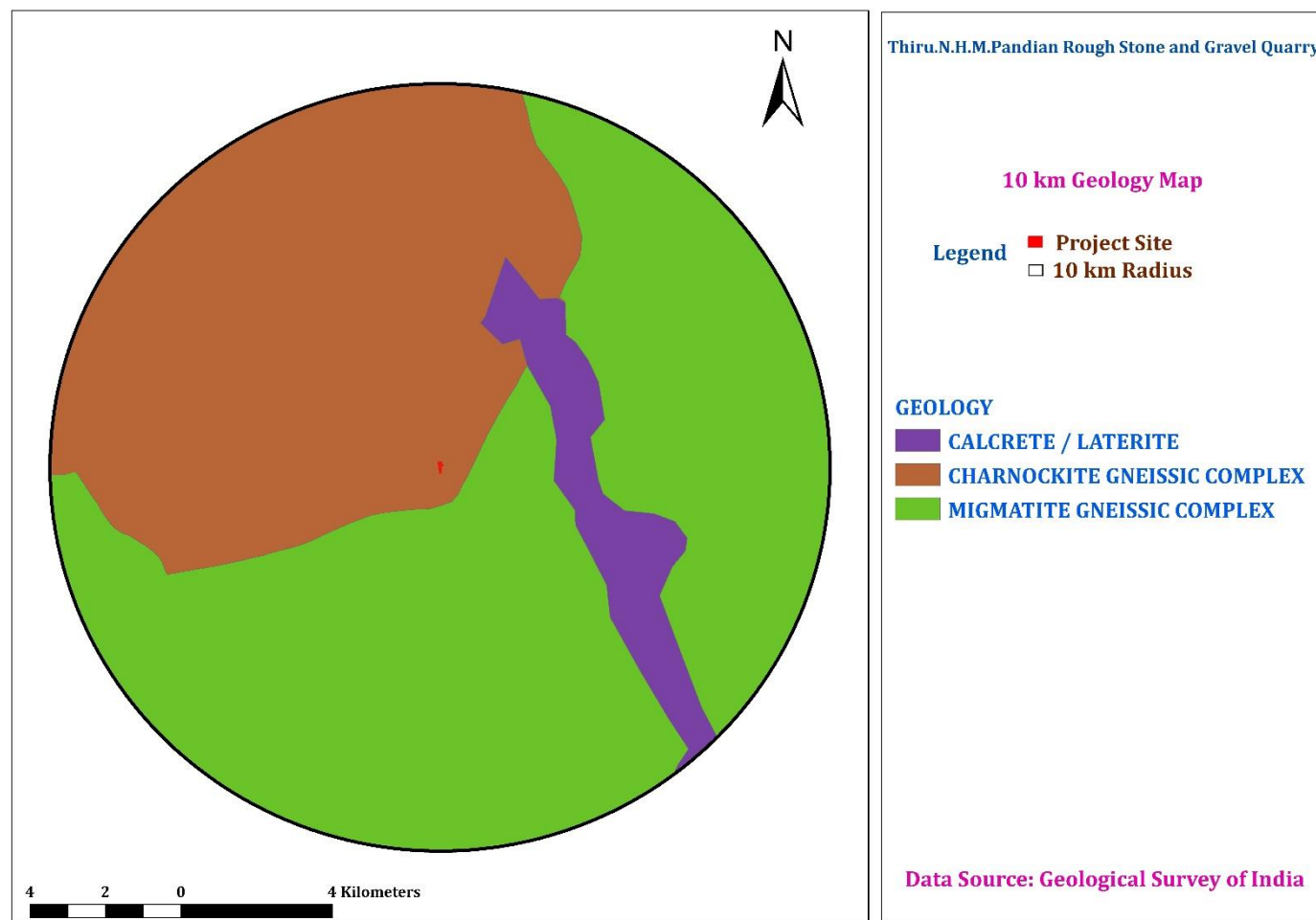


Figure 3.5 Geology within 10km from the project site

3.3.4 Hydrogeology

The district is underlain by both porous and fissured formations. The important aquifer systems in the district are constituted by i) Weathered and fractured hard rock formations of Archaean age. ii) Porous sedimentary formations ranging in age from Tertiary and Recent. The porous formations are found as

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small patch in the southeastern part of the district and include sandstones, Limestones, Laterite and Clays from Tertiary to Quaternary. The isolated occurrence of calcareous sandstone and fossiliferous limestone are seen in coastal area on the southeastern side. The fossiliferous limestone is found south west of Kudankulam covering an area of 3 sq.km. Laterites are exposed as patches along Radhapuram-Edakkadu, Vijayanarayanam-Kumarapuram, Ittamoli, Nanguneri and Uramozi area. Beach sand occurs as a patch along the coast with a width varying from 50-250m in Idindakarai-Ovari Belt. The river alluvium is found along the river courses and the thickness of alluvium is restricted to 5-6m. The exploration in sedimentary tract has revealed that the depth to basement occurs at a depth of 120m bgl and granular zones are encountered between the depths of 20 to 92 m bgl. The yield of bore wells varies from 1-4.5 lps. The aquifer at the shallow depth is under unconfined condition and aquifer at depth is under semi-confined to confined condition. The shallow aquifer is developed through dug wells and deeper aquifer through tube wells. The dug well can sustain a pumping of 4 to 6 hours while the tube wells can sustain a pumping of 6-8 hours. The water-bearing properties of crystalline formations, which lack primary porosity, depend on the extent of development of secondary intergranular porosity. These aquifers are highly heterogeneous in nature due to variation in lithology, texture and structural features even within short distances. Ground water generally occurs under phreatic conditions in the weathered mantle and under semi-confined conditions in the fissured and fractured zones at deeper levels. The thickness of weathered zone in the district is in the ranges up to 30m bgl.

The yield of large diameter wells in the district, tapping the weathered mantle of crystalline rocks ranges from 50 to 250 lpm and are able to sustain pumping for 3 to 5 hours per day. The Specific capacity of large diameter wells tested in crystalline rocks ranges from 25 to 300 lpm / m. of drawdown. The yield characteristics of wells vary considerably depending on the topographic set-up, lithology and nature of weathering. The groundwater exploration in the district down to a depth of 200m bgl has revealed that in the western part of the district potential fractures are encountered beyond 100m bgl while in the rest of the area, potential fractures are restricted to 100m bgl. The yield of the wells varies from 1 to 3.6 lps. In general, the wells drilled by various State agencies mainly for domestic purposes have yield in the range of 63 to 270 lpm. The depth to water level in the district varied between 1.19 to 13.35 m bgl during premonsoon depth to water level (May 2006) and varied between 0.18 to 7.97 m bgl during post monsoon depth to water level (Jan 2007). The seasonal fluctuation shows a fall in water level, which ranges from -0.12 to -2.14 m bgl, and rise in water level, which ranges from 0.33 to 11.24 m bgl. The

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piezometric head varied between 1.72 to 13.65 m bgl (May 2006) during pre-monsoon and 0.47 to 13.25 m bgl during post monsoon.

Aquifer Parameters:

Formation	Yield of wells (lps)	Transmissivity (m ² /day)	Hydraulic Conductivity (m/day)	Specific Yield (%)	Storativity
Porous Formation	1.0-4.5	50-250	20-65	3-6	1.98X10 ⁻⁴
Weathered Rock	<1-4.0	25-150	<1-15	1.5	-
Fractured Rock	1.0-3.6	25-250	<1-25	-	1.87X10 ⁻⁵ to 4.8X10 ⁻³

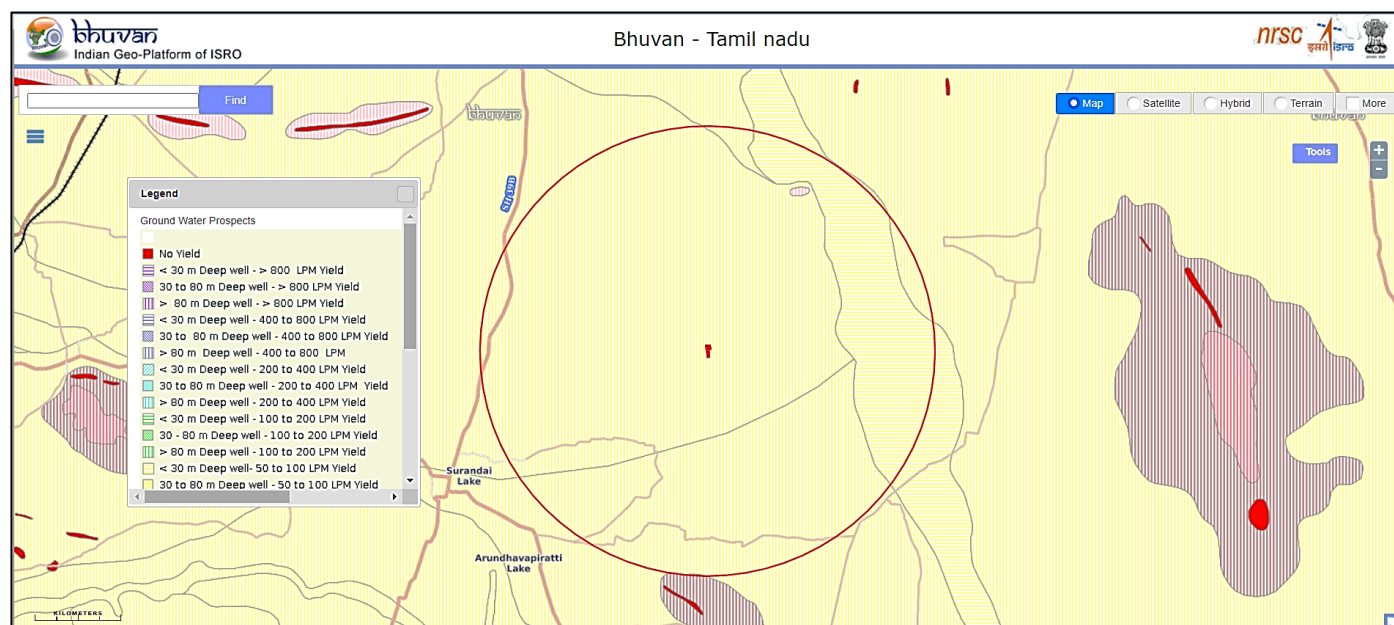


Figure 3.6 Ground water prospects within 5 km radius of the project site

3.3.5 Ground water quality monitoring

Ground water quality monitoring is done in the following locations and analysis will be done for physical, chemical & Biological parameters.

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Table 3-4 Ground water Quality Analysis

Environmental Parameters: Ground water Quality Analysis	
Monitoring Period	December 2023 to February 2024
Design Criteria	Based on the Environmental settings in the study area
Monitoring Locations	Project site - GW 1 Sri Pillaiyar Kovil, Melakaangal – GW 2 KS Bricks Factory, E.Meenachipuram, Surandai – GW 3 P.J.Sweet, Kadayanallur Road, Sendamaram – GW 4 Milagudaiyar Sastha Kovil, Uthumalai – GW 5 Karuppasamy.pechi amman kovil, Sendamaram- GW 6 Trumalaiandi garden LPM, Vadiyur – GW 7
Methodology	Water Samples were collected in 5 Litre fresh cans as per IS 3025 Part I and transported to the laboratory in Iceboxes
Frequency of Monitoring	Once in a season

3.3.5.1 Sampling Procedure

Quality of ground water was compared with IS: 10500: 1991 (Reaffirmed 1993 With Amendment NO -3 July 2010) for drinking purposes. Water samples were collected as Grab sample from five sampling locations in a 5-liter plastic jerry can and 250 ml sterilized clean glass/pet bottle for complete physico-chemical and bacteriological tests respectively. The samples were analyzed as per standard procedure / method given in IS: 3025 (Revised Part) and standard method for examination of water and wastewater Ed. 21st, published jointly by APHA.

Table 3-5: Standard Procedure

S. No	Parameters	Test Method
1	pH (at 25°C)	IS:3025(P -11)1983 RA: 2012
2	Electrical Conductivity	IS:3025(P -14) 2013
3	Colour	IS:3025 (P -4)1983 RA: 2012
4	Turbidity	IS:3025(P -10)1984 RA: 2012
5	Total Dissolved Solids	APHA 22 nd Edn.2012-2540-C
6	Total Suspended Solids	IS:3025(P-17)-1984 RA:2012

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7	Total Hardness as CaCO ₃	APHA 22 nd Edn.2012-2340-C
8	Calcium as Ca	APHA 22 nd Edn.2012.3500 Ca-B
9	Magnesium as Mg	APHA 22 nd Edn.2012-3500 Mg-B
10	Chloride as Cl	IS:3025(P -32)-1988 RA: 2014
11	Sulphate as SO ₄	APHA 22 nd Edn.2012-4500 SO ₄ -E
12	Total Alkalinity as CaCO ₃	APHA 22 nd Edn.2012-2320-B
13	Iron as Fe	IS:3025(P -53):2003 RA: 2014
14	Silica as SiO ₂	IS:3025(P -35)1988 RA: 2014
15	Fluoride as F	APHA 22 nd Edn.2012-4500-F-D
16	Nitrate as NO ₃	IS:3025(P -34):1988 RA: 2014
17	Sodium as Na	IS:3025(P -45):1993 RA: 2014
18	Potassium as K	IS:3025(P -45):1993 RA: 2014
19	Coliform	IS:1622:1981:RA:2014
20	E. coli	IS:1622:1981:RA:2014

Table 3-6 Ground water sampling results

S. No	Parameters	Units	GW 1	GW 2	GW 3	GW 4	GW 5	GW 6	GW 7
1z	pH (at 25°C)	-	7.47	7.06	7.14	8.24	7.6	7.97	7.1
2	Electrical Conductivity	µS/cm	610	950	2860	480	1300	1850	1310
3	Colour	Hazen Unit	4	2	3	3	5	4	5
4	Turbidity	NTU	BQL (LOQ:1)	BQL (LOQ:1)	BQL (LOQ:1)	BQL (LOQ:1)	BQL (LOQ:1)	BQL (LOQ:1)	BQL (LOQ:1)
5	Total Dissolved Solids	mg/L	350	522	1673	274	755	1050	720
6	Total Suspended Solids	mg/L	BQL (LOQ:2)	BQL (LOQ:2)	BQL (LOQ:2)	BQL (LOQ:2)	BQL (LOQ:2)	BQL (LOQ:2)	BQL (LOQ:2)
7	Total Hardness as CaCO ₃	mg/L	201	277	426	87.4	327	699	319
8	Calcium Hardness as CaCO ₃	mg/L	110	163	95	39.9	167	304	156

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9	Magnesium Hardness as MgCO ₃	mg/L	91	114	331	47.5	160	395	163
10	Calcium as Ca	mg/L	44.2	65.5	38.1	15.9	67	121	62.4
11	Magnesium as Mg	mg/L	22.2	27.7	80.4	11.6	38.8	96.4	39.7
12	Chloride as Cl	mg/L	33.5	110	495	63.5	177	201	185
13	Sulphate as SO ₄	mg/L	72.5	55.6	334	17.7	68.1	165	103
14	Total Alkalinity as CaCO ₃	mg/L	179	164	431	136	281	307	145
15	Iron as Fe	mg/L	BQL(LO Q:0.1)	BQL(LO Q:0.1)	BQL(LO Q:0.1)	BQL(LO Q:0.1)	BQL(LO Q:0.1)	BQL(LO Q:0.1)	BQL(LO Q:0.1)
16	Silica as SiO ₂	mg/L	20.7	20.7	48.3	15.7	20.9	35.6	27.2
17	Fluoride as F	mg/L	0.74	1	2.09	0.17	0.38	1.13	0.39
18	Nitrate as NO ₃	mg/L	18.8	32.8	42.1	6.68	50.1	50.1	45
19	Potassium as K	mg/L	9.3	5.3	53.3	1.6	10.7	11.5	11.3
20	Sodium as Na	mg/L	22.4	104.8	329	59.4	158	186.4	154

3.3.6 Interpretation of results:

3.3.6.1 Physical parameters of water:

The basic physical parameters of water include

Colour:

Value observed in Project Site (True/Apparent Color): 4 Hazen unit.

Acceptable and permissible limits: 5 Hazen units and 15 Hazen units respectively. The value in the project site is as same as the acceptable limits prescribed by IS 10500: 2012 (referred as “Standards” from herein).

pH:

Value observed in the Project Site: 7.47

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Project Proponent	<i>Thiru.N.H.M.Pandian</i>	
Project Location	<i>Anaikulam Village, Veerakeralampudur Taluk, Tenkasi District</i>	

Acceptable and permissible limits: 6.5-8.5. The pH value is the measure of acid – base equilibrium. The value of pH in the project site clearly indicates that water is slightly neutral in nature.

Turbidity:

Value observed in the Project Site: BQL(LOQ:1)

Acceptable and permissible limits: 1 NTU & 5 NTU respectively. The value of turbidity generally indicates the presence of phytoplanktons and other sediments. The value in the project site indicates the water is slightly turbid.

Total Dissolved Solids:

Value observed in the Project Site: 350 mg/L.

Acceptable and permissible limits: 500 mg/L and 2000 mg/L respectively.

The TDS is the presence of the inorganic salts and small amounts of organic matter present in the water. This is mainly due to the result of surface runoff as the cations and anions in the topsoil is carried away by the water. The value in the project site indicates the water is less turbid.

3.3.6.2 Chemical parameters of water:

The chemical parameters of the drinking water include,

Calcium:

Value observed in the Project Site: 44.2 mg/L.

Acceptable and permissible limits: 75mg/L and 200 mg/L respectively.

Calcium is the essential macronutrient. The value of the calcium is within the prescribed permissible standards. The higher level of calcium may cause hardening in domestic equipment and will also reduce the detergent efficiency. Higher levels of calcium will lead to constipation, gas, and bloating. Apart from that, extra calcium may also increase the risk of kidney stones. If the calcium deposit in blood is high, it may lead to hypercalcemia.

Magnesium:

Value observed in the Project Site: 22.2 mg/L.

Acceptable and permissible limits: 30 mg/L and 100 mg/L respectively.

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Project Proponent	<i>Thiru.N.H.M.Pandian</i>	
Project Location	<i>Anaikulam Village, Veerakeralampudur Taluk, Tenkasi District</i>	

The value of Magnesium in the project site is higher than acceptable limit and less than the permissible limit. The increase in the level of magnesium will cause diarrhea and vomiting in children.

Chloride

Value observed in the project site: 33.5 mg/L.

Acceptable and permissible limits: 250 mg/L and 1000 mg/L respectively.

The chloride level in the project site is within the acceptable and permissible limit. If the level of chloride is more, it may cause galvanic and pitting corrosion, increases level of metals. It imparts bitter taste to the water.

Total Alkalinity as CaCO₃:

Value observed in the project site: 179 mg/L.

Acceptable and permissible limits: 200 mg/L and 600 mg/L respectively.

Total Alkalinity is the measure of the concentration of all alkaline substances dissolved in the water which includes carbonates, bicarbonates and hydroxides. The value of the total alkalinity is slightly greater in the project site, which will impart soda taste to the water.

Hardness:

Value observed in the Project Site: 201 mg/L.

Acceptable and permissible limits: 200 mg/L and 600 mg/L respectively.

The value of Hardness in the project site is higher than acceptable limit but within the permissible limit. The increase in the level of hardness may cause corrosion and scaling problems, increased soap consumption and it also contributes to the salty taste of water.

3.3.7 Surface Water Analysis

Surface water samples were taken from **Kurichanpatti Kulam and Sundarapandiapuram Tank.**

The results are summarized below.

Project	Rough stone and Gravel Quarry - 3.01.00 Ha	Draft EIA Report
Project Proponent	Thiru.N.H.M.Pandian	
Project Location	Anaikulam Village, Veerakeralampudur Taluk, Tenkasi District	

Table 3-7 Surface Water Sample Results

S. No	Parameters	Units	Kurichanpatti Kulam	Sundarapandiapuram Tank
1	pH (at 25°C)	-	7.23	7.93
2	Electrical Conductivity	µS/cm	290	490
3	Colour	Hazen Unit	4	4
4	Turbidity	NTU	BQL(LOQ:1)	BQL(LOQ:1)
5	Total Dissolved Solids	mg/L	160	270
6	Total Suspended Solids	mg/L	BQL(LOQ:2)	BQL(LOQ:2)
7	Total Hardness as CaCO ₃	mg/L	106	163
8	Calcium Hardness as CaCO ₃	mg/L	60.6	91.2
9	Magnesium Hardness as CaCO ₃	mg/L	45.5	72.2
10	Calcium as Ca	mg/L	24.3	36.5
11	Magnesium as Mg	mg/L	10.9	17.5
12	Chloride as Cl	mg/L	25.6	45.3
13	Sulphate as SO ₄	mg/L	8.96	22.8
14	Total Alkalinity as CaCO ₃	mg/L	70.7	137
15	Iron as Fe	mg/L	BQL(LOQ:0.1)	BQL(LOQ:0.1)
16	Silica as SiO ₂	mg/L	7.05	10.5
17	Fluoride as F	mg/L	1.02	0.79
18	Nitrate as NO ₃	mg/L	6.58	10.8
19	Potassium as K	mg/L	1.5	2.7
20	Sodium as Na	mg/L	22.2	39.6

Inference: The surface water quality is compared with the CPCB Water Quality Criteria against A, B, C, D & E class of water. From the test result, it is found that both the water does not fit Class A (Drinking Water Source without conventional treatment but after disinfection). But they can be used for outdoor bathing as it meets the requirements shown for class B water.

Project	Rough stone and Gravel Quarry - 3.01.00 Ha	Draft EIA Report
Project Proponent	Thiru.N.H.M.Pandian	
Project Location	Anaikulam Village, Veerakeralampudur Taluk, Tenkasi District	

3.3.7.1 Climatology & Meteorology:

Climate and meteorology of a place can play an important role in the implementation of any developmental project. Meteorology is also the key to understand local air quality as there is an essential relationship between meteorology and atmospheric dispersion involving wind in the broadest sense of the term.

The year may broadly be divided into four seasons:

Winter season	:	December to February
Pre-monsoon season	:	March to May
Monsoon season	:	June to September
Post-monsoon season	:	October to November

i) Climate

Eastern part of the district experiences hot climate and Western part has a contrasting pleasant cold climate. The district is hot and dry in summer i.e., from March to June. From July to November is rainy season and between December to February winter prevails with very cold and misty.

ii) Temperature

The maximum temperature is around 34°C and minimum temperature is 31°C.

iii) Rainfall

Tirunelveli receives rainfall from both the northeast and the southwest monsoons. The monsoon season is from the months of July to November. During this time, the temperature is mild and pleasant. Heavy rainfall is expected in short intervals during this period. December to February are winter months.

This district gets maximum rainfall in November (274.7mm).

TIRUNELVELI DISTRICT -NORMAL AND ACTUAL RAINFALL

Unit in mm.

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
	R/F	R/F	R/F	R/F	R/F	R/F	R/F	R/F	R/F	R/F	R/F	R/F
2016	3	0.0	1.7	3.1	77.6	6.9	60.0	24.0	25.7	72.5	42.9	57.9
2017	23.2	6.2	38.1	14.2	92.4	10.0	24.1	122.5	137.0	125.7	67.6	139.0

Project	<i>Rough stone and Gravel Quarry - 3.01.00 Ha</i>	<i>Draft EIA Report</i>
Project Proponent	<i>Thiru.N.H.M.Pandian</i>	
Project Location	<i>Anaikulam Village, Veerakeralampudur Taluk, Tenkasi District</i>	

2018	0.1	28.4	26.3	62.7	149.0	8.0	52.5	58.5	108.4	182.7	75.2	7.5
2019	8.1	3.5	6.8	0.5	6.0	29.3	12.8	89.7	178.7	203.5	111.9	62.8
2020	7.7	0.0	0.0	32.6	80.4	24.0	78.8	47.9	79.4	127.6	284.0	97.9

Source: District survey report

Meteorological Data

The meteorological data – Temperature, rainfall, Wind Speed, Wind direction are recorded through AWS by setting it up in the site.

vi) Wind Rose Diagram

The wind rose denotes a class of diagrams designed to display the distribution of wind direction at a given location over a period of time. Wind roses are also useful as they project a large quantity of data in a simple graphical plot.

The wind speed & wind direction data are taken, and wind rose is plotted for December 2023 to February 2024.

Project	Rough stone and Gravel Quarry - 3.01.00 Ha	Draft EIA Report
Project Proponent	Thiru.N.H.M.Pandian	
Project Location	Anaikulam Village, Veerakeralampudur Taluk, Tenkasi District	

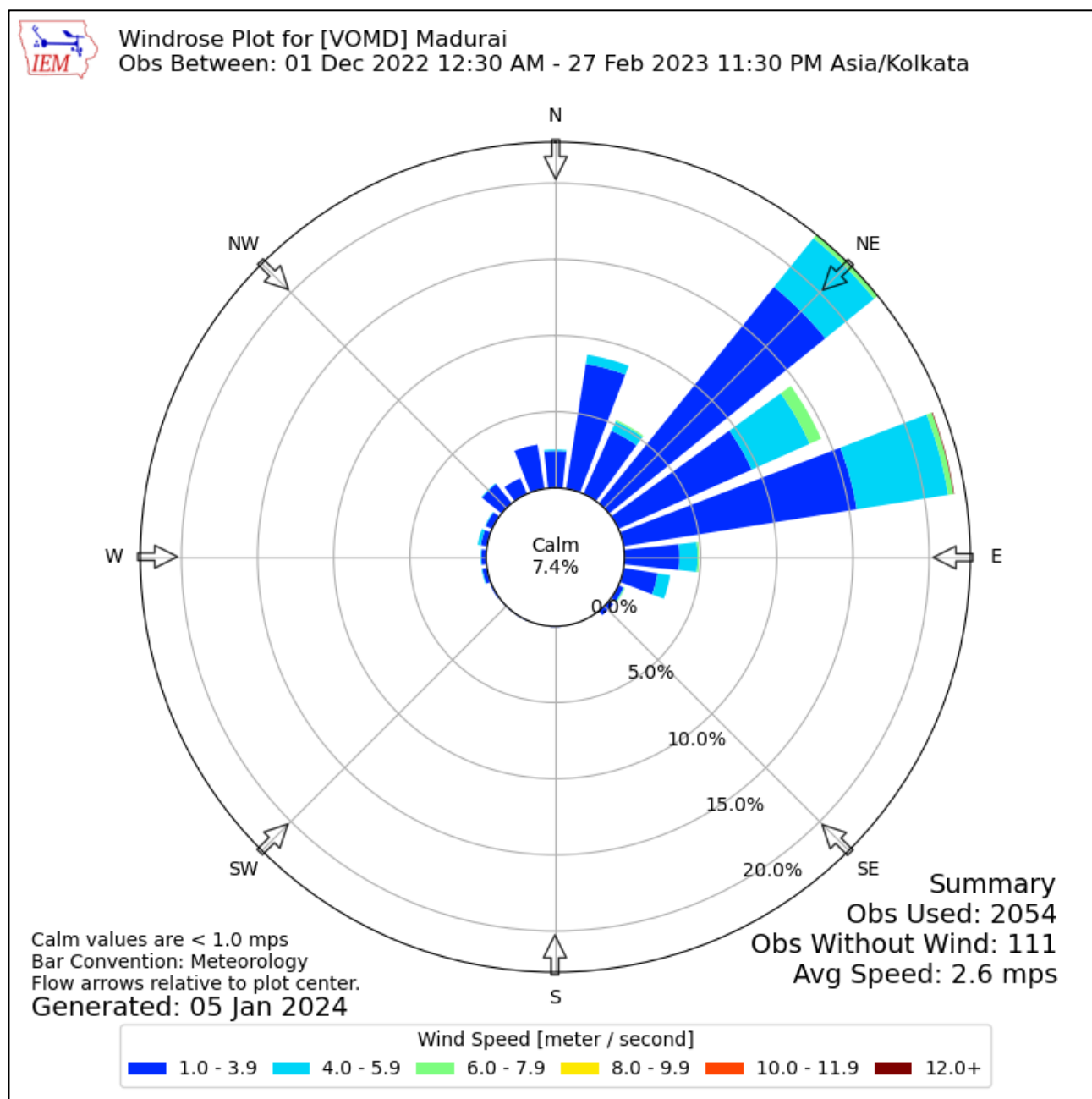


Figure 3.7 Wind rose.

3.3.8 Selection of Sampling Locations:

Four Monitoring locations along with the project site is selected based on Wind Direction & Wind Speed. All the monitoring locations are chosen in the downwind direction.

<i>Project</i>	<i>Rough stone and Gravel Quarry - 3.01.00 Ha</i>	<i>Draft EIA Report</i>
<i>Project Proponent</i>	<i>Thiru.N.H.M.Pandian</i>	
<i>Project Location</i>	<i>Anaikulam Village, Veerakeralampudur Taluk, Tenkasi District</i>	

3.4 AMBIENT AIR QUALITY

Table 3-8: Selection of Sampling Location

Environmental Parameters: <i>Ambient Air</i>	
Monitoring Period	December 2023 to February 2024
Design Criteria	The monitoring stations are selected based on factors like topography/terrain, prevailing meteorological conditions like predominant wind direction (December 2023 to February 2024), etc, play a vital role in the selection of air sampling stations. Based on these criteria, 7 air sampling station were selected in the area as shown below.
Monitoring Locations	1.Project site - AAQ 1 2.Sri Pillaiyar Kovil, Melakaangal - 3.89 km - AAQ 2 3.KS Bricks Factory, E.Meenachipuram, Surandai - 8.44 km - AAQ 3 4.P.J. Sweet, Kadayanallur Road, Sendamaram - 6.03 km - AAQ 4 5.Milagudaiyar Sastha Kovil, Uthumalai 8.81 km - AAQ 5 6.Karuppasamy.pechi amman kovil, Sendamaram - 6.69 km - AAQ 6 7.Trumalaiandi garden LPM, Vadiyur - 2.35 km - AAQ 7
Methodology	Respirable Particulate Matter (PM10) - Gravimetric (IS 5182: Part 23:2006) Particulate Matter PM2.5 - Gravimetric (Fine particulate matter) Sulphur Dioxide - Calorimetric (West & Gaeke Method) (IS 5182: Part 02: 2001) Nitrogen Dioxide - Calorimetric (Modified Jacob & Hocheiser Method) (IS 5182: Part 06:2006)
Frequency of Monitoring	2 days in a week, 4 weeks in a month for 3 months in a season.

3.4.1 *Ambient Air Quality: Results & Discussion*

The test results of the ambient air quality monitored in project site and other four locations is summarized below.

Project	Rough stone and Gravel Quarry- 3.01.00 Ha	Draft EIA Report
Project Proponent	Thiru.N.H.M.Pandian	
Project Location	Anaikulam Village, Veerakeralampudur Taluk, Tenkasi District	

Table 3-9 Ambient Air Quality

Code	Location	PM 10 (µg/m³)				PM 2.5 (µg/m³)				SO2 (µg/m³)				NOx (µg/m³)			
		Min	Max	Avg	98 percentiles	Min	Max	Avg	98 percentiles	Min	Max	Avg	98 percentiles	Min	Max	Avg	98 percentiles
AAQ 1	Project Site	31	45	37.9	44.12	12	19.0	15.7	19.04	5	7	6.1	7	8	15	11.9	14.8
AAQ 2	Sri Pillaiyar Kovil, Melakaangal	44	52.7	48.5	52.10	17	26	20.4	25.08	7	17.5	10.8	17.04	16	28.3	17.7	27.31
AAQ 3	KS Bricks Factory, Surandai	38	50.6	44.3	49.94	20	25.8	22.7	25.60	9	16.6	14.1	16.6	17	29.2	23.3	28.53
AAQ 4	P.J.Sweet, Kadayanallur Road, Sendamaram	41.8	49	45.1	48.54	21	29	23.7	28.08	13	19	16.4	18.7	19	31.3	24.6	30.7
AAQ 5	Milagudaiyar Sastha Kovil, Uthumalai	49	57	52.8	56.85	16	23	20.0	22.54	8.6	14	10.9	13.54	13	26	19.8	25.08
AAQ 6	Pechi amman kovil, Sendamaram	36	45	41.1	45	15	20.6	18.2	20.59	6	12	7.7	10.9	10	22.8	14.7	21.5
AAQ 7	Tirumalaiandi garden LPM, Vadiyur	46	54.3	50.7	54.25	19	27.6	23.2	27.11	11	17.1	13.2	17.12	18	29	22.1	28.8
NAAQ Standards - Residential Area		100 (µg/m³)				60(µg/m³)				80 (µg/m³)				80 (µg/m³)			

Project	Rough stone and Gravel Quarry - 3.01.00 Ha	Draft EIA Report
Project Proponent	Thiru.N.H.M.Pandian	
Project Location	Anaikulam Village, Veerakeralampudur Taluk, Tenkasi District	

3.4.2 Interpretation of ambient air quality:

To assess the impact, AAQ were monitored in project site and four locations.

Observation:

The Maximum value of PM₁₀ (57 (µg/m³), PM_{2.5} (29 (µg/m³), SO_x (19 (µg/m³), NO_x (31 (µg/m³) is observed in different places.

Inference:

The monitoring results for PM₁₀, PM_{2.5}, SO_x, NO_x was found to be high in Sri Santhana Mariyamman Kovil, Achampatti which is due to the movement of vehicles .

The observed values are all well within the Standards prescribed by NAAQ.

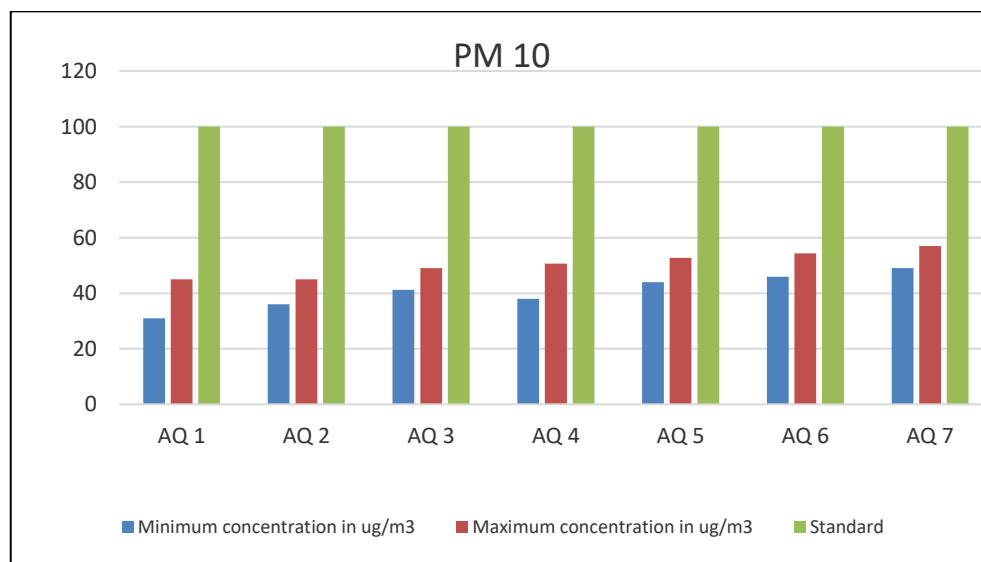


Figure 3.8 Concentration of PM10 (µg/m³) in Study Area

Project	<i>Rough stone and Gravel Quarry - 3.01.00 Ha</i>	<i>Draft EIA Report</i>
Project Proponent	<i>Thiru.N.H.M.Pandian</i>	
Project Location	<i>Anaikulam Village, Veerakeralampudur Taluk, Tenkasi District</i>	

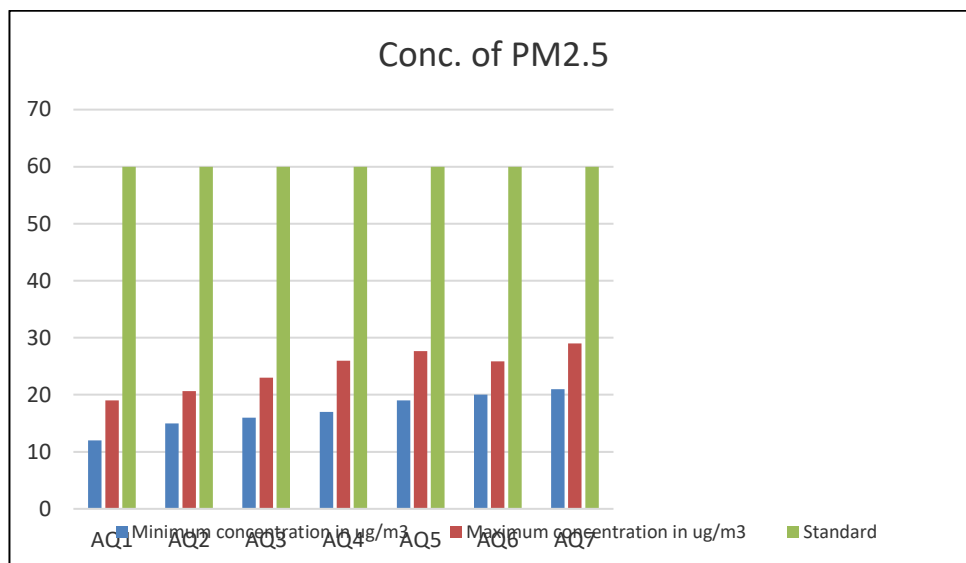


Figure 3.9 Concentration of PM2.5 ($\mu\text{g}/\text{m}^3$) in Study Area

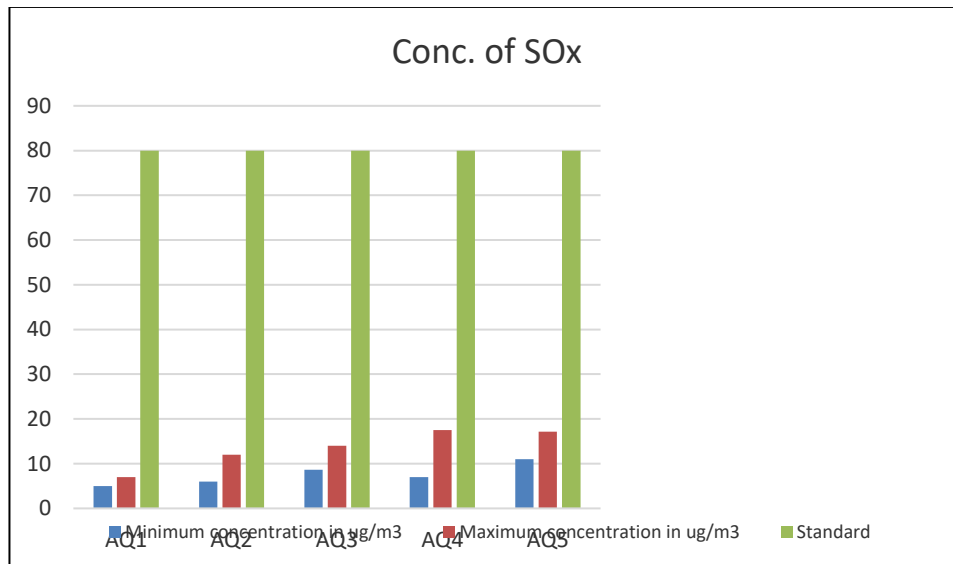


Figure 3.10 Concentration of SOx ($\mu\text{g}/\text{m}^3$) in Study Area

Project	Rough stone and Gravel Quarry - 3.01.00 Ha	Draft EIA Report
Project Proponent	Thiru.N.H.M.Pandian	
Project Location	Anaikulam Village, Veerakeralampudur Taluk, Tenkasi District	

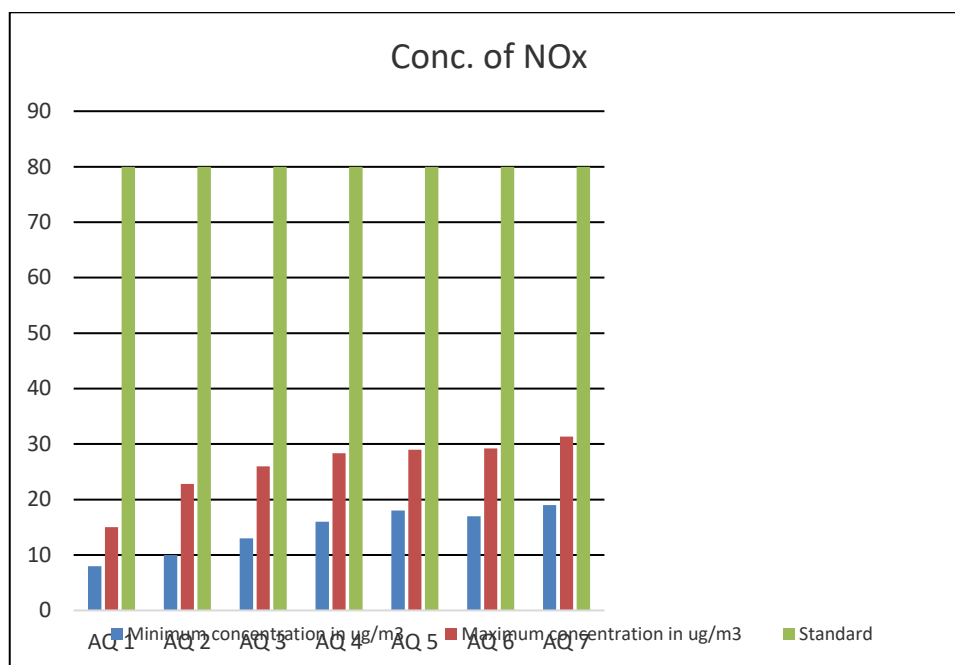


Figure 3.11 Concentration of NOx (ug/m3) in Study Area

3.5 NOISE ENVIRONMENT:

Table 3-10 Noise Analysis

Environmental Parameters: <i>Noise Analysis</i>	
Monitoring Period	December 2023 to February 2024
Design Criteria	Based on the Sensitivity of the area
Monitoring Locations	Project Site – N 1 Sri Pillaiyar Kovil, Melakaangal – N 2 KS Bricks Factory, E.Meenachipuram, Surandai – N 3 P.J.Sweet, Kadayanallur Road, Sendamaram – N 4 Milagudaiyar Sastha Kovil, Uthumalai – N 5 Karuppasamy.pechi amman kovil, Sendamaram – N 6 Trumalaiandi garden LPM, Vadiyur – N 7

Project	<i>Rough stone and Gravel Quarry - 3.01.00 Ha</i>	<i>Draft EIA Report</i>
Project Proponent	<i>Thiru.N.H.M.Pandian</i>	
Project Location	<i>Anaikulam Village, Veerakeralampudur Taluk, Tenkasi District</i>	

Methodology	Noise level measurements were taken at the selected locations using noise level meter both during day and nighttime. Noise level measurements were taken continuously for 24 hours at hourly intervals
Frequency of Monitoring	Noise samples were collected from 7 locations - Once in a season

Ambient Noise Levels are monitored in the chosen 7 Locations including the project Site and the monitoring results are summarized below.

3.5.1 *Maximum Day and Night Noise Level (Leq day)*

Table 3-11 Noise Level (Leq)

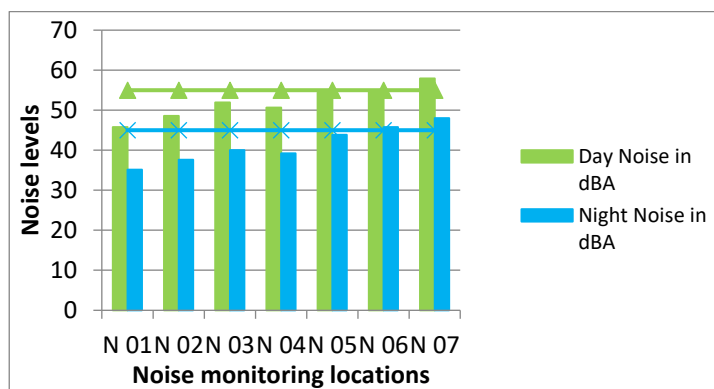
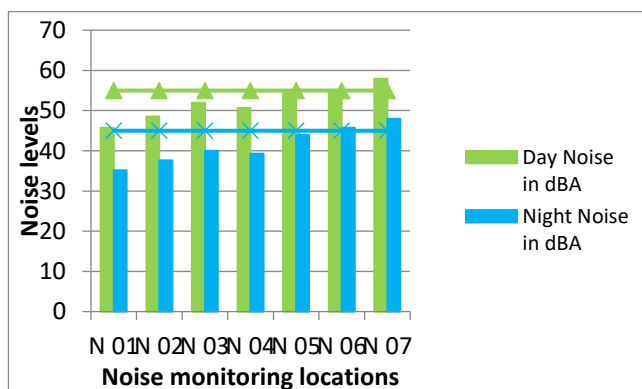
Location	Leq in dB(A)		
	Max in Day	Max in Night	Average
Project Site	49	39	46
Sri Pillaiyar Kovil, Melakaangal	54	44	51
KS Bricks Factory, E. Meenachipuram, Surandai	59	50	55
P.J. Sweet, Kadayanallur Road, Sendamaram	61	53	58
Milagudaiyar Sastha Kovil, Uthumalai	55	46	52
Karuppasamy.pechi amman kovil, Sendamaram	53	43	49
Trumalaiandi garden LPM, Vadiyur	59	50	54

3.5.2 *Night Noise Level (Leq Night)*

Project	Rough stone and Gravel Quarry - 3.01.00 Ha	Draft EIA Report
Project Proponent	Thiru.N.H.M.Pandian	
Project Location	Anaikulam Village, Veerakeralampudur Taluk, Tenkasi District	

Table 3-12 Noise Level (Leq)

Location	Leq Night in dB(A)		
	Max in Day	Min in Night	Average
Project Site	39	32	35
Sri Pillaiyar Kovil, Melakaangal	43	35	39
KS Bricks Factory, E. Meenachipuram, Surandai	50	41	46
P.J.Sweet, Kadayanallur Road, Sendamaram	52	44	48
Milagudaiyar Sastha Kovil, Uthumalai	44	37	40
Karuppasamy.pechi amman kovil, Sendamaram	42	34	38
Trumalaiandi garden LPM, Vadiyur	48	40	44



Noise Level (Leq) – Maximum Day and Night

Noise Level (Leq) – Minimum Day and Night

Observation:

The maximum Day noise and Night noise were found to be 61 dB(A) and 52 dB(A) respectively in P.J.Sweet, Kadayanallur Road, Sendamaram. The minimum Day Noise and Night noise were 39 dB (A) and 32 dB(A) respectively which was observed in Project site. The observed values are all well within the Standards prescribed by CPCB.

Project	Rough stone and Gravel Quarry - 3.01.00 Ha	Draft EIA Report
Project Proponent	Thiru.N.H.M.Pandian	
Project Location	Anaikulam Village, Veerakeralampudur Taluk, Tenkasi District	

3.6 SOIL ENVIRONMENT

Soil environment is studied for 10 km radius from the project site. The 5 km radius image shows that the soil is not affected by any kind of erosion.

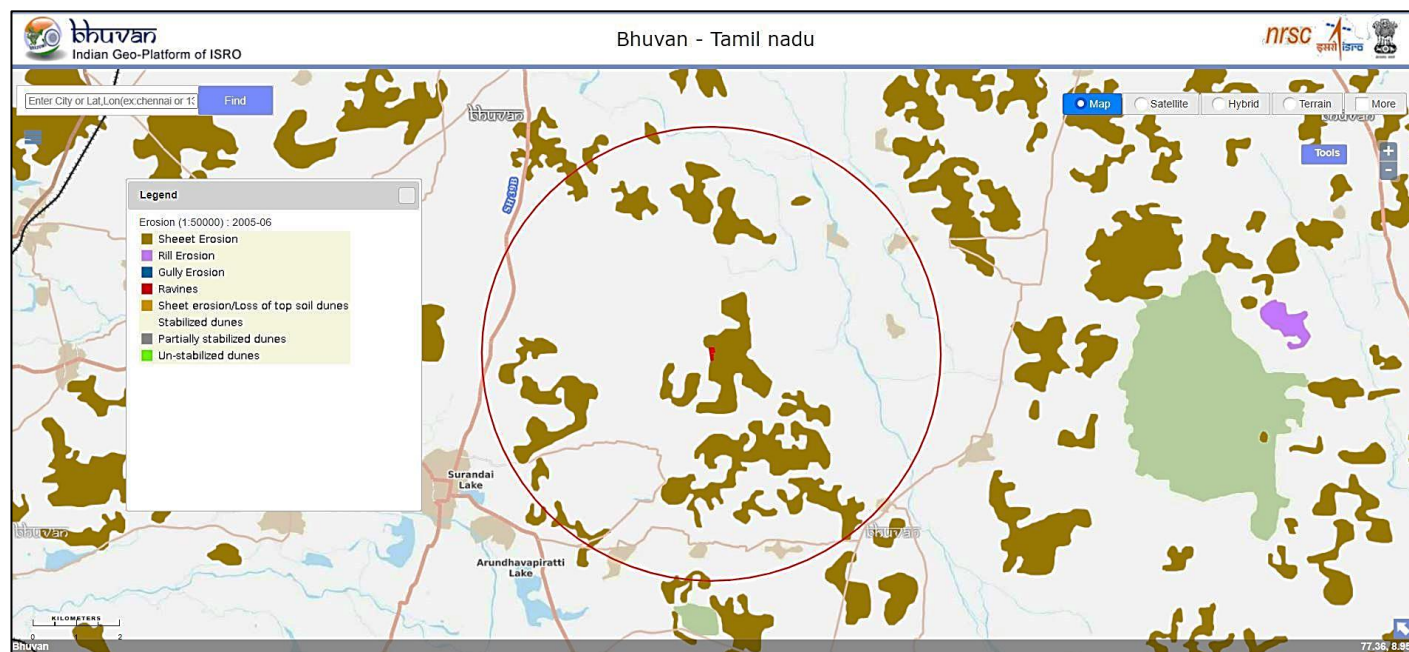


Figure 3.12 Soil Erosion pattern within 5 km radius of the project site.

3.6.1 Baseline Data:

The present study of the soil quality establishes the baseline characteristics which will help in future in identifying the incremental concentrations if any, due to the operation Phase of the proposed project. The sampling locations have been identified with the following objectives:

- To determine the impact of proposed project on soil characteristics and
- To determine the impact on soils more importantly from agricultural productivity point of view.

Table 3-13 Soil Quality Analysis

Environmental Parameters: <i>Soil Quality Analysis</i>	
Monitoring Period	December 2023 to February 2024
Design Criteria	Based on the environmental settings of the study area
Monitoring Locations	Project Site – SQ 1

Project	<i>Rough stone and Gravel Quarry - 3.01.00 Ha</i>	<i>Draft EIA Report</i>
Project Proponent	<i>Thiru.N.H.M.Pandian</i>	
Project Location	<i>Anaikulam Village, Veerakeralampudur Taluk, Tenkasi District</i>	

	Sri Pillaiyar Kovil, Melakaangal – SQ 2 KS Bricks Factory, E.Meenachipuram, Surandai – SQ 3 P.J.Sweet, Kadayanallur Road, Sendamaram – SQ 4 Milagudaiyar Sastha Kovil, Uthumalai – SQ 5 Karuppasamy.pechi amman kovil, Sendamaram – SQ 6 Trumalaiandi garden LPM, Vadiyur – SQ 7
Methodology	Composite soil samples using sampling augers and field capacity apparatus
Frequency of Monitoring	Soil samples were collected from 7 locations Once in a season

To assess the soil quality of the study area, 5 monitoring stations were selected and the results are summarized below.

Table 3-14 Soil Quality Analysis

Parameters	Unit	SQ 1	SQ 2	SQ 3	SQ 4	SQ 5	SQ 6	SQ 7
pH (at 25°C)	-	7.58	7.86	6.92	6.99	7.33	7.71	6.89
Specific Electrical Conductivity	mS/cm	0.09	0.14	0.28	0.08	0.35	0.14	0.06
Water Holding Capacity	ml/l	1.6	3.1	1.8	1.3	1.8	2.7	1.8
Chloride	g/cm ³	26.4	29.0	31.0	29.1	23.8	28.1	21.4
Soluble Calcium	mg/kg	164	87.0	151	174	99	165	129
Soluble Sodium	mg/kg	656	456	413	662	493	618	386
Soluble Potassium	mg/kg	418	452	337	520	464	506	328
Organic matter	%	0.25	0.45	0.21	0.30	0.31	0.26	0.42
Magnesium	mg/kg	197	68.5	75.5	108	72.5	103	90.0
Sulphates	mg/kg	89.3	95.3	249	81.2	89.0	91.4	82.0

Project	<i>Rough stone and Gravel Quarry - 3.01.00 Ha</i>	<i>Draft EIA Report</i>
Project Proponent	<i>Thiru.N.H.M.Pandian</i>	
Project Location	<i>Anaikulam Village, Veerakeralampudur Taluk, Tenkasi District</i>	

Cation Exchange Capacity	mg/kg	11.6	8.92	10.6	11.5	9.8	14.2	12.6
Carbonate	mg/kg	NIL	NIL	NIL	NIL	NIL	NIL	NIL
Bicarbonate	mg/kg	136	67.7	49.6	73.4	42	96.8	68.5
Total Kjeldahl Nitrogen	%	0.21	0.45	0.31	0.20	0.29	0.32	0.32
Bulk Density	meq/ 100g	1.24	1.52	1.62	1.50	1.25	1.31	1.52
Phosphorous	meq/kg	134	162	143	126	152	154	146
Sand	%	48.8	49.3	49.0	53.4	54.9	49.7	55.5
Clay	mg/kg	4.9	4.6	4.9	20.0	4.1	5.0	4.1
Silt	mg/kg	46.4	46.1	46.1	26.6	41.0	45.3	40.5
SAR	mg/kg	8.17	8.88	6.85	9.72	9.19	9.3	6.38
Silicon	%	0.099	0.095	0.093	0.091	0.081	0.086	0.087

3.6.1.1 Physical Properties:

Regular cultivation practices increase the bulk density of soils thus inducing compaction. This results in reduction in water percolation rate and penetration of roots through soils. The soils with low bulk density have favorable physical conditions whereas those with high bulk density exhibit poor physical conditions for agriculture crops. The bulk density of the soil in the study area ranged between 1.24 to 1.62 g/cm³ which indicates favorable physical condition for plant growth. The water holding capacity was found in the range of 1.3 ml/l to 3.1 ml/l.

3.6.1.2 Chemical Properties:

Chemical characteristics of soils include pH, exchangeable cations and fertility status in the form of NPK values and organic matter. The value of the pH ranges from 6.89 to 7.86, which it indicates majority of pH of the soil is slightly alkaline. The soil in the project site is sodic in nature, which challenges because they tend to have very poor structure which limits or prevents water infiltration and drainage. The organic matter varies from 0.21 to 0.42 %, which indicates the soil is slightly unfertile.

Project	<i>Rough stone and Gravel Quarry - 3.01.00 Ha</i>	<i>Draft EIA Report</i>
Project Proponent	<i>Thiru.N.H.M.Pandian</i>	
Project Location	<i>Anaikulam Village, Veerakeralampudur Taluk, Tenkasi District</i>	

3.7 ECOLOGY AND BIODIVERSITY

Ecology and Biodiversity is studied for 10 km radius around the project site. Project site and 2 km around the project site is considered as core zone and from 2 km to 10 km radius, it is considered as buffer zone.

- Primary field survey is carried out for the assessment of flora and fauna in the core zone.
- Secondary data from Journals/Literature were studied and compiled to understand the species present in the buffer zone.

3.7.1 Methods available for floral analysis:

3.7.1.1 Plot Sampling Methods

- Quadrat – 2D shape (e.g. square or rectangle, or other shape) used as a sampling unit
- Transect
 - Line transects feature only a length dimension, usually defined by a tape stretched across the area to be sampled.
 - Belt transects have a width as well as length.
 - Pace-transects are established when the observer strides along an imaginary line across the sample site and uses their foot placement to determine specific sampling points.

3.7.1.2 Plot less Sampling Methods

- Closest individual method - Distance is measured from each random point to the nearest individual.
- Nearest neighbour method - Distance is measured from an individual to its nearest neighbour.
- Random pairs method - Distance is measured from one individual to another on the opposite side of the sample point.
- Point-centered quarter (PCQ) method - Distance is measured from the sampling point to the nearest individual in each quadrat.

3.7.2 Field study & Methodology adopted:

To assess the suitability of the methodology, random field survey was done. Field survey was conducted around 2 km radius from the project site and five locations were chosen based on the species density.

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Quadrat method is chosen for the proposed study as compared to other sampling methods, because they are relatively simple to use. Quadrat plots are uniform in size and shape and distributed randomly throughout the sample area, which makes the study design straightforward. They are also one of the most affordable techniques because they require very few materials.

3.7.3 Study outcome:

Phyto-sociological parameters, such as ***Density, Frequency, Basal Area, Abundance and Importance Value Index*** of individual species (Trees) were determined in randomly placed quadrat of different sizes in the study area. Relative frequency, relative basal area and relative density were calculated and the sum of these three represented Importance Value Index (IVI) for various species. For shrubs, herbs and grasses, ***Density, Frequency, Relative Density & Relative Frequency were found.***

Sample plots were selected in such a way to get maximum representation of different types of vegetation and plots were laid out in different part of the study area of 2 km radius. Analysis of the vegetation will help in determining the relative importance of each species in the study area and to reveal if any economically valuable species is threatened in the process.

Table 3-15 Calculation of Density, Frequency (%), Dominance, Relative Density, Relative Frequency, Relative Dominance & Important Value Index

Parameters	Formula
Density	Total No. of individuals of species/ Total No. of Quadrats used in sampling
Frequency (%)	(Total No. of Quadrats in which species occur/ Total No. of Quadrats studied) * 100
Dominance	Total Basal Area /Total area sampled
Abundance	Total No. of individuals of species/ No. of Quadrats in which they occur
Relative Density	(Total No. of individuals of species/Sum of all individuals of all species) * 100
Relative Frequency	(Total No. of Quadrats in which species occur/ Total No. of Quadrats occupied by all species) * 100
Relative Dominance	Dominance of a given species/Total Dominance of all species
Important Value Index	Relative Density + Relative Frequency + Relative Dominance

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Table 3-16 Tree Species in the core Zone

S. No.	Scientific Name	Local Name	Total No. of species	Total of Quadrants with species	Total No. of Quadrants	Density	Frequency (%)	Abundance	Dominance	Relative Density	Relative Frequency	Relative Dominance	IVI	IUCN Conservation Status
1	Ficus Carica	Athi Maram	2	2	6	0.33	33.33	1	0.28	1.68	2.17	4.45	8.31	Least Concern
2	Cocos nucifera	Thennai	10	6	6	1.67	100.0	1.67	0.15	8.40	6.52	2.39	17.32	Not assessed
3	Azadirachta indica	Veppam	17	6	6	2.83	100.0	2.83	0.13	14.29	6.52	1.98	22.79	Not assessed
4	Tamarindus indica	Puli	10	6	6	1.67	100.0	1.66	0.20	8.40	6.52	3.09	18.02	Not assessed
5	Mangifera indica	Mamaram	7	6	6	1.17	100.0	1.16	0.07	5.88	6.52	1.11	13.52	Data insufficient
6	Morinda pubescens	Nuna	6	6	6	1.00	100.0	1	0.24	5.04	6.52	3.74	15.31	Not assessed
7	Couroupita guianensis	Nagalingam	5	3	6	0.83	50.00	1.67	0.14	4.20	3.26	2.18	9.64	Not assessed
8	Bombax ceiba	Sittan	4	4	6	0.67	66.67	1	0.08	3.36	4.35	1.27	8.98	Not assessed
9	Acacia nilotica	Karuvelai	4	4	6	0.67	66.67	1	0.28	3.36	4.35	4.45	12.16	Least Concern
10	Bambusa vulgaris	Moongil	4	4	6	0.67	66.67	1	0.50	3.36	4.35	7.92	15.63	Not assessed
11	Syzygium cumini	naval	5	1	6	0.83	16.67	5	0.11	4.20	1.09	1.79	7.07	Not assessed
12	Carica papaya	Papaya	3	3	6	0.50	50.00	1	0.09	2.52	3.26	1.43	7.21	Not assessed
13	Psidium guajava	Guava	3	3	6	0.50	50.00	1	0.23	2.52	3.26	3.61	9.39	Not assessed
14	Cassia siamea	ManjalKonrai	3	2	6	0.50	33.33	1.5	0.07	2.52	2.17	1.11	5.81	Least Concern
15	Ficus religiosa	Arasa maram	3	3	6	0.50	50.00	1	0.09	2.52	3.26	1.35	7.13	Not assessed

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16	Musa paradise	Vaazhai	3	3	6	0.50	50.00	1	0.08	2.52	3.26	1.19	6.97	Not assessed
17	Prosopis juliflora	Vaelikaruvai	3	3	6	0.50	50.00	1	0.21	2.52	3.26	3.34	9.13	Not assessed
18	Tectona grandis	Thekku	3	3	6	0.50	50.00	1	0.12	2.52	3.26	1.88	7.66	Not assessed
19	Thespesia populnea	Poovarasam	3	3	6	0.50	50.00	1	0.15	2.52	3.26	2.39	8.18	Not assessed
20	Causuarina equisetifolia	Savukku	2	2	6	0.33	33.33	1	0.21	1.68	2.17	3.34	7.20	Not assessed
21	Alstonia scholaris	Elilaipalai	2	2	6	0.33	33.33	1	0.27	1.68	2.17	4.31	8.16	Least Concern
22	Anacardium occidentale	Cashew	1	1	6	0.17	16.67	1	0.44	0.84	1.09	6.96	8.88	Not assessed
23	Artocarpus heterophyllus	Palaa	2	2	6	0.33	33.33	1	0.18	1.68	2.17	2.85	6.70	Not assessed
24	Aegle marmelos	Vilvam	1	1	6	0.17	16.67	1	0.16	0.84	1.09	2.50	4.43	Not assessed
25	Delonix elata	Perungondrai	1	1	6	0.17	16.67	1	0.17	0.84	1.09	2.62	4.54	Least Concern
26	Pithecellobium dulce	Kodukapuli	1	1	6	0.17	16.67	1	0.14	0.84	1.09	2.18	4.11	Not assessed
27	Citrus medica	Elumichai	2	2	6	0.33	33.33	1	0.23	1.68	2.17	3.61	7.46	Not assessed
Total			110	83					5.02					

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Table 3-17 Shrubs in the Core Zone

S. No.	Scientific Name	Local Name	Total No. of species	Total of Quadrants with species	Total No. of Quadrants	Density	Frequency (%)	Abundance	Relative Density	Relative Frequency	IUCN Conservation Status
1	Jatropagossypifolia	Kaatamanaku	32	17	24	1.17	0.71	1.65	14.43	17.17	Not Assessed
2	Calotropis gigantea	Erukam	16	12	24	0.58	0.50	1.17	7.22	12.12	Not Assessed
3	Tabernaemontanadivaricata	Crepe Jasmine	4	3	24	0.13	0.13	1	1.55	3.03	Not Assessed
4	Catharanthus roseus	Nithyakalyani	4	3	24	0.13	0.13	1	1.55	3.03	Not Assessed
5	Datura metal	Ummattangani	7	4	24	0.21	0.17	1.25	2.58	4.04	Not Assessed
6	Robiniapseudoacacia	Black locust	15	5	24	0.71	0.21	3.4	8.76	5.05	Least Concern
7	Acalypha indica	Kuppaimeni	18	8	24	0.83	0.33	2.5	10.31	8.08	Not Assessed
8	Stachytarpeaurticifolia	Rat tail	13	9	24	0.63	0.38	1.67	7.73	9.09	Not Assessed
9	Woodfordiafruticosa	Velakkai	4	3	24	0.13	0.13	1	1.55	3.03	Least Concern
10	Hibiscus rosa sinensis	Sembaruthi	3	2	24	0.13	0.08	1.5	1.55	2.02	Not Assessed
11	Lantana camara	Unnichedi	8	6	24	0.38	0.25	1.5	4.64	6.06	Not Assessed
12	Parthenium hysterophorous	Vishapoondur	45	13	24	2.08	0.54	3.85	25.77	13.13	Not Assessed
13	Euphorbia geniculata	Amman Pacharisi	5	3	24	0.13	0.13	1	1.55	3.03	Not Assessed

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Table 3-18 Herbs & Grasses in the core zone

S. No.	Scientific Name	Local Name	Total No. of species	Total of Quadrants with species	Total No. of Quadrants	Density	Frequency (%)	Abundance	Relative Density	Relative Frequency	IUCN Conservation status
1	Helicteresisora	Valampuri	4	2	30	0.07	0.07	1	0.79	2.15	Not assessed
2	Tridax procumbens	Vettukaayathalai	7	4	30	0.17	0.13	1.25	1.98	4.30	Not assessed
3	Heraculem spondylium	Hog Weed	19	10	30	0.67	0.33	2	7.94	10.75	Not assessed
4	Tridax procumbens	Cuminipachai	18	4	30	0.50	0.13	3.75	5.95	4.30	Not assessed
5	Senna occidentalis	Nattamsakarai	30	4	30	0.83	0.13	6.25	9.92	4.30	Not assessed
6	Plumbago zeylanica	Chittiramoolam	12	3	30	0.10	0.10	1	1.19	3.23	Not assessed
7	Scrophularia nodosa	Sarakkothini	18	7	30	0.50	0.23	2.14	5.95	7.53	Not assessed
8	Viburnum dentatum	Viburnum	7	5	30	0.17	0.17	1	1.98	5.38	Least concern
9	Cynodondactylon	Arugu	15	6	30	0.40	0.20	2	4.76	6.45	Not assessed
10	Euphorbia hirta	Amman Pacharisi	7	4	30	0.17	0.13	1.25	1.98	4.30	Not assessed
11	Sida cordifolia	Maanikham	50	4	30	1.50	0.13	11.25	17.86	4.30	Not assessed
12	Sida acuta	Malaidangi	12	3	30	0.33	0.10	3.33	3.97	3.23	Not assessed
13	Laportea canadensis	Peruganchori	28	20	30	1.00	0.67	1.5	11.90	21.51	Not assessed
14	Sporobolus fertilis	Giant Parramatta Grass	10	4	30	0.30	0.13	2.25	3.57	4.30	Not assessed
15	Tephrosia purpurea	Kavali	23	4	30	0.67	0.13	5	7.94	4.30	Not assessed

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3.7.4 Calculation of species diversity by Shannon – wiener Index, Evenness and richness by Margalef:

Biodiversity index is a quantitative measure that reflects how many different type of species, there are in a dataset, and simultaneously takes into account how evenly the basic entities (such as individuals) are distributed among those types of species. The value of biodiversity index increases both when the number of types increases and when evenness increases. For a given number of type of species, the value of a biodiversity index is maximized when all type of species are equally abundant. Interpretation of Vegetation results in the study area is given below.

Table 3-19 Calculation of species diversity

Description	Formula
Species diversity – Shannon – Wiener Index	$H = \sum [(p_i) * \ln(p_i)]$ Where p_i : Proportion of total sample represented by species i : number of individuals of species i / total number of samples
Evenness	$H/H_{\max}$ $H_{\max} = \ln(s) =$ maximum diversity possible $S =$ No. of species
Species Richness by Margalef	$RI = S - 1 / \ln N$ Where S = Total Number of species in the community N = Total Number of individuals of all species in the community

3.7.5 Calculation of species diversity by Shannon – wiener Index, Evenness and richness by Margalef for trees

i. Species Diversity

Scientific Name	Common Name	No. of Species	Pi	ln (Pi)	Pi x ln (Pi)
Ficus Carica	Athi Maram	2	0.018182	-4.00733	-0.07286
Cocos nucifera	Thennai	10	0.090909	-2.3979	-0.21799

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Azadirachta indica	Veppam	17	0.154545	-1.86727	-0.28858
Tamarindus indica	Puli	10	0.090909	-2.3979	-0.21799
Mangifera indica	Mamaram	7	0.063636	-2.75457	-0.17529
Morinda pubescens	Nuna	6	0.054545	-2.90872	-0.15866
Couroupita guianensis	Nagalingam	5	0.045455	-3.09104	-0.1405
Bombax ceiba	Sittan	4	0.036364	-3.31419	-0.12052
Acacia nilotica	Karuvelai	4	0.036364	-3.31419	-0.12052
Bambusa vulgaris	Moongil	4	0.036364	-3.31419	-0.12052
Syzygium cumini	naval	5	0.045455	-3.09104	-0.1405
Carica papaya	Papaya	3	0.027273	-3.60187	-0.09823
Psidium guajava	Guava	3	0.027273	-3.60187	-0.09823
Cassia siamea	ManjalKonrai	3	0.027273	-3.60187	-0.09823
Ficus religiosa	Arasa maram	3	0.027273	-3.60187	-0.09823
Musa paradise	Vaazhai	3	0.027273	-3.60187	-0.09823
Prosopis juliflora	Vaelikaruvai	3	0.027273	-3.60187	-0.09823
Tectona grandis	Thekku	3	0.027273	-3.60187	-0.09823
Thespesia populnea	Poovarasam	3	0.027273	-3.60187	-0.09823
Causuarina equisetifolia	Savukku	2	0.018182	-4.00733	-0.07286
Alstonia scholaris	Elilaipalai	2	0.018182	-4.00733	-0.07286
Anacardium occidentale	Cashew	1	0.009091	-4.70048	-0.04273
Artocarpus heterophyllus	Palaa	2	0.018182	-4.00733	-0.07286
Aegle marmelos	Vilvam	1	0.009091	-4.70048	-0.04273
Delonix elata	Perungondrai	1	0.009091	-4.70048	-0.04273
Pithecellobium dulce	Kodukapuli	1	0.009091	-4.70048	-0.04273
Citrus medica	Elumichai	2	0.018182	-4.00733	-0.07286
Total		110			-3.02215005

H (Shannon Diversity Index) =3.02

Shrubs

Scientific Name	Common Name	No. of Species	Pi	ln (Pi)	Pi x ln (Pi)
Jatropagossypifolia	Kaatamanaku	32	0.183908	-1.69332	-0.31142
Calotropis gigantea	Erukam	16	0.091954	-2.38647	-0.21945
Tabernaemontanadivaricata	Crepe Jasmine	4	0.022989	-3.77276	-0.08673
Catharanthus roseus	Nithyakalyani	4	0.022989	-3.77276	-0.08673
Datura metal	Ummattangani	7	0.04023	-3.21315	-0.12926
Robiniapseudoacacia	Black locust	15	0.086207	-2.45101	-0.21129
Acalypha indica	Kuppaimeni	18	0.103448	-2.26868	-0.23469
Stachytarphaeurticifolia	Rat tail	13	0.074713	-2.59411	-0.19381
Woodfordiafruticosa	Velakkai	4	0.022989	-3.77276	-0.08673
Hibiscus rosa sinensis	Sembaruthi	3	0.017241	-4.06044	-0.07001

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Lantana camara	Unnichedi	8	0.045977	-3.07961	-0.14159
Parthenium hysterophorous	Vishapoondur	45	0.258621	-1.35239	-0.34976
Euphorbia geniculata	Amman Pacharisi	5	0.028736	-3.54962	-0.102
Total		174			-2.2234

H (Shannon Diversity Index) =2.22

Herbs

Scientific Name	Common Name	No. of Species	Pi	ln (Pi)	Pi x ln (Pi)
Helicteresisora	Valampuri	4	0.015385	-4.17439	-0.06422
Tridax procumbens	Vettukaayathalai	7	0.026923	-3.61477	-0.09732
Heraculem spondylium	Hog Weed	19	0.073077	-2.61624	-0.19119
Tridax procumbens	Cuminipachai	18	0.069231	-2.67031	-0.18487
Senna occidentalis	Nattamsakarai	30	0.115385	-2.15948	-0.24917
Plumbago zeylanica	Chittiramoolam	12	0.046154	-3.07577	-0.14196
Scrophularia nodosa	Sarakkothini	18	0.069231	-2.67031	-0.18487
Viburnum dentatum	Viburnum	7	0.026923	-3.61477	-0.09732
Cynodondactylon	Arugu	15	0.057692	-2.85263	-0.16457
Euphorbia hirta	Amman Pacharisi	7	0.026923	-3.61477	-0.09732
Sida cordifolia	Maanikham	50	0.192308	-1.64866	-0.31705
Sida acuta	Malaidangi	12	0.046154	-3.07577	-0.14196
Laportea canadensis	Peruganchori	28	0.107692	-2.22848	-0.23999
Sporobolus fertilis	Giant Parramatta Grass	10	0.038462	-3.2581	-0.12531
Tephrosia purpurea	Kavali	23	0.088462	-2.42519	-0.21454
Total		260			-2.51

H (Shannon Diversity Index) =2.51

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i. Species diversity calculation

Details	H	Hmax	Evenness	Species Richness (Margalef)
Trees	3.02	3.36	0.89	5.95
Shrubs	2.22	2.56	0.86	2.32
Herbs	2.51	2.70	0.92	2.51

From the above, it can be interpreted that herb community has higher diversity. While the tree community shows less diversity. It is also observed that most of the quadrates have controlled generation of plant species with older strands. Higher herb species diversity can be interpreted as a greater number of successful species and a more stable ecosystem where more ecological niches are available, environmental change is less likely to be damaging to the ecosystem. Species richness is high for herb community when compared with tree and shrubs.

3.7.6 *Floral study in the Buffer Zone:*

Economically important Flora of the study area

Agricultural crops: The important crops of this district are Paddy, Maize, Ragi, Banana, Sugarcane, Cotton, Tamarind, Coconut, Mango, Groundnut, Vegetables and Flowers also grown by the local people.

Medicinal species: The nearby area is also endowed with the several medicinal species which are commonly available in the shrub forest and waste lands. The common medicinal species of the region are Asparagus racemosus (satamulli), Azadirachta indica (Neem) etc.

Rare and endangered floral species: There are no rare or endangered or threatened (RET) species of in the study area. During the vegetation survey, there are no any species which are endangered or threatened under IUCN (International Union for Conservation of Nature and Natural resources) guidelines.

3.7.7 *Faunal Communities*

Both direct and indirect observation methods were used to survey the fauna.

➤ Point Survey Method: Observations were made in each site for 15 minutes duration.

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Roadside Counts: The observer traveled by motor vehicles from site to site, all sightings were recorded (this was done both in the day and night time). An index of abundance of each species was also established.

Pellet and Track Counts: All possible animal tracks and pellets were identified and recorded (South Wood, 1978).

Additionally, survey of relevant literature was also done to consolidate the list of fauna distributed in the buffer zone.

Based on the Wildlife Protection Act, 1972 (WPA 1972, Anonymous. 1991, Upadhyay 1995, Chaturvedi and Chaturvedi 1996) species were short-listed as Schedule II or I and considered herein as endangered species. Species listed in Ghosh (1994) are considered as Indian Red List species.

Methodology Adopted:

The Point Survey method was adopted for this development project where observations were made in each site for 15 minutes duration (10 times).

Study in the core zone:

The Point Survey method was adopted for the study within 2 km radius and the following species were observed.

Mammals: No wild mammalian species was directly sighted during the field survey. Discussion with local villagers located around the study area also could not confirm presence of any wild animal in that area. Three striped Palm Squirrel, Common Indian Hare, Common mongoose, Common Mouse etc were observed during primary survey.

Avifauna: Since birds are considered to be the indicators for monitoring and understanding human impacts on ecological systems (Lawton, 1996) attempt was made to gather quantitative data on the avifauna by walk through survey within the entire study area and surrounding areas. From the primary survey, a total of 26 species of avifauna were identified and recorded in the study area. The diversity of avifauna from this region was found to be quite high and encouraging.

The list of fauna species found in the study area is mentioned in Table below.

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Table 3-20 List of fauna species

Scientific Name	Common Name	Schedule of wildlife protection act	IUCN conservation status
Mammals			
Funambulus pennanti	Palm Squirrel	IV	Least Concern
Mus rattus	Indian rat	IV	Not listed
Bandicota bengalensis	Indian mole rat	IV	Least Concern
Funambulus palmarum	Three stripped palm squirrels	IV	Least Concern
Herestes edwardsii	Common Mongoose	IV	Not listed
Mus musculus	Common Mouse	IV	Least Concern
Bandicota indica	Rat	IV	Least Concern
Lepus nigricollis	Indian Hare	IV	Least Concern
Felis catus	Cat	Not listed	Not listed
Canis lupus familiaris	Indian dog	Not listed	Not listed
Bos Indicus	Indian Cow	Not listed	Not listed
Bubalus bubalis	Buffalo	I	Not listed
Sus scrofa domesticus	Domestic pig	Not listed	Not listed
Birds			
Milvus migrans	Black kite	IV	Least concern
Saxicoloides fulicatus	Indian Robin	IV	Least concern
Pycnonotus cafer	Red vented Bulbul	IV	Least concern
Phragamaticola aedon	Thick billed warbler	IV	Least concern
Pericrocotus cinnamomeus	Small Minivet	IV	Least concern
Eudynamys scolopaceus	Koel	IV	Least concern
Psittacula krameni	Rose ringed parakeet	IV	Least concern
Dicrurus marcocercus	Black drongo	IV	Least concern
Columba livia	Rock pigeon	IV	Least concern
Corvus splendens	House crow	IV	Least concern

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Alcedo atthis	Small blue kingfisher	IV	Least concern
Cuculus canorus	Common Cukoo	IV	Least concern
Reptiles & Amphibians			
Chameleon zeylanicum	Chameleon	IV	Not listed
Calotes versicolor	Common garden lizard	II	Not listed
Bungarus caeruleus	Common krait	IV	Not listed
Ophisops leschenaultia	Snake eyed lizard	--	Not listed
Bufo melanostictus	Toad	IV	Least concern
Ptyas mucosa	Rat snakes	IV	Least concern
Hemidactylus sp.	House lizard	--	Not listed
Butterflies			
Danaus chrysippus	Plain Tiger	--	Not listed
Papilio demoleus	Common lime	--	Not listed
Euploea core	Common crow	--	Least concern
Danaus genutia	Common tiger	--	Not listed
Eurema brigitta	Small grass yellow	--	Least concern

3.8 DEMOGRAPHY AND SOCIO ECONOMICS

The demography survey study is done within 10km radius from the project site.

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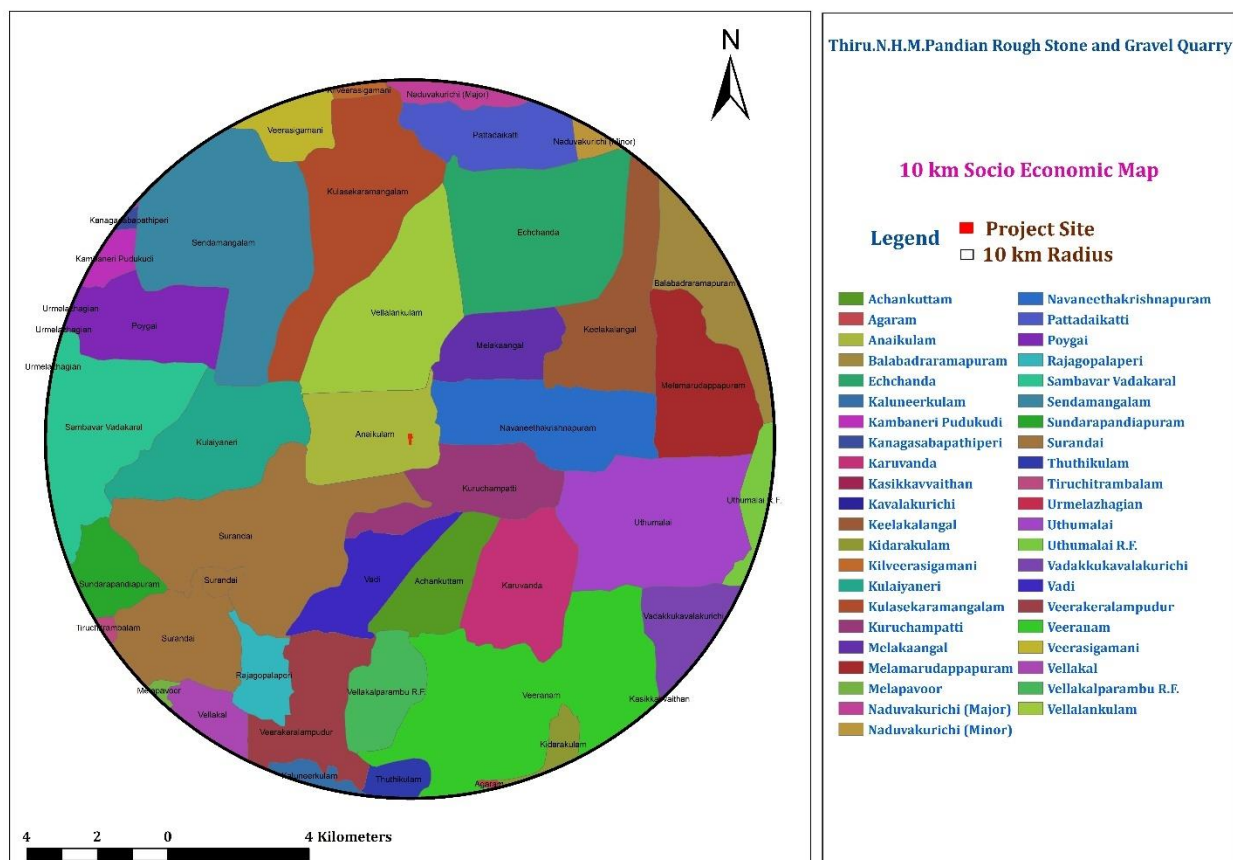


Figure 3.13 Socio Economic map surrounding the project site.

The population, Household, Sex ratio, Literacy rate, SC, ST details for all the villages in the study area is listed below:

Table 3-21: Demography Survey Study

Source: Census of India, 2011

Villages	Household	Population	Sex Ratio		Literacy Rate		SC	ST
			Male	Female	Male	Female		
Boganallur	1554	5555	2754	2801	2027	1668	2316	0
Ariyanayagipuram	1970	6956	3447	3509	2664	2200	1353	0
Veerasigamani	2262	8140	4018	4122	3089	2455	2753	3

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Kilveerasigamani	695	2558	1294	1264	979	711	453	0
Naduvakurichi (Major)	621	2257	1095	1162	799	618	296	0
Sendamangalam	4305	15613	7748	7865	6251	5105	1208	23
Sambavar Vadakarai	4423	16709	8347	8362	6159	4906	2236	35
Kambaneri Pudukudi	2272	8242	4084	4158	3071	2485	4671	1
Urmelazhagian	1612	5719	2774	2945	2153	1840	3575	0
Achampudur	3563	13566	6869	6697	5092	3908	2235	0
Kadayanallur	21076	90364	45449	44915	36013	28867	12325	382
Puliyangudi	17209	66034	32843	33191	25348	20598	11634	173
Chockampatti	4797	18220	9084	9136	6449	4829	3277	3
Madhathupatti	2228	8400	4232	4168	3153	2142	2106	0
Alangulam	47594	176138	87050	89088	67314	56480	19140	9358
Talaivankottai	1819	6470	3171	3299	2360	1821	1661	0
Ramaswamipuram	1167	3800	1848	1952	1254	915	1418	0
Punnaivanam	275	933	452	481	336	294	261	0
Kulasekaramangalam	1678	6212	3149	3063	2430	1886	1688	0
Pattadaikatti	942	3707	1918	1789	1433	1088	257	0
Vellalankulam	936	3561	1789	1772	1407	1089	533	1
Poygai	1478	5645	2856	2789	2230	1697	458	0
Kulaiyaneri	1639	6198	3056	3142	2099	1555	378	0
Kanagasabapathiperi	216	721	348	373	238	157	183	0
Nainaragaram	2611	9661	4806	4855	3741	2935	3192	16
Kilankadu	1341	4754	2370	2384	1801	1406	1624	60
Idaikal	812	3054	1534	1520	1186	940	939	15
Neduvayal	946	3618	1861	1757	1473	1159	1215	0
Kasidharmam	1281	4664	2293	2371	1752	1433	631	91

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3.9 TRAFFIC IMPACT ASSESSMENT

Traffic data collected 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 each of the two directions for counting the traffic. At the end of each hour, fresh counting and recording was undertaken. Total numbers of vehicles per hour under the three categories were determined.



Figure 3.14: Site Connectivity

Table 3-22: No. of Vehicles per Day

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S. No	Vehicles Distribution	Number of Vehicles Distribution/Day	Passenger Car Unit (PCU)	Total Number of Vehicle in PCU
		Village road	-	Village road
1	Cars	131	1	131
2	Buses	30	3	90
3	Trucks	75	3	225
4	Two wheelers	125	0.5	62
5	Three wheelers	103	1.5	154
Total		464	-	662

Table 3-23: Existing Traffic Scenario and LOS

Road	V (Volume in PCU/hr)	C (Capacity in PCU/hr)	Existing V/C Ratio	LOS
NH44	662/24=27	88	0.30	B

Note: The existing level may be “Very Good” for ODR

V/C	LOS	Performance
0.0-0.2	A	Excellent
0.2-0.4	B	Very Good
0.4-0.6	C	Good/ Average/ Fair
0.6-0.8	D	Poor
0.8-1.0	E	Very Poor

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4 Anticipated Environmental Impacts & Mitigation Measures

This chapter describes the anticipated impacts on the environment and mitigation measures. The method of assessment of impacts including studies carried out, modeling techniques adopted to assess the impacts where pertinent should be elaborated in this chapter. It should give the details of the impacts on the baseline parameters, both during the construction and operational phases and suggests the mitigation measures to be implemented by the proponent.

4.1 INTRODUCTION

An environmental impact is defined as any change to the environment, whether adverse or beneficial, resulting from a facility's activities, products, or services. The anticipation of the possible & potential Environmental impact due to the proposed project is a key step in EIA. Based on the impacts assessed, appropriate mitigation measures should be adopted to maintain the environment with less or no damage.

Environmental Impacts can be group into Primary impacts & Secondary Impacts

Primary Impacts: These impacts are directly attributed by the project.

Secondary Impacts: These are those which are induced by primary impacts and include the associated investments and changed patterns of the social and economic activities by the action.

Assessment of impacts is done for the following Environmental Parameters:

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

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4.2 LAND ENVIRONMENT:

Aspect	Impact	Mitigation Measures																
<i>Mining of rough stone and Gravel</i>	The proposed 3.01.0 Ha mine located in Anaikulam Village having 303165m³ of Rough stone and 65397 m³ of Gravel. The quarry operation is proposed to carry out with conventional open cast mechanized mining with 5.0 meter vertical bench and bench width of 5.0 meter. At the end of 5 years, mining lease area will be converted into ultimate pit. <table><tr><th>Description</th><th>Length (Max) (m)</th><th>Width (Max) (m)</th><th>Depth (Max) (m)</th></tr><tr><td>A-A' & B-B'</td><td>117</td><td>111</td><td>49.0</td></tr><tr><td>A-A' & C-C'</td><td>72</td><td>43</td><td>29.0</td></tr><tr><td>A-A' & D-D'</td><td>95</td><td>59</td><td>24.0</td></tr></table> The main impact of open cast mining on land-use is land degradation. The land is bound to be excavated for mining of Rough Stone, Jelly and Gravel Quarry.	Description	Length (Max) (m)	Width (Max) (m)	Depth (Max) (m)	A-A' & B-B'	117	111	49.0	A-A' & C-C'	72	43	29.0	A-A' & D-D'	95	59	24.0	The proposed project site is not prone to any kind of soil erosion (Source: Bhuvan). In addition, garland drainage of 1m x 1m will be provided to avoid storm water run- off. It is proposed to plant 1500 No's of local tree species (Neem, Vilvam Vaagai, Pungam, Magizha maram, Eachai, etc.) along the roads, outer periphery of the mining area which enhances the binding property of the soil. It is proposed to improve the affected land wherever possible for better land use, so as to support vegetation and creation of water reservoir in the ultimate pit after quarrying. The source of dust generation is majorly due to drilling, blasting, loading & unloading of the
Description	Length (Max) (m)	Width (Max) (m)	Depth (Max) (m)															
A-A' & B-B'	117	111	49.0															
A-A' & C-C'	72	43	29.0															
A-A' & D-D'	95	59	24.0															

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	Impact on soil of the study area will be minimal as there are no wastewater generated, heavy metal infusion, stack emissions. Impact due to transformation of terrain characteristics over the large area results in soil degradation. Solid waste will be generated from the mining activity as there will be refuse also generation of domestic waste. If it is not properly managed, may cause odor and health problem to the workers.	mined-out mineral, the impact will be mitigated by water sprinkling regularly once in 3hrs. The proposed mining activity is carried out in hilly terrain. After removal of minerals, undulating portion will be created. Excavated area or ultimate pit at the end of the mine period will be converted into water reservoir. Two tier tree belts will be planted along the safety distance. The 100% recovery is achieved by extracting the entire mineable reserve. Hence there will be no refuse generation due to the mining activity. Apart from that, a very meagre quantity of domestic waste will be generated in the project, which will be handed over to the local body on daily basis.
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4.3 WATER ENVIRONMENT:

Aspect	Impact	Mitigation Measures
<i>Drilling, Blasting, Loading and unloading,</i>	The mining in the area may cause ground water contamination due to intersection of the water table and mine runoff.	The water table will not be intersected during mining, as the ultimate depth is limited upto 49.0m (below ground level), whereas the ground

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<i>Transportation of the excavated mineral.</i>	The ground water depletion may occur due to mining activity Chemicals consisting of nitrate used for blasting may pollute the surface run off. Improper management of Domestic wastewater in the Mine lease may create unhygienic conditions in the site thereby causing health impacts to the labours.	water table is at 65 m below the ground level. The municipal wastewater will be disposed into septic tanks of 5 cum and soak pit. No chemicals consisting of toxic elements will be used for carrying out mining activity. The ground water table is at a depth of 65m BGL, the mining operation will not affect the aquifer. The ultimate pit at the end of the mining operation will be used for rainwater storage, the stored water will be used for green belt development and further the stored water will be used for domestic purposes (other than drinking) after proper treatment. Further, the run-off water will be stored in sumps and after proper treatment; water will be used in the mining operation for dust suppression. Provision of urinals/Latrines along with septic tank followed by soak pit arrangement will be provided in the Mine Lease area for the proper management of wastewater
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4.4 AIR ENVIRONMENT:

Aspect	Impact	Mitigation Measures
<i>Drilling, Blasting, Loading and unloading, Transportation of the excavated mineral.</i>	<i>Impacts during Operation Phase</i> During mining operation, fugitive dust and other air pollutants like particulate matter (PM10 & PM 2.5) will be generated. The main source of pollutants arises due to drilling and blasting. 4 Nos of Tipper will be used for loading and unloading, 2 Nos of Excavator (0.90 m³ bucket capacity, and 5 Nos Jack Hammer will be used for excavation of the mineral which contributes to the generation of fugitive dust. In addition, blasting will be done using explosives leading to the generation of dust.	<i>Mitigation Measures during Operation Phase</i> It is proposed to plant 1500 (600 trees inside the boundary & 900 trees outside the boundary) Nos of local species along the haul roads, outer periphery within the lease area to prevent the impact of dust in consultation with Forest department for the plantation of trees (Neem, Magizham, Tamarind, Elandhai and Vilvam) in two tier to combat air pollution and with herbs (Nerium) in between the tree species. Planning transportation routes of the mined out mineral, so as to reach the nearest paved roads (an approach road) by shortest route connecting to ODR. Alternatively, gravelled road may be constructed between mine lease area and nearest paved road connectivity. The speed of trucks plying on the haul road will be limited to

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	<u>Effect on Human</u> - Adverse effect on human health of working labourers and neighbouring villagers like effect on breathing and respiratory system, damage to lung tissue, influenza or asthma. - Dust generation due to loading and unloading of mineral and due to transportation can also affect the workers as well as nearby villagers. <u>Effect on Plants</u> - Stomatal index may be minimized due to dust deposit on leaf.	20km/hr to avoid generation of dust. The trucks will be covered by tarpaulin. Overloading will be avoided. Personal Protective Equipments (PPEs) like eye goggles, dust mask, leather gloves, safety shoes & boots will be provided to the workers engaged at dust generation points like excavation and loading points. 3.5 KLD of water will be proposed for sprinkling on unpaved roads to avoid dust generation during transportation.
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Air Quality Modeling:

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

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

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4.4.1 *Source Characterization*

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

The emission Sources from the proposed operation are

Point Sources:

Point sources for mining operations are typically include dust collectors, hot water heaters, and emergency generator(s). Since at the present project the following sources are anticipated.

1. Hydraulic excavator – 0.90 Cum Bucket Capacity (with Rock Breaker Attachment)
2. Jack Hammer 32 mm Dia
3. Tipper
4. Tractor Mounted - Compressor
5. Drilling and excavation with Accessories

Road 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 2023 to February 2024 emissions were estimated. Emissions due to haul road and general plant traffic on the unpaved road network were modelled as volume sources. The model volume source parameter for the haul roads initially utilized USEPA 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 were 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

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Other fugitive particulate emission sources:

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

- Fugitive emissions from trucks unloading at the primary crusher were represented by a single volume source. The release height was set to 0 meters (dump pocket is at grade level).
- Fugitive emissions due to wind erosion is not considered as the mining area is predominately rocky surface with minimal wind erosion. If an wind erosion is anticipated to occur, it would be localized.
- Fugitive emissions from transfer points were represented by single volume sources. The release heights for these sources were set to the actual height of the truck transfer process.

Post Project Scenario

Emissions from operations will result from process equipment and mining operations. Process equipment was modeled at maximum capacity. Emissions from mining were based upon the mining rate and haul truck travel necessary to transport the stones and waste from the pit to the storage area.

Predicted maximum ground level concentrations considering micro meteorological data of December 2023 to February 2024 are superimposed on the maximum baseline concentrations obtained during the study period to estimate the post project scenario, which would prevail at the post operational phase. The overall scenario with predicted concentrations over the maximum baseline concentrations is shown in the following table along with isopleths.

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Table 4-1 Emission Factors for uncontrolled mining

Activity	Emission Factor		References	
Topsoil handling	Scraper	0.029 Kg TSPM/ average time between spray application	USEPA (2008)	Jose I. Huertas & Dumar A. Camacho & Maria E. Huertas, Standardized emissions inventory methodology for open-pit mining areas, Environmental Science Pollution Research, 2012.
	Bulldozing	15.048 kg PM10/ Hr excavation	USEPA (2008)	
	Loading	2.3237E-04 kg PM10/ average time between spray application	USEPA (2006a)	
	Haulage	0.69718 kg PM10/VKT	USEPA (2006a) Cowherd (1988)	
Rough stone mining	Wet drilling	8.00E-5 lbs PM10/ Ton produce	EPA. August, 2004. Section 11.19.2, Crushed Stone Processing and Pulverized Mineral Processing. In: Compilation of Air Pollutant Emission Factors, Volume 1: Stationary Point and Area Sources, Fifth Edition, AP-42. U.S. Environmental Protection Agency, Office of Air Quality Planning and Standards. Research Triangle Park, North Carolina.	
	Loading	1.00E-4 lbs PM10/ Ton produce		

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4.5 NOISE ENVIRONMENT:

Aspect	Impact	Mitigation Measures
<i>Drilling, Blasting, Loading and unloading, Transportation of the excavated mineral.</i>	Usage of Equipments (Excavator, Tipper, Jack Hammer), Machinery and trucks used for transportation will generate noise. Noise from the machinery can cause hypertension, high stress level, hearing loss, sleep disturbance etc due to prolonged exposure. Number of vehicles will be increased due to the proposed mining activity hence vehicle may collate which may result in unwanted sound and can also cause impact on human health like breathing and respiratory system, damage to lung tissue, influenza or asthma.	• The machinery will be maintained in good running condition so that noise will be reduced to minimum possible level. • Awareness will be imparted to the workers once in six months about the permissible noise level and effect of maximum exposure to those levels. Adequate silencers will be provided in all the diesel engines of vehicles. • It will be ensured that all transportation vehicles carry a valid PUC Certificates. • Speed of trucks entering or leaving the mine will be limited to moderate speed (20km/hr) to prevent undue noise from empty vehicles. The noise generated by the machinery will be reduced by proper lubrication of the machinery and other equipments. • It is proposed to plant 1500 Nos. of local species (Neem, Mandharai, Athi, Tamarind,

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		Ashoka, Casuarinas and Villam) to reduce the impact of noise in the study area. The development of green belts around the periphery of the mine will be implemented to attenuate noise. • The trucks will be diverted on two roads viz. ODR to avoid traffic congestion. • Health check-up camps will be organized once in six months. • Use of personal protective devices i.e., earmuffs and earplugs by workers, who are working in high noise generating areas. • Provision of quiet areas, where employees can get relief from workplace noise.
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4.6 BIOLOGICAL ENVIRONMENT:

Aspect	Impacts	Mitigation Measures
Site Clearance	Loss of habitat due to site clearance which may lead to ecological disturbance.	The proposed mining lease is already a dry land hence no site clearance is required. Only few shrubs and herbs like parthenium sp., prosopis juliflora were present.

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Planting of trees	Development of afforestation in the mine lease area will have a positive impact as the land was initially a barren.	safety distance will be provided all along the boundary of the mine lease area and safety. Around 0.82.30 Ha of land is utilized for greenbelt development (1500 Nos – 5 years). This will attract avifauna thus enhancing the existing ecological environment.
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4.7 SOCIO ECONOMIC ENVIRONMENT:

Aspect	Impact	Mitigation Measures
Proposed implementation of Mining activity	Land acquisition for the implementation of the project may result in loss of assets, which in return will make the PAP to shift, losing their normal routine and livelihood	The proposed project is a patta land of Thiru. N.H.M.Pandian and the land is vacant where there are no human settlement within 300m radius. Hence the project does not involve Rehabilitation and resettlement
Drilling, Blasting, Loading and Transportation of the mined out mineral	The mining activities may cause dust emission, noise pollution thereby causing disturbance to the local habitat	No human activity is envisaged near the project site. The nearest human settlement is observed in Anaikulam village which is 2.43 km, W from site
Grazing and Rearing activities in the nearby villages	The Grazing and rearing of local animals like Sheep, Goat and cows is observed in the nearby villages, which may be affected due to the project as	It is proposed to use gravelled road and nearest paved road and preferred not to use unpaved roads. In addition to that, the speed of trucks will be limited to 20km/hr to avoid any accidents.

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	the movement of the vehicles may affect/injure the animals	
Employment opportunity	The project will improve the livelihood of the local people	After the development of the proposed mine, it will improve the livelihood of local people and also provide the direct and indirect employment opportunities. The rough stone for the infrastructural development in the area will be made available from the local markets at reasonably lower price.
Corporate Environmental Responsibility	The proposed project will help in natural resource augmentation & Community resource development.	As a part of CER i.e, 5 Lakhs will be allocated to Panchayat Union Primary School, Anaikulam, Kadayanallur Union – 627 859, Provision of LCD Smart Board and Amenities such as Environmental awareness books (Tamil) in Library for students, Green Belt development, Drinking water facility, Hygienic Toilet and maintenance of toilet upto lease period.

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4.8 OTHER IMPACTS:

S. No	Aspect	Impact	Mitigation measure
1.	Risk due to the proposed mining	Accidents may occur in the mine area	Proper PPE kit (Safety jacket, Helmet, Safety Shoes, Gloves) etc will be provided to each and every employee in the mine lease concerning the safety of each labour
2.	Blasting	Injury to the labours due to the blasting activity	Alarm system in the form of Siren will be engaged in the project site to caution the blasting activity. In addition to that, the blasting activity will be scheduled at particular time – 12.00-2.00 PM / 4.30-5.30 PM. so that the employees will be aware of the activity. Smoking will be banned in the site and sign boards will be displayed in various places at site.
3.	Screening of Labors	Labors will be checked for health condition before employing them in mining activity	All the labours will be checked and screened for health before employing them. After employing them, periodical medical checkups will be held once in every six months.

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5 Analysis Of Alternatives

5.1 GENERAL

Analysis of alternatives is a significant aspect in planning and designing any project. Cost benefit analysis should be worked out along with other parameters while choosing an alternative in such a way that the production is maximum, and the mining operation is environmentally friendly and cost effective. The mine plan and mine closure plan were approved by the Joint Director/Assistant Director (i/c), Tenkasi vide letter Rc.No.M1/14953/2019 Dated 21.06.2023.

ToR issued by the SEIAA-TN vide Letter No. SEIAA-TN/ F. No. 10299/SEAC/ 1(a) ToR-1644/2024 Dated 09.01.2024. The study for alternative analysis involves in-depth examination of site and technology.

5.1.1 *Analysis for Alternative Sites and Mining Technology*

5.1.1.1 Alternative Site

The proposed project is the mining of Rough Stone and Gravel Quarry and is proposed after prospecting the area. In other words, these can be implemented in the mineral available zone. Since the mining block has been allotted in principal by the State Government, there is no case for studying and exploring any other site as an alternative.

5.1.1.2 Alternative Technology

The open cast mining could be manual/mechanized depending upon the geological and topographical setup of the mineral (ROM) to be won and the daily/annual targeted production.

Table 5-1: Alternative for Technology and other Parameters

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S. No.	Particular	Alternative Option 1	Alternative Option 2	Remarks
1.	Technology	Opencast semi mechanized mining	Opencast mechanized mining	Opencast semi mechanized Involving drilling and blasting are preferred. Benefits: Material is hard so to make it loose and to bring it to appropriate size.
2.	Employment	Local employment.	Outsource employment	Local employment is preferred Benefits: Provides employment to local people along with financial benefits. No residential building/ housing is required.
3.	Labour transportation	Public transport	Private transport	Local labours will be deployed from Anaikulam village so they will either reach mine site by bicycle or by foot. Benefits: Cost of transportation of labors will be negligible
4.	Material transportation	Public transport	Private transport	Material will be transported through trucks/trolleys on the contract basis. Benefits: It will give indirect employment.
5.	Water	Tanker supplier	Ground water/	Tanker supply will be preferred. Water will be sourced from Anaikulam village which is 2.43 km, W from site.

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6 Environmental Monitoring Program

6.1 GENERAL:

This chapter covers the planned environmental monitoring program. It also includes the technical aspects of monitoring the effectiveness of mitigation measures.

Monitoring is important to measure the efficiency of control measures. Post project monitoring of environmental parameters is of key importance to assess the status of environment. The monitoring program will serve as an indicator for identifying environmental degradation due to operation of the project and help in selection of appropriate mitigation measures to safeguard the environment.

Regular monitoring is as important as control of pollution since the efficacy of control measures can only be determined by monitoring. The project proponent has awarded **M/s. Ecotech Labs Pvt Ltd** for carrying out the post project environmental monitoring (PPM) and timely compliance report submission to various regulatory authorities.

Therefore, a regular monitoring programme of the environmental parameters is essential to take into account the changes in the environmental quality. The objectives of monitoring are to: -

- Verify effectiveness of planning decisions.
- Measure effectiveness of operational procedures.
- Confirm statutory and corporate compliance; and
- Identify unexpected changes.

Table 6-1: Environmental Monitoring Programme

Parameters	Sampling	Frequency	Location
Air environment – Pollutants PM 10 PM 2.5	7 locations	24 hourly twice a week 4 hourly.	➤ Project site ➤ Sri Pillaiyar Kovil, Melakaangal, ➤ KS Bricks Factory, .Meenachipuram, Surandai,

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SO ₂ NO _x		Twice a week, One non monsoon season 8 hourly, twice a week 24 hourly, twice a week	➤ P.J.Sweet, Kadayanallur Road, Sendamaram, ➤ Milagudaiyar Sastha Kovil, Uthumalai ➤ Karuppasamy.pechi amman kovil, Sendamaram ➤ Trumalaiandi garden LPM, Vadiyur
Noise	7 locations	24 hourly Once in 7 locations	➤ Project site ➤ Sri Pillaiyar Kovil, Melakaangal, ➤ KS Bricks Factory, .Meenachipuram, Surandai, ➤ P.J.Sweet, Kadayanallur Road, Sendamaram, ➤ Milagudaiyar Sastha Kovil, Uthumalai ➤ Karuppasamy.pechi amman kovil, Sendamaram ➤ Trumalaiandi garden LPM, Vadiyur
Water (Ground water) • pH • Temperature • Turbidity • Magnesium Hardness • Total Alkalinity • Chloride • Sulphate • Fluoride • Nitrate	7 locations	Once in 7 locations	➤ Project site ➤ Sri Pillaiyar Kovil, Melakaangal, ➤ KS Bricks Factory, .Meenachipuram, Surandai, ➤ P.J.Sweet, Kadayanallur Road, Sendamaram, ➤ Milagudaiyar Sastha Kovil, Uthumalai ➤ Karuppasamy.pechi amman kovil, Sendamaram, ➤ Trumalaiandi garden LPM, Vadiyur

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• Sodium • Potassium • Salinity • Total nitrogen • Total Coliforms • Fecal Coliforms			
Water (surface water) • pH • Temperature • Turbidity • Magnesium Hardness • Total Alkalinity • Chloride • Sulphate • Fluoride • Nitrate • Sodium • Potassium • Salinity • Total nitrogen • Total Coliforms • Fecal Coliforms	Sample from nearby lakes/river	One time Sampling	Kurichanpatti Kulam and Sundarapandiapuram Tank
Soil (Organic matter, Texture, pH, Electrical Conductivity, Permeability,	7 locations	Once in 7 locations	➤ Project site ➤ Sri Pillaiyar Kovil, Melakaangal, ➤ KS Bricks Factory, .Meenachipuram, Surandai, ➤ P.J.Sweet, Kadayanallur Road, Sendamaram,

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Water holding capacity, Porosity)			➤ Milagudaiyar Sastha Kovil, Uthumalai ➤ Karuppasamy.pechi amman kovil, Sendamaram, ➤ Trumalaiandi garden LPM, Vadiyur
Ecology and biodiversity Study	Study area covering 10 km radius	One time Sampling	
Socio- Economic study (Population, Literacy Level, employment, Infrastructure like school, hospitals & commercial establishments)	Villages around 10 km radius	One time Sampling	

Table 6-2: Monitoring Schedule during Mining

S. No.	Attributes	Parameters	Frequency	Location
1.	Ambient Air Quality at Mine Site & Fugitive Dust Sampling	PM 10 PM 2.5 SO ₂ NO _x	Once in a Month	Project Site
2.	Ground water Quality	Drinking Water Parameters, As per IS - 10500: 2012	Half yearly	Project Site
3.	Surface Water Quality	Class will be assessed as per the CPCB Guidelines	Half yearly	Project Site

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4.	Soil Quality	(Organic matter, Texture, pH, Electrical Conductivity, Permeability, Water holding capacity, Porosity)	Half yearly	Project Site
5.	Noise Level Monitoring	Noise level in dB(A) Quaterly/half yearly	Half yearly	Project Site

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7 Additional Studies

7.1 GENERAL

This chapter covers the details of the additional studies viz. Risk assessment, Disaster Management, Public Hearing, Rehabilitation and Resettlement.

7.1.1 *Public Hearing:*

As the proposed mining project falls under 1(a), Category B1 – Cluster Mining (includes **Abandoned Quarries** - Nil

Expired Quarries – Nil

Existing Quarries – Thiru.M.Abdul Ali – 4.00.0 Ha

Thiru.D.Sankaranarayanan – 0.98.50 Ha

Proposed Quarries – Thiru. N.H.M. Pandian – 3.01.0 Ha

Hence under 7(III) of EIA notification 2006 and its subsequent amendments, the project involves the Public Consultation and the same will be conducted under SPCB (TN) in Tirunelveli District. The proceedings of the same will be incorporated in the Final EIA Report.

7.1.2 *Risk assessment:*

For mining projects to be successful, it should meet not only the production requirements, but also maintain the highest safety standards for all the workers. The industry has to identify the hazards, assess the associated risks and bring the risks to tolerable level regularly. Mining has considerable safety risk to miners. Unsafe conditions and practices in mines lead to a number of accidents and causes loss and injury to human lives, damages the property, interrupt production etc. Risk assessment is a systematic method of identifying and analyzing the hazards associated with an activity and establishing a level of risk. The hazards cannot be completely eliminated, and thus there is a need to define and estimate an accident risk level possible to be presented either in quantitative or qualitative way.

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7.1.3 Identification of Hazard

7.1.3.1 Blasting Pattern:

The quarrying operation will be carried out in conjunction with conventional method of mining using Jack hammer drilling and blasting for shattering effect and loosen the Rough stone.

7.1.3.2 Drilling and Blasting:

Drilling and Blasting parameters are as follows:

1	Diameter of the hole	32-36 mm
2	Spacing	0.5m
3	Depth of each hole	1.2 to 1.5 m
4	Burden per hole	0.5m
5	Inclination of hole	80° from the horizontal.
6	Use of delay detonators	25 millisecond delays
7	Detonating fuse	NONEL "Detonating" Cord
8	Blasting Design	Zig Zag - Staggered in 2 to 3 rows

a. Types of explosives to be used:

Slurry Class 3 explosives, type of nitro compound are proposed to be used for shattering and heaving effect for removal and winning of Rough Stone. No deep hole drilling or Primary blasting is proposed. Detonators of Class 3 and Safety fuse of Class 6 are used.

b. Measures proposed to minimize ground vibration due to Blasting:

The quarry is situated more than 1.0 km from the nearby villages. Controlled blasting measures will be adopted for minimizing ground vibration and fly of rock. Shallow depths jackhammer drilling & blasting is proposed to be carried out with minimum use of explosive mainly to give the shattering effect in rough stone for easy excavation and to control fly of rocks.

Diameter of Holes = 32-36mm

Depth = 1.2 to 1.5 m

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Storage and safety measures to be taken while blasting: The proponent will engage an authorized explosive agency to carry out the small amount of blasting and it will be supervised by competent and statutory Foreman/Permit Mines Manager.

Heavy Machineries: The following heavy machineries will be used in the proposed area:

- For Mining – Excavator of 0.90 Cum Bucket capacity (2 No's), Jack Hammers (30-32 mm Dia) of 5 Nos.
- Loading Equipment – Excavator of 0.9 Cum Bucket Capacity
- Transportation (includes within the mine and mine to destination) – Tipper 4 Nos of 10 M.T capacity (from quarry to needy peoples and local crushers)

a. Risk:

Most of the accidents during transport of mined out mineral using other heavy vehicles are often attributed to mechanical failures and human errors.

b. Mitigation measures to minimize the risk.

- At the time of loading no person will be allowed within the swing radius of the excavation.
- The dumpers/ trucks will stand near the loading equipment and fully braked when the muck is filled in it.
- The truck would be brought to a lower level so that the loading operation suits to the ergonomic condition of the workers.
- The workers will be provided with helmets, gloves and safety boots; loading and unloading operations will be carried out only during daylight.
- All the mining machinery will be regularly maintained and checked such as brakes, lights and horns to keep in the efficient working order.

7.1.4 General Precautionary measures for the Risk involved in the proposed mine:

- In order to take care of above hazard/disaster, the following control measures will be adopted:
- All safety precautions and provisions of Mine Act, 1952, Metalliferous Mines Regulation, 1961 and Mines Rules, 1955 will be strictly followed during all mining operations;

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- Entry of unauthorized persons will be prohibited;
- Firefighting and first-aid provisions in the ECC and mining area.
- Provision of all the safety appliances such as safety boot, helmets, goggles etc. will be made available to the workers (18 Nos.) and regular inspection for their use.
- In case of eventuality, first aid will be given by the senior safety officer in the mine area initially to the injured person. The safety officer will give notice of accident as per Rule-23 of Mines Act-1952;
- The safety officer (common for 3 mines within 500m radius) will be responsible for coordination between management district authorities/DGMS etc. Regarding general safety as per Rule-181 of MMR 1961, “No person shall negligently or will fully do anything likely to endanger life or limb in the mine, or negligible or will fully omit to do anything necessary for the safety of the mine or of the persons employed there in”. The workers will be provided with protective foot wear and safety helmets;
- Cleaning of mine faces will be regularly done;
- Handling of explosives, charging and blasting will be carried out by highly skilled labors only;
- Regular maintenance and testing of all mining equipment as per manufacturer’s guidelines;
- Suppression of dust by sprinkling water on the haulage roads;

7.1.5 Safety Team:

The effective implementation of compliance of Safety Rules/ Statutory Provisions will be ensured. The safety officer will be engaged, meeting the requirement of Mines Act and their duties and responsibilities. The safety officer will be responsible for identification of the hazardous conditions and unsafe acts of workers and advice on corrective actions, conduct safety audit, organize training programs and provide professional expert advice on various issues related to occupational safety and health. Organizing safety training will be conducted to employees and contractor labors periodically.

7.1.6 Emergency Control Centre

The emergency control center will be provided to handle the emergency. The site main controller, key personnel and the senior officers of the fire and police services will attend it.

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The center will be equipped to receive and transmit information and directions from and to the incident controller and other areas of the works, as well as outside. The emergency control center will be sited in an area of minimum risk. This common Emergency control centre will be used for the mines around the 500m radius.

7.2 DISASTER MANAGEMENT

The possible risks in the case of stone along with associated minor minerals mining projects are fly rock, vibration failure of pit, slope and waste dump, accidents due to transportation. Mining and allied activities are associated with several potential hazards to both the employees and the public at large. Safety of the mine and the employees is taken care of by the mining rules & regulations, which are well defined with laid down procedure for safety, which when scrupulously followed, safety is ensured not only to manpower but also to machines & working environment.

7.2.1 *Emergency Management Plan For Proposed Mines On Site- Offsite Emergency Preparedness Plan:*

The emergency plan delineates the procedures for dealing with accidents or unexpected events and natural calamities arising from mining activity. An experience of any accidents that have occurred in other manufacturing/mining projects is considered to prepare this plan. This Emergency plan should be periodically reviewed and modified. It should also be changed based on the observations of emergency mock drills and experience of handling actual emergencies.

Major objectives of this onsite – offsite emergency plan are:

- To take necessary proactive and preventive actions to avoid the emergency.

The main aim of any emergency plan should be to prevent emergency situations.

To train the manpower to handle the emergencies of the following nature:

- Onsite (Within ML boundary)
- Offsite (Outside ML boundary)

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7.2.1 Onsite off-site emergency Plan:

1- Emergency on account of:

- Fire
- Explosion
- Major accidents involving man-made collapse of the mining edges.
- Snake bites, attack by honey bees or attack by wild animals.

2- Disaster due to natural calamities like:

- Flood/ heavy rains which can involve natural landslides.
- Earth quake
- Cyclone
- Lightening

7.2.2 Emergency Plan:

- The mining operations should be immediately stopped in case of any emergency. A siren will be sounded during emergency time.
- An emergency assembly point will be created and all the workers will guide visitors or contractors to approach assembly point.
- Emergency vehicle (Ambulance) will be available in the nearby place, in proximity to the three mines and will rush to the emergency control centre at the blowing of emergency siren. The driver of emergency vehicle will follow the instructions of Incident Controller/Site Main Controller.
- Workers will be trained for the precautions to be taken during natural disasters like heavy rain, floods, earthquake and cyclone.
- All escape routes from mines to the assembly point or any other safe location will be made and the escape plan will be displayed in many places in the mine area

7.2.3 Emergency Control:

- Shut down of mining operations: Raising the alarm or siren followed by immediate safe shut down of the power supply, and isolation of affected areas.
- Treatment of injured: First aid and hospitalization of injured persons

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- Protection of environment and property: During mitigation, efforts will be made to prevent impacts on environment and property to the extent possible.
- Preserving all evidences and records: This will be done to enable a thorough investigation of the true causes of the emergency.
- Ensuring safety of personnel prior to restarting of operations: Efforts required will be made to ensure that work environment is safe prior to restarting the work.

7.3 NATURAL RESOURCE CONSERVATION

There are no natural resources within the premises. The conservation strategies for energy will be followed in the proposed mine lease area. The pollutants of the mine will be minimized by adopting appropriate mitigation measures as mentioned Chapter 5 to prevent the effects on nearest water bodies. No surface runoff from the project site will be let into the nearest water bodies.

7.4 RESETTLEMENT AND REHABILITATION:

The proposed Mine lease area is patta land. There is no displacement of the population within the project area and adjacent nearby area and hence Rehabilitation & Resettlement is not applicable.

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8 Project Benefits

8.1 GENERAL

This chapter covers the benefits accruing to the locality, neighborhood, region and nation as a whole. It brings out the details of benefits by way of improvements in the physical infrastructure, social infrastructure, employment potential and other tangible benefits.

8.1.1 *Physical Benefits*

The opening of the proposed project will enhance the following physical infrastructure facilities in the adjoining areas:

Market: Generating useful economical resource for construction. Due to demand supply chain, excavated mineral (Rough stone) will be sold in the market in the affordable price.

Infrastructure: The excavated rough stone will be used for *Laying Roads, Building & Construction Projects, Bridges.*

Enhancement of Green Cover & Green Belt Development: As a part of reclamation plan, native tree species will be planted along the safety boundary of the mine lease area. A suitable combination of trees that can grow fast and also have good leaf cover will be adopted to develop the green belt. It is proposed to plant 1500 numbers of native species along with some fruit bearing and medicinal trees during the mining plan period.

8.2 SOCIAL BENEFITS

The mining in the area will create rural employment. During site visit, it has been observed that the economic conditions of the villages in the study area is quite normal. After the development of the proposed mine, it will improve the livelihood of local people and also provide indirect employment opportunities. The rough stone for the infrastructural development in the area will be made available from the local markets at reasonably lower price.

As a part of CER, i.e., 5 Lakhs will be allocated. The detailed agenda, which is to be executed has been framed. The salient features of the programs are as follows:

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LCD Smart Board and Amenities such as Environmental awareness books (Tamil) in Library for students, Green Belt development, Drinking water facility, Hygienic Toilet and maintenance of toilet upto lease period.

8.3 PROJECT COST / INVESTMENT DETAILS

(a) Investment Cost:

S. No	DETAILS	COST in Rs. /-
i)	Lease rent / Land Cost	6,50,000
ii)	Machinery to be used	Hired machinery
iii)	Fencing	2,50,000
iv)	Labourers Shed	50,000
v)	Sanitary facility	30,000
vi)	Other Items	20,000
TOTAL		10,00,000

(b). Expenditure/ Production Cost. (1Unit= 2.83m³)

Drilling and Blasting cost / unit = Rs.100/- (including loading & breaking).

i). Mining cost for rough stone up to 5 Years planned production quantity.

$$\begin{aligned}
 \text{Total Minalable quantity in M}^3 &= 3,03,165 \text{ M}^3 (1,07,125 \text{ Units}) \\
 \text{Total cost of mining Rough Stone} &= 1,07,125 \times \text{Rs. } 100/- \\
 &= \text{Rs. } 1,07,12,500/-
 \end{aligned}$$

ii). Mining cost for gravel & weathered rock for 5 Years planned production quantity.

$$\begin{aligned}
 \text{Total Minalable quantity in M}^3 &= 65,397 \text{ M}^3 (23,108 \text{ Units}) \\
 \text{Total cost of mining - Gravel} &= 23,108 \times \text{Rs. } 50/- \\
 &= \text{Rs. } 11,55,400/-
 \end{aligned}$$

$$\text{Total Cost for Mining} = \text{Rs. } 1,18,67,900/-$$

$$\text{Say} = \text{Rs. } 1,18,68,000/-$$

$$\text{Total Project Cost (a+b)} = \text{Rs. } 1,28,68,000/-.$$

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EMP Cost:

Categories	Mitigation Measure	Provision for Implementation	Capital Cost	Recurring Cost
			(Rs)	
Air Environment	Compaction, gradation and drainage on both sides for Haulage Road	Rental Dozer & drainage construction on haul road @ Rs. 10,000/- per hectare; and yearly maintenance @ Rs. 10,000/- per hectare	30100	30100
	Fixed Water Sprinkling Arrangements + Water sprinkling by own water tankers	Fixed Sprinkler Installation and New Water Tanker Cost for Capital; and Water Sprinkling (thrice a day) Cost for recurring	300000	25000
	Air Quality will be regularly monitored as per norms within ML area & Ambient Area	Yearly Compliance as per CPCB norms	0	40000
	Muffle blasting – To control fly rocks during blasting	Blasting face will be covered with sand bags / steel mesh / old tyres / used conveyor belts	0	0
	Wet drilling procedure / latest eco-friendly drill machine with separate dust extractor unit	Dust extractor @ Rs. 25,000/- per unit deployed as capital & @ Rs. 2500 per unit recurring cost for maintenance	25000	2500
	No overloading of trucks/tippers/tractors	Manual Monitoring through Security guard	0	5000
	Stone carrying trucks will be covered by tarpaulin	Monitoring if trucks will be covered by tarpaulin	0	10000

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	Enforcing speed limits of 20 km/hr within ML area	Installation of Speed Governors @ Rs. 5000/- per Tipper/Dumper deployed	5000	0
	Regular monitoring of exhaust fumes as per RTO norms		0	5000
	Regular sweeping and maintenance of approach roads for at least about 200 m from ML Area	Provision for 2 labours @ Rs.10,000/labour (Contractual) per Hectare	0	60200
	Installing wheel wash system near gate of quarry	Installation + Maintenance + Supervision	30000	10000
Noise Environment	Source of noise will be during operation of transportation vehicles, HEMM for this proper maintenance will be done at regular intervals.	Provision made in Operating Cost	0	0
	Oiling & greasing of Transport vehicles and HEMM at regular interval will be done	Provision made in Operating Cost	0	0
	Adequate silencers will be provided in all the diesel engines of vehicles.	Provision made in Operating Cost	0	0
Noise Environment	It will be ensured that all transportation vehicles carry a fitness certificate.	Provision made in Operating Cost	0	0
	Safety tools and implements that are required will be kept adequately near blasting	Provision made in OHS part	0	0

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	site at the time of charging.			
	Ambient Noise will be regularly monitored as per norms within ML area and near Reserve Forest with necessary permission	Yearly compliance as per CPCB Norms	0	0
	Line Drilling all along the boundary to reduce the PPV from blasting activity and implementing controlled blasting.	Provision made in Operating Cost	0	0
	Proper warning system before blasting will be adopted and clearance of the area before blasting will be ensured.	Blowing Whistle by Mining Mate / Blaster / Competent Person	0	0
	Provision for Portable blaster shed	Installation of Portable blasting shelter	30000	2000
	NONEL Blasting will be practiced to control Ground vibration and fly rocks	Rs. 30/- per 6 Tonnes of Blasted Material	0	100000
Water Environment	Water Environment	Provision for garland drain @ Rs. 10,000/- per Hectare with maintenance of Rs. 5,000/- per annum	22300	5000
Waste Management	Waste management (Spent Oil, Grease etc.,)	Provision for domestic waste collection and disposal through authorized agency	3000	2000

Project	Rough stone and Gravel Quarry – 3.01.00 Ha	Draft EIA Report
Project Proponent	Thiru.N.H.M.Pandian	
Project Location	Anaikulam Village, Veerakeralampudur Taluk, Tenkasi District	

		Installation of dust bins	5000	2000
	Bio toilets will be made available outside mine lease on the land of owner itself	Provision made in Operating Cost	0	0
Implementation of EC, Mining Plan & DGMS Condition	Size 6' X 5' with blue background and white letters as mentioned in MoM Appendix II by the SEAC TN	Fixed Display Board at the Quarry Entrance as permanent structure mentioning Environmental Conditions	7000	1000
	Workers will be provided with Personal Protective Equipment's	Provision of PPE @ Rs. 4000/- per employee with recurring based on wear and tear (say, @ Rs. 1000/- per employee)	44000	11000
Implementation of EC, Mining Plan & DGMS Condition	Health checkup for workers will be provisioned	IME & PME Health checkup @ Rs. 1000/- per employee	0	11000
	First aid facility will be provided	Provision of 2 Kits per Hectare @ Rs. 2000/-	0	6020
	Mine will have safety precaution measures, signages, boards.	Provision for signages and boards made	10000	2000
	Barbed Wire Fencing to quarry area will be provisioned.	Per Hectare fencing Cost @ Rs. 2,00,000/- with Maintenance of Rs 10,000/- per annum	602000	10000

Project	Rough stone and Gravel Quarry – 3.01.00 Ha	Draft EIA Report
Project Proponent	Thiru.N.H.M.Pandian	
Project Location	Anaikulam Village, Veerakeralampudur Taluk, Tenkasi District	

Implementation of EC, Mining Plan & DGMS Condition	No parking will be provided on the transport routes. Separate provision on the south side of the hill will be made for vehicles /HEMMs. Flaggers will be deployed for traffic management	Parking area with shelter and flags @ Rs. 50,000/- per hectare project and Rs. 10,000/- as maintenance cost	150500	10000
	Installation of CCTV cameras in the mines and mine entrance	Camera 4 Nos, DVR, Monitor with internet facility	20000	5000
	Implementation as per Mining Plan and ensure safe quarry working	Mines Manager (1st Class / 2nd Class / Mine Foreman) under regulation 34 / 34 (6) of MMR, 1961 and Mining Mate under regulation 116 of MMR,1961 @ 40,000/- for Manager & @ 25,000/- for Foreman / Mate	0	540000
Greenbelt development	Green belt development - 500 trees per one hectare (200 Inside Lease Area & 300 Outside Lease Area)	Site clearance, preparation of land, digging of pits / trenches, soil amendments, transplantation of saplings @ 200 per plant (capital) for plantation inside the lease area and @ 30 per plant maintenance (recurring)	120400	18060
		Avenue Plantation @ 300 per plant (capital) for plantation outside the lease area and @ 30 per plant maintenance (recurring)	270900	27090

<i>Project</i>	<i>Rough stone and Gravel Quarry – 3.01.00 Ha</i>	<i>Draft EIA Report</i>
<i>Project Proponent</i>	<i>Thiru.N.H.M.Pandian</i>	
<i>Project Location</i>	<i>Anaikulam Village, Veerakeralampudur Taluk, Tenkasi District</i>	

Conducting Slope stability survey cost (The depth of the project beyond 30m)	300000	0
Total	1963000	942970
Total Cost	2905970	

EMP Cost break up for the period of five years is given below.

Year	Cost (@ 5% per year inflation adjustment)
1 st Year	2905970/-
2 nd Year	990119/-
3 rd Year	1039624/-
4 th Year	1091606/-
5 th Year	1146186/-
Total	71,73,504/-

Total Environmental Management Plan Cost – **Rs. 71,73,504/-** (Seventy-one lakh seventy-three thousand five hundred and four rupees only).

<i>Project</i>	<i>Rough stone and Gravel Quarry – 3.01.00 Ha</i>	<i>Draft EIA Report</i>
<i>Project Proponent</i>	<i>Thiru.N.H.M.Pandian</i>	
<i>Project Location</i>	<i>Anaikulam Village, Veerakeralampudur Taluk, Tenkasi District</i>	

9 Environmental Management Plan

9.1 INTRODUCTION

This chapter comprehensively presents the Environmental Management Plan (EMP), which includes the administrative and technical setup, summary matrix of EMP, the cost involved to implement the EMP, during various Mining activities and provisions made towards the same in the cost estimates of project. This chapter describes the proposed monitoring scheme as well as inter-organizational arrangements for effective implementation of the mitigation measures.

9.2 SUBSIDENCE

Mining will be carried out by opencast mechanized mining method with drilling & blasting as per the mining plan approved by Department of Mining and Geology, Tenkasi. Subsidence/slope failures are not envisaged because there are no loose strata overlying the deposit (mineral to be excavated). The bench height will be 5m. The individual bench slope has been proposed to be kept at 60° from horizontal. Moreover, all safety standards/ safeguards will be implemented as per guidelines prescribed by Director General of Mines Safety.

9.3 MINE DRAINAGE

9.3.1 Storm water Management

The following measures will be taken with respect to the prevailing site conditions.

- Storm water drains with silt traps of size 1m x 1m will be suitably constructed all along the periphery of the pit area to collect the run-off from the mine area and divert into the pit.
- All measures will be taken not to disturb the existing drainage pattern adjacent to the mine lease area.
- The storm water collected from the mine area will be utilized for dust suppression on haul roads, plantation within the premises, etc.,

<i>Project</i>	<i>Rough stone and Gravel Quarry – 3.01.00 Ha</i>	<i>Draft EIA Report</i>
<i>Project Proponent</i>	<i>Thiru.N.H.M.Pandian</i>	
<i>Project Location</i>	<i>Anaikulam Village, Veerakeralampudur Taluk, Tenkasi District</i>	

9.3.2 Drainage

Local workers will be deployed for the project. But urinals and Latrines will be provided and the same will be connected to septic tank followed by soak pit arrangement. No domestic waste will be deposited into the nearby area. Regular checking will be carried out to find any blockage due to silting or accumulation of loose materials. The drains will also be checked for any damage in lining / stone pitching, etc.

9.3.3 Administrative and Technical Setup

The Environment Management Plan (EMP) will consist of all mitigation measures for each component of the environment due to the activities increased during mining operation to minimize adverse environmental impacts resulting from the activities of the project.

To carry out the above activities, Thiru.N.H.M.Pandian will work in association with M/s. Ecotech Labs Pvt Ltd.

Project	Rough stone and Gravel Quarry – 3.01.00 Ha	Draft EIA Report
Project Proponent	Thiru.N.H.M.Pandian	
Project Location	Anaikulam Village, Veerakeralampudur Taluk, Tenkasi District	

Table 9-1: Impacts and mitigation measures

S. No	Impacts on Environment	Activity / Aspect	Anticipated impacts	Mitigation measures
1.	Air	Fugitive Emission	During mining operation, fugitive dust and other air pollutants like particulate matter (PM10 & PM 2.5) will be generated.	Planting of trees along the safety distance of the Mine Lease Area Water will be sprinkled in the site as dust suppression measure.
2.	Water	Wastewater Generation	Improper management of Domestic wastewater in the Mine lease may create unhygienic conditions in the site thereby causing health impacts to the labors	Provision of urinals/Latrines along with septic tank followed by soak pit arrangement will be provided in the Mine Lease area for the proper management of wastewater.
3.	Noise	Mining activities like drilling, blasting, loading and transportation	Noise from the machinery can cause hypertension, high stress level, hearing loss, sleep disturbance etc due to prolonged exposure. Apart from Mining activities like drilling, blasting may generate noise	Use of personal protective devices i.e., earmuffs and earplugs by workers, who are working in high noise generating areas.

Project	<i>Rough stone and Gravel Quarry – 3.01.00 Ha</i>	<i>Draft EIA Report</i>
Project Proponent	<i>Thiru.N.H.M.Pandian</i>	
Project Location	<i>Anaikulam Village, Veerakeralampudur Taluk, Tenkasi District</i>	

4.	Land	Improper management of Storm water Runoff	Storm water Runoff may result in Soil Erosion	Garland drainage of 1m x 1m will be provided to avoid storm water run-off.
5.	Social Responsibility	Mining workers	Unhygienic site sanitation facilities may cause health damage to workers.	The objective is to ensure health and safety of the workers with effective provisions for the basic facilities of sanitation, drinking water, safety of equipments or machinery etc. The following will be done in the site ✓ By complying with the safety procedures, norms and guidelines (as applicable) as outlined in the National Building Code of India, Bureau of Indian Standards. ✓ Provide adequate number of decentralized latrines and urinals ✓ Providing Septic tank along with Soak pit arrangement

Project	Rough stone and Gravel Quarry – 3.01.00 Ha	Draft EIA Report
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				✓ Providing First Aid room, conducting frequent health checkups to labor and conducting free medical camps ✓ Providing safety helmet, Gloves, Jacket & Boots ✓ Providing measures to prevent fires. Fire fighting extinguishers and buckets of sand will be provided in the construction site
6.	Building materials resource conservation	Building Material consumption	Use of farfetched construction materials than the locally available construction materials may lead to over exploitation of natural resources & increase in carbon footprint.	• Use of locally available construction materials.

Project	<i>Rough stone and Gravel Quarry – 3.01.00 Ha</i>	<i>Draft EIA Report</i>
Project Proponent	<i>Thiru.N.H.M.Pandian</i>	
Project Location	<i>Anaikulam Village, Veerakeralampudur Taluk, Tenkasi District</i>	

10 Summary & Conclusion

This chapter summarizes the overall justification for implementation of the project and explains how the potential impacts are mitigated.

10.1 INTRODUCTION

Thiru.N.H.M.Pandian site is a cluster of three mining projects. Total cluster area is 7.99.0 Ha. The individual mine lease area is 3.01.00 Ha of Rough Stone and Gravel Quarry located at S.F.Nos. 302/1 (1.70.50Ha.), 304/1A (0.54.00Ha.) & 304/2A (0.76.50Ha.) of Anaikulam Village, Veerakeralampudur Taluk, Tenkasi District.

10.2 PROJECT OVERVIEW

Table 10-1: Project Overview

S. No.	Description	Details
1	Project Name	Thiru.N.H.M.Pandian Rough Stone and Gravel Quarry
2	Proponent	Thiru.N.H.M.Pandian
3	Mining Lease Area Extent	3.01.00 Ha
4	Location	302/1 (1.70.50Ha.), 304/1A (0.54.00Ha.) & 304/2A (0.76.50Ha.)
5	Latitude	09°00' 05.83" to 09°00' 16.00" N
6	Longitude	77°28' 32.52" to 77°28' 37.57" E
7	Topography	Plain Topography
8	Site Elevation above MSL	194.0 m from MSL
9	Topo sheet No.	58 G/08 of Survey of India
10	Minerals of Mine	Rough Stone and Gravel Quarry

Project	<i>Rough stone and Gravel Quarry – 3.01.00 Ha</i>	<i>Draft EIA Report</i>
Project Proponent	<i>Thiru.N.H.M.Pandian</i>	
Project Location	<i>Anaikulam Village, Veerakeralampudur Taluk, Tenkasi District</i>	

11	Proposed production of Mine	303165m ³ of Rough stone & 65397m ³ of Gravel
12	Ultimate depth of Mining	49.0 m below ground level
13	Method of Mining	Open cast mechanized mining
14	Water demand	6.0 KLD
15	Source of water	Water will be supplied through tankers supply
16	Man power	11 Nos.
17	Mining Plan Approval	Mining Plan was approved by the Joint Director/Assistant Director (i/c), Tenkasi vide letter Rc.No.M1/14953/2019 Dated 21.06.2023
18	Production details	Geological reserves: 1402830 m ³ of rough stone and 103341 m ³ of Gravel Proposed year wise reserves: 303165 m ³ of rough stone and 65397 m ³ of Gravel
19	Boundary Fencing	7.5 m barrier all along the boundary for adjacent patta lands and 10 m safety distance for Govt. Lands. Fencing will be provided.
20	Disposal of overburden	The overburden is in the form of topsoil and weathered rock formation. It will be quarried for filling purposes to nearby end users and part of soil will be preserved all along the boundary as barrier for afforestation.
21	Ground water	Ground water table in this area is below 65 mts from ground level. The quarrying is up to a maximum depth of 49.0m below the ground level. Hence the quarry operation will not be affected by the ground water.

Project	<i>Rough stone and Gravel Quarry – 3.01.00 Ha</i>	<i>Draft EIA Report</i>
Project Proponent	<i>Thiru.N.H.M.Pandian</i>	
Project Location	<i>Anaikulam Village, Veerakeralampudur Taluk, Tenkasi District</i>	

22	Habitations within 300m radius of the Project Site	There is no Habitation within 300m radius of the project site.
23	Drinking water	Water will be supplied through tankers from Anaikulam village which is 2.43 Km W of the area

10.3 JUSTIFICATION OF THE PROPOSED PROJECT

The said project plays a significant role in the domestic as well as infrastructural market. To achieve a huge infrastructure being envisaged by Government of India, particularly in road and housing sector, there is a need for basic building materials. The rough stone form the primary building material.

Rough stone is one of the most valuable natural building materials. Aggregates are mostly used for building roads and footpaths Aggregates – stone used for its strong physical properties – crushed and sorted into various sizes for use in concrete, coated with bitumen to make asphalt or used 'dry' as bulk fill in construction. Mostly used in roads, concrete and building products. Aggregates represent about 98% of quarry output, most of which is used in road construction, maintenance and repair. Much of this goes to the production of asphalt; the remainder is used 'dry' without the addition of other materials to provide a sturdy base for roads.

Southern Granulite Terrain (SGT) of Tamil Nadu lying south of Palaghat-Cauvery shear zone has been divided into two major tectonic blocks by the Madurai block and Nagercoil-Trivandrum Block in the south. It is separated by WNW-ESE trending Achankovil-Tamiraparani Lineament. Tirunelveli and Thothukudi are significantly the only districts in the state to witness the geology and structure of both the blocks. Tirunelveli district represents a well-developed lithopackage of meta-sedimentary sequence inter banded with charnockite Group of rocks. The rock types exposed are of quartzite, calc-granulite, garnet-biotite-sillimanite gneiss, garnet quartzo-feldspathic gneiss and garnetbiotite-cordierite gneiss belonging to Khondalite Group of rock. Charnockite and pyroxene granulite are the Charnockite Group. Hornblende-biotite gneiss belongs to Migmatitic Complex. Besides, basic intrusive (pyroxenite)

Project	<i>Rough stone and Gravel Quarry – 3.01.00 Ha</i>	<i>Draft EIA Report</i>
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Project Location	<i>Anaikulam Village, Veerakeralampudur Taluk, Tenkasi District</i>	

and acid intrusive (granite) are noticed. The younger intrusive are represented by pegmatite and quartz veins. Evidence of development of incipient / patchy charnockite along the shear plane is noticed in the district along the Western Ghat high hills

Table 10-2: Anticipate Impacts & Appropriate Mitigation Measures

S. No.	Potential Impact	Mitigation Measure
1	The main impact in the air environment is dust emission during various mining activities such drilling, blasting, excavation, loading and transportation. The dust emission may affect the quality of ambient air in the and around the mine area. The increased emission may cause respiratory & Cardiovascular problems in human health	Proper mitigation measures like water sprinkling on haul roads will be adopted to control dust emissions. To control the emissions regular preventive maintenance of equipments will be carried out on contractual basis. Plantation will be carried out along approach roads & mine premises.
2	Waste water will be generated due to mining activity and from other domestic activities. These may contaminate the ground water leading to ground water. The mining activity may affect the ground water table	No waste water will be generated from the mining activity of minor minerals as the project only involves lifting of over burden from mine site. The wastewater generated from the domestic activity will be disposed off safely through the proposed septic tank. Mining will not intersect ground water table. Hence the water table will not be impacted due to the proposed project
3	Noise will be generated in the mine area during various mining activities such as blasting, drilling, excavation. During transportation of the mined out mineral,	Periodical monitoring of noise will be done. No other equipments except the transportation vehicles and Excavator

Project	<i>Rough stone and Gravel Quarry – 3.01.00 Ha</i>	<i>Draft EIA Report</i>
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	there may be noise generation due to the movement of vehicles. This may impact the health condition of the workers by creating headache	(as & when required) for loading will be allowed at site. Noise generated by these equipments shall be intermittent and does not cause much adverse impact. Plantation will be carried out along approach roads. The plantation minimizes propagation of noise and also arrest dust.
4	Solid waste will be generated from the mining activity as there will be refuse after 95% recovery and also generation of domestic waste	The 100% recovery is achieved by extracting the entire mineable reserve. Hence there will be no refuse generation due to the mining activity. Apart from that, a very meagre quantity of domestic waste will be generated in the project, which will be handed over to the local body on daily basis.
5	During mining activities, there are chances of workers getting health issues or may be prone to accidents	Dust masks will be provided as additional personal protection equipment to the workers working in the dust prone area. Periodical trainings will be conducted to create awareness about the occupational health hazards due to activities like blasting, drilling, excavation Workers health related problem if any, will be properly addressed.

<i>Project</i>	<i>Rough stone and Gravel Quarry – 3.01.00 Ha</i>	<i>Draft EIA Report</i>
<i>Project Proponent</i>	<i>Thiru.N.H.M.Pandian</i>	
<i>Project Location</i>	<i>Anaikulam Village, Veerakeralampudur Taluk, Tenkasi District</i>	

11 Disclosure of Consultant

11.1 INTRODUCTION

This chapter presents the details of the environmental consultants engaged, their background and the brief description of the key personnel involved in the project. Specific studies on the mining project have been carried out by engaging engineers/experts of Ecotech Labs Pvt. Ltd, Chennai. Ecotech Labs Pvt. Ltd (ETL), Chennai is NABET accredited consultancy organization. ETL is equipped with in-house, spacious laboratory, accredited by NABL (National Accreditation Board for Testing & Calibration Laboratories), Department of Science & Technology, Government of India and MoEF & CC.

11.2 ECO TECH LABS PVT. LTD – ENVIRONMENT CONSULTANT

Eco Tech Labs Pvt. Ltd is a multi-disciplinary testing and research laboratory in India. Eco Tech labs provides high quality services in environmental consultancy, engineering solution, chemical and microbiological laboratory analysis of food, water and environment (Air, Water, Soil) with highest accuracy.

The Quality policy

- We at Eco Tech Labs Pvt. Ltd. engaged in providing Environmental consulting services and we are committed to strengthen our capabilities in all areas of our operations in line with customer requirements & expectations, applicable legal requirements & stakeholders expectations.
- We are committed to establish and maintain Quality Management System (QMS) for continual improvement in processes and Services
- We are committed to provide customized solutions in realistic, time bound and cost effective to achieve highest degree of customer satisfaction and Environmental improvement.
- We shall establish, maintain & periodically review our documented management systems, objectives and performance in consultation with our employees and prevailing best practices.

<i>Project</i>	<i>Rough stone and Gravel Quarry – 3.01.00 Ha</i>	<i>Draft EIA Report</i>
<i>Project Proponent</i>	<i>Thiru.N.H.M.Pandian</i>	
<i>Project Location</i>	<i>Anaikulam Village, Veerakeralampudur Taluk, Tenkasi District</i>	

- Effective communication of organization's policy and objectives to employees and seeking feedbacks from all our employees and concerned stakeholders for continual improvement.

ANNEXURE-I

**STANDARD TOR CONDITIONS WITH
ADDITIONAL TOR POINTS**



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

**STATE LEVEL ENVIRONMENT IMPACT
ASSESSMENT AUTHORITY-TAMILNADU**

3rd Floor, Panagal Maaligai,
No.1, Jeenis Road, Saidapet,
Chennai - 600 015.
Phone No. 044-24359973
Fax No. 044-24359975

TERMS OF REFERENCE (ToR)

Lr No.SEIAA-TN/F.No.10299/SEAC/1(a)ToR-1644/2024 Dated:09.01.2024.

To

Thiru. N.H.M. Pandian,
S/o. Navaneethakrishna Pandian,
D.No. 4/7, Kurunthan Mozhi,
Kuruchampatti Post,
Veerakeralampudur Taluk,
Tenkasi District – 627 860.

Sir / Madam,

Sub: SEIAA, Tamil Nadu – Proposed Rough Stone and Gravel Quarry lease over an Extent of 3.01.00 Ha of S.F.Nos. 302/1, 304/1A & 304/2A of Anaikulam Village, Veerakeralampudur Taluk, Tenkasi District, Tamil Nadu by Thiru. N.H.M. Pandian - under project category – “B1” and Schedule S.No.1(a) “Mining of Minerals Projects” – **ToR issued along with Public Hearing-** preparation of EIA report – Regarding.

Ref: 1. Online proposal No. SIA/TN/MIN/439473/2023 dated.07.08.2023.
2. Your application submitted for Terms of Reference dated:09.08.2023.
3. Minutes of the 409th SEAC meeting held on 21.09.2023.
4. Minutes of the 430th SEAC meeting held on 14.12.2023
5. Minutes of the 687th SEIAA meeting held on 09.01.2024.

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


**MEMBER SECRETARY
SEIAA-TN**

The proponent, Thiru. N.H.M. Pandian has submitted an application for Terms of Reference (ToR) on 09.08.2023, for the Proposed Rough Stone and Gravel Quarry lease over an Extent of 3.01.00 Ha of S.F.Nos. 302/1, 304/1A & 304/2A of Anaikulam Village, Veerakeralampudur Taluk, Tenkasi District, Tamil Nadu.

Discussion by SEAC and the Remarks:-

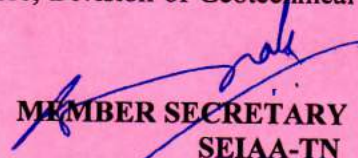
The proposal was placed in the 430th meeting of SEAC held on 14.12.2023. The details of the project furnished by the proponent are given in the website (parivesh.nic.in).

The SEAC noted the following:

1. The project proponent, Thiru. N.H.M. Pandian has applied for Terms of Reference for the Proposed Rough Stone and Gravel Quarry at over an Extent of 3.01.00 Ha of S.F.Nos. 302/1 304/1A & 304/2A of Anaikulam Village, Veerakeralampudur Taluk, Tenkasi District, Tamil Nadu.
2. The project/activity is covered under Category "B1" of Item 1(a) "Mining of Minerals Projects" of the Schedule to the EIA Notification, 2006.
3. Earlier, the proposal was placed in the 409th SEAC meeting held on 21.09.2023 during which the proponent was absent.
4. In view of the above, the proposal is again placed in this 430th SEAC meeting.
5. As per the mining plan, the lease period is for 5 years. The production for 5 years is 3,03,165m³ of rough stone & 65,397m³ of gravel upto the depth of 49 m below ground level.

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

1. The Project Proponent shall furnish the revised EMP based on the study carried out on impact of the dust & other environmental impacts due to proposed quarrying operations on the nearby agricultural lands for remaining life of the mine in the format prescribed by the SEAC considering the cluster situation.
2. The PP shall prepare a conceptual working plan accommodating the remedial actions based on the scientific studies carried out to assess the slope stability of the working benches to be constructed and existing quarry wall including the common wall/pillar exists adjacent to a quarry, by involving any one of the reputed Research and Academic Institutions - CSIR-Central Institute of Mining & Fuel Research / Dhanbad, NIRM/Bangalore, Division of Geotechnical


MEMBER SECRETARY
SEIAA-TN

Engineering-IIT-Madras, NIT-Dept of Mining Engg, Surathkal, and Anna University Chennai-CEG Campus. The PP shall submit a copy of the aforesaid report indicating the stability status of the quarry wall and slope stability action plan during the time of appraisal for obtaining the EC.

3. The PP shall undertake Hydrogeology study considering nearby existing wells, Aquifers, Ground water & surface water levels etc within the radius of 1km.

ANNEXURE I

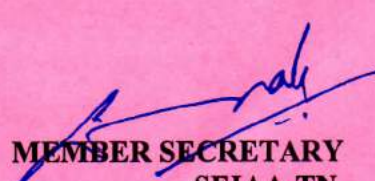
1. In the case of existing/operating mines, a letter obtained from the concerned AD (Mines) shall be submitted and it shall include the following:
 - (i) Original pit dimension
 - (ii) Quantity achieved Vs EC Approved Quantity
 - (iii) Balance Quantity as per Mineable Reserve calculated.
 - (iv) Mined out Depth as on date Vs EC Permitted depth
 - (v) Details of illegal/illicit mining
 - (vi) Violation in the quarry during the past working.
 - (vii) Quantity of material mined out outside the mine lease area
 - (viii) Condition of Safety zone/benches
 - (ix) Revised/Modified Mining Plan showing the benches of not exceeding 6 m height and ultimate depth of not exceeding 50m.
2. Details of habitations around the proposed mining area and latest VAO certificate regarding the location of habitations within 300m radius from the periphery of the site.
3. The proponent is requested to carry out a survey and enumerate on the structures located within the radius of (i) 50 m, (ii) 100 m, (iii) 200 m and (iv) 300 m (v) 500m shall be enumerated with details such as dwelling houses with number of occupants, whether it belongs to the owner (or) not, places of worship, industries, factories, sheds, etc with indicating the owner of the building, nature of construction, age of the building, number of residents, their profession and income, etc.
4. The PP shall submit a detailed hydrological report indicating the impact of proposed quarrying operations on the waterbodies like lake, water tanks, etc are located within 1 km of the proposed quarry.
5. The Proponent shall carry out Bio diversity study through reputed Institution and the same shall be included in EIA Report.


MEMBER SECRETARY
SEIAA-TN

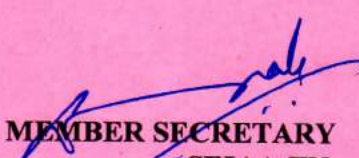
6. The DFO letter stating that the proximity distance of Reserve Forests, Protected Areas, Sanctuaries, Tiger reserve etc., up to a radius of 25 km from the proposed site.
7. In the case of proposed lease in an existing (or old) quarry where the benches are not formed (or) partially formed as per the approved Mining Plan, the Project Proponent (PP) shall the PP shall carry out the scientific studies to assess the slope stability of the working benches to be constructed and existing quarry wall, by involving any one of the reputed Research and Academic Institutions - CSIR-Central Institute of Mining & Fuel Research / Dhanbad, NIRM/Bangalore, Division of Geotechnical Engineering-IIT-Madras, NIT-Dept of Mining Engg, Surathkal, and Anna University Chennai-CEG Campus. The PP shall submit a copy of the aforesaid report indicating the stability status of the quarry wall and possible mitigation measures during the time of appraisal for obtaining the EC.
8. However, in case of the fresh/virgin quarries, the Proponent shall submit a conceptual 'Slope Stability Plan' for the proposed quarry during the appraisal while obtaining the EC, when the depth of the working is extended beyond 30 m below ground level.
9. The PP shall furnish the affidavit stating that the blasting operation in the proposed quarry is carried out by the statutory competent person as per the MMR 1961 such as blaster, mining mate, mine foreman, II/I Class mines manager appointed by the proponent.
10. The PP shall present a conceptual design for carrying out only controlled blasting operation involving line drilling and muffle blasting in the proposed quarry such that the blast-induced ground vibrations are controlled as well as no fly rock travel beyond 30 m from the blast site.
11. The EIA Coordinators shall obtain and furnish the details of quarry/quarries operated by the proponent in the past, either in the same location or elsewhere in the State with video and photographic evidences.
12. If the proponent has already carried out the mining activity in the proposed mining lease area after 15.01.2016, then the proponent shall furnish the following details from AD/DD, mines,
13. What was the period of the operation and stoppage of the earlier mines with last work permit issued by the AD/DD mines?
14. Quantity of minerals mined out.
 - Highest production achieved in any one year
 - Detail of approved depth of mining.


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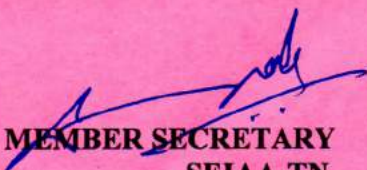
- Actual depth of the mining achieved earlier.
 - Name of the person already mined in that leases area.
 - If EC and CTO already obtained, the copy of the same shall be submitted.
 - Whether the mining was carried out as per the approved mine plan (or EC if issued) with stipulated benches.
15. All corner coordinates of the mine lease area, superimposed on a High-Resolution Imagery/Topo sheet, topographic sheet, geomorphology, lithology and geology of the mining lease area should be provided. Such an Imagery of the proposed area should clearly show the land use and other ecological features of the study area (core and buffer zone).
 16. The PP shall carry out Drone video survey covering the cluster, green belt, fencing, etc.,
 17. The proponent shall furnish photographs of adequate fencing, green belt along the periphery including replantation of existing trees & safety distance between the adjacent quarries & water bodies nearby provided as per the approved mining plan.
 18. The Project Proponent shall provide the details of mineral reserves and mineable reserves, planned production capacity, proposed working methodology with justifications, the anticipated impacts of the mining operations on the surrounding environment, and the remedial measures for the same.
 19. The Project Proponent shall provide the Organization chart indicating the appointment of various statutory officials and other competent persons to be appointed as per the provisions of the Mines Act'1952 and the MMR, 1961 for carrying out the quarrying operations scientifically and systematically in order to ensure safety and to protect the environment.
 20. The Project Proponent shall conduct the hydro-geological study considering the contour map of the water table detailing the number of groundwater pumping & open wells, and surface water bodies such as rivers, tanks, canals, ponds, etc. within 1 km (radius) along with the collected water level data for both monsoon and non-monsoon seasons from the PWD / TWAD so as to assess the impacts on the wells due to mining activity. Based on actual monitored data, it may clearly be shown whether working will intersect groundwater. Necessary data and documentation in this regard may be provided.
 21. The proponent shall furnish the baseline data for the environmental and ecological parameters with regard to surface water/ground water quality, air quality, soil quality & flora/fauna including traffic/vehicular movement study.


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22. The Proponent shall carry out the Cumulative impact study due to mining operations carried out in the quarry specifically with reference to the specific environment in terms of soil health, biodiversity, air pollution, water pollution, climate change and flood control & health impacts. Accordingly, the Environment Management plan should be prepared keeping the concerned quarry and the surrounding habitations in the mind.
23. Rain water harvesting management with recharging details along with water balance (both monsoon & non-monsoon) be submitted.
24. Land use of the study area delineating forest area, agricultural land, grazing land, wildlife sanctuary, national park, migratory routes of fauna, water bodies, human settlements and other ecological features should be indicated. Land use plan of the mine lease area should be prepared to encompass preoperational, operational and post operational phases and submitted. Impact, if any, of change of land use should be given.
25. Details of the land for storage of Overburden/Waste Dumps (or) Rejects outside the mine lease, such as extent of land area, distance from mine lease, its land use, R&R issues, if any, should be provided.
26. Proximity to Areas declared as 'Critically Polluted' (or) the Project areas which attracts the court restrictions for mining operations, should also be indicated and where so required, clearance certifications from the prescribed Authorities, such as the TNPCB (or) Dept. of Geology and Mining should be secured and furnished to the effect that the proposed mining activities could be considered.
27. Description of water conservation measures proposed to be adopted in the Project should be given. Details of rainwater harvesting proposed in the Project, if any, should be provided.
28. Impact on local transport infrastructure due to the Project should be indicated.
29. A tree survey study shall be carried out (nos., name of the species, age, diameter etc.,) both within the mining lease applied area & 300m buffer zone and its management during mining activity.
30. A detailed mine closure plan for the proposed project shall be included in EIA/EMP report which should be site-specific.
31. As a part of the study of flora and fauna around the vicinity of the proposed site, the EIA coordinator shall strive to educate the local students on the importance of preserving local flora and fauna by involving them in the study, wherever possible.


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32. The purpose of Green belt around the project is to capture the fugitive emissions, carbon sequestration and to attenuate the noise generated, in addition to improving the aesthetics. A wide range of indigenous plant species should be planted as given in the appendix-I in consultation with the DFO, State Agriculture University. The plant species with dense/moderate canopy of native origin should be chosen. Species of small/medium/tall trees alternating with shrubs should be planted in a mixed manner.
33. Taller/one year old Saplings raised in appropriate size of bags, preferably ecofriendly bags should be planted as per the advice of local forest authorities/botanist/Horticulturist with regard to site specific choices. The proponent shall earmark the greenbelt area with GPS coordinates all along the boundary of the project site with at least 3 meters wide and in between blocks in an organized manner
34. A Disaster management Plan shall be prepared and included in the EIA/EMP Report for the complete life of the proposed quarry (or) till the end of the lease period.
35. A Risk Assessment and management Plan shall be prepared and included in the EIA/EMP Report for the complete life of the proposed quarry (or) till the end of the lease period.
36. Occupational Health impacts of the Project should be anticipated and the proposed preventive measures spelt out in detail. Details of pre-placement medical examination and periodical medical examination schedules should be incorporated in the EMP. The project specific occupational health mitigation measures with required facilities proposed in the mining area may be detailed.
37. Public health implications of the Project and related activities for the population in the impact zone should be systematically evaluated and the proposed remedial measures should be detailed along with budgetary allocations.
38. The Socio-economic studies should be carried out within a 5 km buffer zone from the mining activity. Measures of socio-economic significance and influence to the local community proposed to be provided by the Project Proponent should be indicated. As far as possible, quantitative dimensions may be given with time frames for implementation.
39. Details of litigation pending against the project, if any, with direction /order passed by any Court of Law against the Project should be given.
40. Benefits of the Project if the Project is implemented should be spelt out. The benefits of the Project shall clearly indicate environmental, social, economic, employment potential, etc.


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41. If any quarrying operations were carried out in the proposed quarrying site for which now the EC is sought, the Project Proponent shall furnish the detailed compliance to EC conditions given in the previous EC with the site photographs which shall duly be certified by MoEF&CC, Regional Office, Chennai (or) the concerned DEE/TNPCB.
42. The PP shall prepare the EMP for the entire life of mine and also furnish the sworn affidavit stating to abide the EMP for the entire life of mine.
43. Concealing any factual information or submission of false/fabricated data and failure to comply with any of the conditions mentioned above may result in withdrawal of this Terms of Conditions besides attracting penal provisions in the Environment (Protection) Act, 1986.

Appendix -I
List of Native Trees Suggested for Planting

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

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40	<i>Premna mollissima</i>	Munnai	முன்னை
41	<i>Premna serratifolia</i>	Narumunnai	நறு முன்னை
42	<i>Premna tomentosa</i>	Malaipoovarasu	மலை பூவரசு
43	<i>Prosopis cinerea</i>	Vanni maram	வன்னி மரம்
44	<i>Pterocarpus marsupium</i>	Vengai	வேங்கை
45	<i>Pterospermum canescens</i>	Vennangu, Tada	வெண்ணாங்கு
46	<i>Pterospermum xylocarpum</i>	Polavu	புலவு
47	<i>Puthranjiva roxburghii</i>	Karipala	கறிபாலா
48	<i>Salvadora persica</i>	Ugaa Maram	ஊகா மரம்
49	<i>Sapindus emarginatus</i>	Manipungan, Soapukai	மணிப்புங்கன் சோப்புக்காய்
50	<i>Saraca asoca</i>	Asoca	அசோகா
51	<i>Streblus asper</i>	Piray maram	பிராய் மரம்
52	<i>Strychnos nuxvomica</i>	Yetti	எட்டி
53	<i>Strychnos potatorum</i>	Therthang Kottai	தேத்தான் கொட்டை
54	<i>Syzygium cumini</i>	Naval	நாவல்
55	<i>Terminalia belleric</i>	Thandri	தான்றி
56	<i>Terminalia arjuna</i>	Ven marudhu	வெண் மருது
57	<i>Toona ciliata</i>	Sandhana vembu	சந்தன வேம்பு
58	<i>Thespesia populnea</i>	Puvarasu	பூவரசு
59	<i>Walsuratrifoliata</i>	valsura	வால்கரா
60	<i>Wrightia tinctoria</i>	Veppalai	வெப்பாலை
61	<i>Pithecellobium dulce</i>	Kodukkapuli	கொடுக்காப்புளி

Discussion by SEIAA and the Remarks:-

The subject was placed in the 687th authority meeting held on 09.01.2024. The authority noted that the subject was appraised in the 430th SEAC meeting held on 14.12.2023. After detailed discussions, the Authority accepts the recommendation of SEAC and decided to grant **Terms of Reference (ToR) along with Public Hearing** under cluster for undertaking the combined Environment Impact Assessment Study and preparation of separate Environment Management Plan subject to the conditions as recommended by SEAC & normal conditions & the conditions mentioned in 'Annexure B' of this minutes

Annexure 'B'

Cluster Management Committee

1. Cluster Management Committee shall be framed which must include all the proponents in the cluster as members including the existing as well as proposed quarry.
2. The members must coordinate among themselves for the effective implementation of EMP as committed including Green Belt Development, Water sprinkling, tree plantation, blasting etc.,
3. The List of members of the committee formed shall be submitted to AD/Mines before the execution of mining lease and the same shall be updated every year to the AD/Mines.

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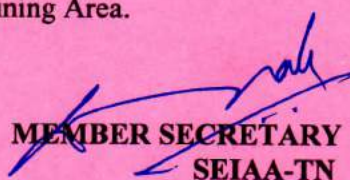
4. Detailed Operational Plan must be submitted which must include the blasting frequency with respect to the nearby quarry situated in the cluster, the usage of haul roads by the individual quarry in the form of route map and network.
5. The committee shall deliberate on risk management plan pertaining to the cluster in a holistic manner especially during natural calamities like intense rain and the mitigation measures considering the inundation of the cluster and evacuation plan.
6. The Cluster Management Committee shall form Environmental Policy to practice sustainable mining in a scientific and systematic manner in accordance with the law. The role played by the committee in implementing the environmental policy devised shall be given in detail.
7. The committee shall furnish action plan regarding the restoration strategy with respect to the individual quarry falling under the cluster in a holistic manner.
8. The committee shall furnish the Emergency Management plan within the cluster.
9. The committee shall deliberate on the health of the workers/staff involved in the mining as well as the health of the public.
10. The committee shall furnish an action plan to achieve sustainable development goals with reference to water, sanitation & safety.
11. The committee shall furnish the fire safety and evacuation plan in the case of fire accidents.

Impact study of mining

12. Detailed study shall be carried out in regard to impact of mining around the proposed mine lease area covering the entire mine lease period as per precise area communication order issued from reputed research institutions on the following
 - a) Soil health & soil biological, physical land chemical features .
 - b) Climate change leading to Droughts, Floods etc.
 - c) Pollution leading to release of Greenhouse gases (GHG), rise in Temperature, & Livelihood of the local people.
 - d) Possibilities of water contamination and impact on aquatic ecosystem health.
 - e) Agriculture, Forestry & Traditional practices.
 - f) Hydrothermal/Geothermal effect due to destruction in the Environment.
 - g) Bio-geochemical processes and its foot prints including environmental stress.
 - h) Sediment geochemistry in the surface streams.

Agriculture & Agro-Biodiversity

13. Impact on surrounding agricultural fields around the proposed mining Area.


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

Forests

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

Water Environment

23. Hydro-geological study considering the contour map of the water table detailing the number of ground water pumping & open wells, and surface water bodies such as rivers, tanks, canals, ponds etc. within 1 km (radius) so as to assess the impacts on the nearby waterbodies due to mining activity. Based on actual monitored data, it may clearly be shown whether working will intersect groundwater. Necessary data and documentation in this regard may be provided, covering the entire mine lease period.
24. Erosion Control measures.
25. Detailed study shall be carried out in regard to impact of mining around the proposed mine lease area on the nearby Villages, Water-bodies/ Rivers, & any ecological fragile areas.
26. The project proponent shall study impact on fish habitats and the food WEB/ food chain in the water body and Reservoir.


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27. The project proponent shall study and furnish the details on potential fragmentation impact on natural environment, by the activities.
28. The project proponent shall study and furnish the impact on aquatic plants and animals in water bodies and possible scars on the landscape, damages to nearby caves, heritage site, and archaeological sites possible land form changes visual and aesthetic impacts.
29. The Terms of Reference should specifically study impact on soil health, soil erosion, the soil physical, chemical components and microbial components.
30. The Environmental Impact Assessment should study on wetlands, water bodies, rivers streams, lakes and farmer sites.

Energy

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

Climate Change

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

Mine Closure Plan

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

EMP

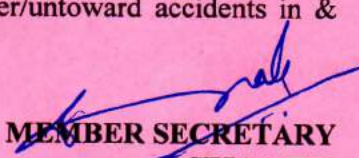
35. Detailed Environment Management Plan along with adaptation, mitigation & remedial strategies covering the entire mine lease period as per precise area communication order issued.
36. The Environmental Impact Assessment should hold detailed study on EMP with budget for Green belt development and mine closure plan including disaster management plan.

Risk Assessment

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

Disaster Management Plan

38. To furnish disaster management plan and disaster mitigation measures in regard to all aspects to avoid/reduce vulnerability to hazards & to cope with disaster/untoward accidents in &


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around the proposed mine lease area due to the proposed method of mining activity & its related activities covering the entire mine lease period as per precise area communication order issued.

Others

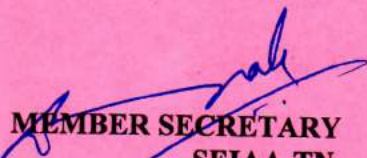
39. The project proponent shall furnish VAO certificate with reference to 300m radius regard to approved habitations, schools, Archaeological sites, Structures, railway lines, roads, water bodies such as streams, odai, vaari, canal, channel, river, lake pond, tank etc.
40. As per the MoEF& CC office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

A. STANDARD TERMS OF REFERENCE

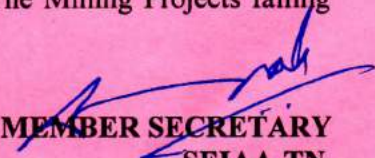
- 1) Year-wise production details since 1994 should be given, clearly stating the highest production achieved in any one year prior to 1994. It may also be categorically informed whether there had been any increase in production after the EIA Notification 1994 came into force, w.r.t. the highest production achieved prior to 1994.
- 2) A copy of the document in support of the fact that the Proponent is the rightful lessee of the mine should be given.
- 3) All documents including approved mine plan, EIA and Public Hearing should be compatible with one another in terms of the mine lease area, production levels, waste generation and its management, mining technology etc. and should be in the name of the lessee.
- 4) All corner coordinates of the mine lease area, superimposed on a High Resolution Imagery/ topo sheet, topographic sheet, geomorphology and geology of the area should be provided. Such an Imagery of the proposed area should clearly show the land use and other ecological features of the study area (core and buffer zone).
- 5) Information should be provided in Survey of India Topo sheet in 1:50,000 scale indicating geological map of the area, geomorphology of land forms of the area, existing minerals and mining history of the area, important water bodies, streams and rivers and soil characteristics.


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- 6) Details about the land proposed for mining activities should be given with information as to whether mining conforms to the land use policy of the State; land diversion for mining should have approval from State land use board or the concerned authority.
- 7) It should be clearly stated whether the proponent Company has a well laid down Environment Policy approved by its Board of Directors? If so, it may be spelt out in the EIA Report with description of the prescribed operating process/procedures to bring into focus any infringement/deviation/ violation of the environmental or forest norms/ conditions? The hierarchical system or administrative order of the Company to deal with the environmental issues and for ensuring compliance with the EC conditions may also be given. The system of reporting of non-compliances / violations of environmental norms to the Board of Directors of the Company and/or shareholders or stakeholders at large, may also be detailed in the EIA Report.
- 8) Issues relating to Mine Safety, including subsidence study in case of underground mining and slope study in case of open cast mining, blasting study etc. should be detailed. The proposed safeguard measures in each case should also be provided.
- 9) The study area will comprise of 10 km zone around the mine lease from lease periphery and the data contained in the EIA such as waste generation etc. should be for the life of the mine / lease period.
- 10) Land use of the study area delineating forest area, agricultural land, grazing land, wildlife sanctuary, national park, migratory routes of fauna, water bodies, human settlements and other ecological features should be indicated. Land use plan of the mine lease area should be prepared to encompass preoperational, operational and post operational phases and submitted. Impact, if any, of change of land use should be given.
- 11) Details of the land for any Over Burden Dumps outside the mine lease, such as extent of land area, distance from mine lease, its land use, R&R issues, if any, should be given.
- 12) Certificate from the Competent Authority in the State Forest Department should be provided, confirming the involvement of forest land, if any, in the project area. In the event of any contrary claim by the Project Proponent regarding the status of forests, the site may be inspected by the State Forest Department along with the Regional Office of the Ministry to ascertain the status of forests, based on which, the Certificate in this regard as mentioned above be issued. In all such cases, it would be desirable for representative of the State Forest Department to assist the Expert Appraisal Committees.

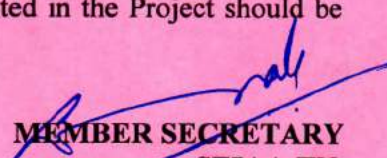

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- 13) Status of forestry clearance for the broken up area and virgin forestland involved in the Project including deposition of Net Present Value (NPV) and Compensatory Afforestation (CA) should be indicated. A copy of the forestry clearance should also be furnished.
- 14) Implementation status of recognition of forest rights under the Scheduled Tribes and other Traditional Forest Dwellers (Recognition of Forest Rights) Act, 2006 should be indicated.
- 15) The vegetation in the RF / PF areas in the study area, with necessary details, should be given.
- 16) A study shall be got done to ascertain the impact of the Mining Project on wildlife of the study area and details furnished. Impact of the project on the wildlife in the surrounding and any other protected area and accordingly, detailed mitigative measures required, should be worked out with cost implications and submitted.
- 17) Location of National Parks, Sanctuaries, Biosphere Reserves, Wildlife Corridors, Ramsar site Tiger/ Elephant Reserves/(existing as well as proposed), if any, within 10 km of the mine lease should be clearly indicated, supported by a location map duly authenticated by Chief Wildlife Warden. Necessary clearance, as may be applicable to such projects due to proximity of the ecologically sensitive areas as mentioned above, should be obtained from the Standing Committee of National Board of Wildlife and copy furnished.
- 18) A detailed biological study of the study area [core zone and buffer zone (10 km radius of the periphery of the mine lease)] shall be carried out. Details of flora and fauna, endangered, endemic and RET Species duly authenticated, separately for core and buffer zone should be furnished based on such primary field survey, clearly indicating the Schedule of the fauna present. In case of any scheduled-I fauna found in the study area, the necessary plan along with budgetary provisions for their conservation should be prepared in consultation with State Forest and Wildlife Department and details furnished. Necessary allocation of funds for implementing the same should be made as part of the project cost.
- 19) Proximity to Areas declared as 'Critically Polluted' or the Project areas likely to come under the 'Aravali Range', (attracting court restrictions for mining operations), should also be indicated and where so required, clearance certifications from the prescribed Authorities, such as the SPCB or State Mining Department should be secured and furnished to the effect that the proposed mining activities could be considered.
- 20) Similarly, for Coastal Projects, a CRZ map duly authenticated by one of the authorized agencies demarcating LTL, HTL, CRZ area, location of the mine lease with respect to CRZ, coastal features such as mangroves, if any, should be furnished. (Note: The Mining Projects falling


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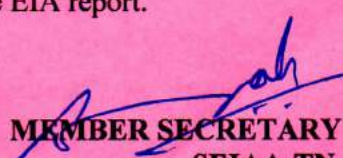
under CRZ would also need to obtain approval of the concerned Coastal Zone Management Authority).

- 21) R&R Plan/compensation details for the Project Affected People (PAP) should be furnished. While preparing the R&R Plan, the relevant State/National Rehabilitation & Resettlement Policy should be kept in view. In respect of SCs /STs and other weaker sections of the society in the study area, a need based sample survey, family-wise, should be undertaken to assess their requirements, and action programmes prepared and submitted accordingly, integrating the sectoral programmes of line departments of the State Government. It may be clearly brought out whether the village(s) located in the mine lease area will be shifted or not. The issues relating to shifting of village(s) including their R&R and socio-economic aspects should be discussed in the Report.
- 22) One season (non-monsoon) [i.e. March-May (Summer Season); October-December (post monsoon season) ; December-February (winter season)]primary baseline data on ambient air quality as per CPCB Notification of 2009, water quality, noise level, soil and flora and fauna shall be collected and the AAQ and other data so compiled presented date-wise in the EIA and EMP Report. Site-specific meteorological data should also be collected. The location of the monitoring stations should be such as to represent whole of the study area and justified keeping in view the pre-dominant downwind direction and location of sensitive receptors. There should be at least one monitoring station within 500 m of the mine lease in the pre-dominant downwind direction. The mineralogical composition of PM10, particularly for free silica, should be given.
- 23) Air quality modeling should be carried out for prediction of impact of the project on the air quality of the area. It should also take into account the impact of movement of Vehicles for 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


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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.


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- 35) Occupational Health impacts of the Project should be anticipated and the proposed preventive measures spelt out in detail. Details of pre-placement medical examination and periodical medical examination schedules should be incorporated in the EMP. The project specific occupational health mitigation measures with required facilities proposed in the mining area may be detailed.
- 36) Public health implications of the Project and related activities for the population in the impact zone should be systematically evaluated and the proposed remedial measures should be detailed along with budgetary allocations.
- 37) Measures of socio economic significance and influence to the local community proposed to be provided by the Project Proponent should be indicated. As far as possible, quantitative dimensions may be given with time frames for implementation.
- 38) Detailed Environmental Management Plan (EMP) to mitigate the environmental impacts which, should inter-alia include the impacts of change of land use, loss of agricultural and grazing land, if any, occupational health impacts besides other impacts specific to the proposed Project.
- 39) Public Hearing points raised and commitment of the Project Proponent on the same along with time bound Action Plan with budgetary provisions to implement the same should be provided and also incorporated in the final EIA/EMP Report of the Project.
- 40) Details of litigation pending against the project, if any, with direction /order passed by any Court of Law against the Project should be given.
- 41) The cost of the Project (capital cost and recurring cost) as well as the cost towards implementation of EMP should be clearly spelt out.
- 42) A Disaster management Plan shall be prepared and included in the EIA/EMP Report.
- 43) Benefits of the Project if the Project is implemented should be spelt out. The benefits of the Project shall clearly indicate environmental, social, economic, employment potential, etc.
- 44) Besides the above, the below mentioned general points are also to be followed:-
 - a) Executive Summary of the EIA/EMP Report
 - b) All documents to be properly referenced with index and continuous page numbering.
 - c) Where data are presented in the Report especially in Tables, the period in which the data were collected and the sources should be indicated.
 - d) Project Proponent shall enclose all the analysis/testing reports of water, air, soil, noise etc. using the MoEF&CC/NABL accredited laboratories. All the original analysis/testing reports should be available during appraisal of the Project.


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- e) Where the documents provided are in a language other than English, an English translation should be provided.
- f) The Questionnaire for environmental appraisal of mining projects as devised earlier by the Ministry shall also be filled and submitted.
- g) While preparing the EIA report, the instructions for the Proponents and instructions for the Consultants issued by MoEF&CC vide O.M. No. J-11013/41/2006-IA.II(I) dated 4th August, 2009, which are available on the website of this Ministry, should be followed.
- h) Changes, if any made in the basic scope and project parameters (as submitted in Form-I and the PFR for securing the TOR) should be brought to the attention of MoEF&CC with reasons for such changes and permission should be sought, as the ToR may also have to be altered. Post Public Hearing changes in structure and content of the draft EIA/EMP (other than modifications arising out of the P.H. process) will entail conducting the PH again with the revised documentation.
- i) As per the circular no. J-11011/618/2010-IA.II(I) dated 30.5.2012, certified report of the status of compliance of the conditions stipulated in the Environment Clearance for the existing operations of the project, should be obtained from the Regional Office of Ministry of Environment, Forest and Climate Change, as may be applicable.
- j) The EIA report should also include (i) surface plan of the area indicating contours of main topographic features, drainage and mining area, (ii) geological maps and sections and (iii) sections of the mine pit and external dumps, if any, clearly showing the land features of the adjoining area.

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

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

1. Project name and location (Village, District, State, Industrial Estate (if applicable)).
2. Process description in brief, specifically indicating the gaseous emission, liquid effluent and solid and hazardous wastes.
3. Measures for mitigating the impact on the environment and mode of discharge or disposal.
4. Capital cost of the project, estimated time of completion.
5. The proponent shall furnish the contour map of the water table detailing the number of wells located around the site and impacts on the wells due to mining activity.
6. A detailed study of the lithology of the mining lease area shall be furnished.


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7. Details of village map, "A" register and FMB sketch shall be furnished.
8. Detailed mining closure plan for the proposed project approved by the Geology of Mining department shall be submitted along with EIA report.
9. Obtain a letter /certificate from the Assistant Director of Geology and Mining standing that there is no other Minerals/resources like sand in the quarrying area within the approved depth of mining and below depth of mining and the same shall be furnished in the EIA report.
10. EIA report should strictly follow the Environmental Impact Assessment Guidance Manual for Mining of Minerals published February 2010.
11. Detail plan on rehabilitation and reclamation carried out for the stabilization and restoration of the mined areas.
12. The EIA study report shall include the surrounding mining activity, if any.
13. Modeling study for Air, Water and noise shall be carried out in this field and incremental increase in the above study shall be substantiated with mitigation measures.
14. A study on the geological resources available shall be carried out and reported.
15. A specific study on agriculture & livelihood shall be carried out and reported.
16. Impact of soil erosion, soil physical chemical and biological property changes may be assumed.
17. Site selected for the project - Nature of land - Agricultural (single/double crop), barren, Govt./ private land, status of its acquisition, nearby (in 2-3 km.) water body, population, within 10km other industries, forest, eco-sensitive zones, accessibility, (note - in case of industrial estate this information may not be necessary)
18. Baseline environmental data - air quality, surface and ground water quality, soil characteristic, flora and fauna, socio-economic condition of the nearby population
19. Identification of hazards in handling, processing and storage of hazardous material and safety system provided to mitigate the risk.
20. Likely impact of the project on air, water, land, flora-fauna and nearby population
21. Emergency preparedness plan in case of natural or in plant emergencies
22. Issues raised during public hearing (if applicable) and response given
23. CER plan with proposed expenditure.
24. Occupational Health Measures
25. Post project monitoring plan
26. The project proponent shall carry out detailed hydro geological study through intuitions/NABET Accredited agencies.


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27. A detailed report on the green belt development already undertaken is to be furnished and also submit the proposal for green belt activities.
28. The proponent shall propose the suitable control measure to control the fugitive emissions during the operations of the mines.
29. A specific study should include impact on flora & fauna, disturbance to migratory pattern of animals.
30. Reserve funds should be earmarked for proper closure plan.
31. A detailed plan on plastic waste management shall be furnished. Further, the proponent should strictly comply with, Tamil Nadu Government Order (Ms) No.84 Environment and forests (EC.2) Department dated 25.06.2018 regarding ban on one time use and throw away plastics irrespective of thickness with effect from 01.01.2019 under Environment (Protection) Act, 1986. In this connection, the project proponent has to furnish the action plan.

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

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


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further necessary action for obtaining environmental clearance in accordance with the procedure prescribed under the EIA Notification, 2006.

- The final EIA report shall be submitted to the SEIAA, Tamil Nadu for obtaining Environmental Clearance.
- The TORs with public hearing prescribed shall be **valid for a period of three years** from the date of issue, for submission of the EIA/EMP report as per OMNo.J-11013/41/2006-IA-II(I)(part) dated 29th August, 2017.


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Copy to:

1. The Additional Chief Secretary to Government, Environment & Forests Department, Govt. of Tamil Nadu, Fort St. George, Chennai - 9
2. The Chairman, Central Pollution Control Board, Parivesh Bhavan, CBD Cum-Office Complex, East Arjun Nagar, New Delhi 110032.
3. The Member Secretary, Tamil Nadu Pollution Control Board, 76, Mount Salai, Guindy, Chennai-600 032.
4. Monitoring Cell, IA Division, Ministry of Environment, Forests & CC, Paryavaran Bhavan, CGO Complex, New Delhi 110003
5. The District Collector, Tenkasi District.
6. The Assistant Director, Department of Geology & Mining, Tenkasi District.
7. Stock File.

TOR Reply of Proposed Rough stone & Gravel Quarry Over an Extent of 3.01.0 Ha

COMPLIANCE OF TOR CONDITIONS

Point wise compliance of ToR points issued by SEIAA, TN vide letter No. SEIAA-TN/F.No.10299/SEAC/1(a) ToR-1644/2024 Dated: 09.01.2024 for Mining of Minor Minerals in the Mine of “Proposed Rough stone & Gravel Quarry Over an Extent of 3.01.00 Ha at S.F.No. 302/1 (1.70.50Ha.), 304/1A (0.54.00Ha.) & 304/2A (0.76.50Ha.) at Anaikulam Village, Veerakeralampudur Taluk, Tenkasi District, Tamilnadu State.

ToR Ref.	Description	Response	Page Ref. in EIA Report
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.	Precise Area Communication Letter received from Joint Director/Assistant Director (i/c), Tenkasi vide letter Rc.No.M1/14953/2019 Dated 18.05.2023. Mining Plan was approved by the Joint Director/Assistant Director (i/c), Tenkasi vide letter Rc.No.M1/14953/2019 Dated 21.06.2023. As area is being exploited for the first time hence Year-wise production details since 1994 and before 1994 are not relevant or applicable. Proposed Production of Rough Stone & Gravel for five years is proposed in the EIA/EMP in chapter no-2.	Chapter-2 Table No.2.9 Page No.47

TOR Reply of Proposed Rough stone & Gravel Quarry Over an Extent of 3.01.0 Ha

		<table><tr><th>Year</th><th>Rough stone (m³)</th><th>Gravel (m³)</th></tr><tr><td>I</td><td>59,260</td><td>19,314</td></tr><tr><td>II</td><td>61,165</td><td>9,657</td></tr><tr><td>III</td><td>60,750</td><td>9,342</td></tr><tr><td>IV</td><td>58,985</td><td>27,084</td></tr><tr><td>V</td><td>63,005</td><td>-</td></tr><tr><td>Total</td><td>3,03,165</td><td>65,397</td></tr></table>	Year	Rough stone (m³)	Gravel (m³)	I	59,260	19,314	II	61,165	9,657	III	60,750	9,342	IV	58,985	27,084	V	63,005	-	Total	3,03,165	65,397	
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2.	A copy of document in support of the fact that the Proponent is the rightful lessee of the mine should be given.	The mine lease area of 3.01.00 hectare in Anaikulam Village for Rough stone and Gravel quarry approved by Joint Director/Assistant Director (i/c), Tenkasi vide letter Rc.No.M1/14953/2019 Dated 18.05.2023.	Annexure-III																					
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 and mining technology and should be in the name of the lessee.	All the documents i.e., Mining Plan, EIA and public hearing are compatible with each other in terms of ML area production levels, waste generation and its management and mining technology are compatible with one another. The mining plan of the project site has been submitted to The Deputy Director, Dept. of Geology & Mining, Tirunelveli	Annexure-VI Chapter- II																					
4	All corner coordinates of the mine lease area, superimposed on a High-Resolution Imagery/toposheet	Details of coordinates of all corners of proposed mining lease area have been incorporated in mining plan and	Chapter-2, Fig no. 2.2																					

TOR Reply of Proposed Rough stone & Gravel Quarry Over an Extent of 3.01.0 Ha

	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).	Chapter 2 of EIA/ EMP Report.	Page. no. 37
5	Information should be provided in Survey of India Topo sheet in 1:50,000 scale indicating geological map of the area, important water bodies, streams and rivers and soil characteristics	Topo map as attached in Chapter-2	Chapter-2, Fig no. 2.4 Page. no. 39
6.	Details about the land proposed for mining activities should be given with information as to whether 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	Details about the land proposed for mining activities should be given Chapter 2.	Chapter-2 Page 43
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	Noted.	

TOR Reply of Proposed Rough stone & Gravel Quarry Over an Extent of 3.01.0 Ha

	administrative order of the Company to deal with the environmental issues and for ensuring compliance with the EC conditions may also be given. The system of reporting of non- compliances / violations of environmental norms to the Board of Directors of the Company and/or shareholders or stakeholders at large may also be detailed in the EIA report.		
8	Issues relating to Mine Safety, including subsidence study in case of underground mining and slope study in case of open cast mining, blasting study etc. should be detailed. The proposed safeguard measures in each case should also be provided.	It is an open cast mining project. Blasting details are incorporated in chapter 2	Chapter-2, Page no.51
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.	Study area comprises of 10 km radius from the mine lease boundary. Key Plan showing core zone (ML area).	Chapter-2 Fig no. 2.5 Page no.40
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	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	Chapter-2, Table no. 2.4 Page no.42

TOR Reply of Proposed Rough stone & Gravel Quarry Over an Extent of 3.01.0 Ha

	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.	features has been prepared and incorporated in Chapter-3 of EIA/ EMP Report. There is no national park, migratory routes of fauna in the study area. Nellai Wildlife Sanctuary is located at a distance of 19.68 km, NW.	
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.	The overburden is in the form of Gravel formation, it has been removed earlier quarry operation. The excavated rough stone will be directly loaded into tipper to the needy crushers/ other buyers for road project and construction works for filling and levelling of low-lying areas.	Chapter-2, Page no.50
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,	Complied. The proposed mining lease area is not falling under forest land.	

TOR Reply of Proposed Rough stone & Gravel Quarry Over an Extent of 3.01.0 Ha

	the Certificate in this regard as mentioned above be issued. In all such cases, it would be desirable for representative of the State Forest Department to assist the Expert Appraisal Committees.		
13	Status of forestry clearance for the broken-up area and virgin forestland involved in the Project including deposition of net present value (NPV) and compensatory afforestation (CA) should be indicated. A copy of the forestry clearance should also be furnished.	The proposed mining lease area is not falling under forest land.	
14	Implementation status of recognition of forest rights under the Scheduled Tribes and other Traditional Forest Dwellers (Recognition of Forest Rights) Act, 2006 should be indicated.	Not Applicable. There is no involvement of forest land in the project area.	
15	The vegetation in the RF / PF areas in the study area, with necessary details, should be given.	Details of flora have been discussed in Chapter-3 of the EIA/EMP Report.	Chapter-3 Pg No. 64

TOR Reply of Proposed Rough stone & Gravel Quarry Over an Extent of 3.01.0 Ha

16	A study shall be got done to ascertain the impact of the Mining Project on wildlife of the study area and details furnished. Impact of the project on the wildlife in the surrounding and any other protected area and accordingly detailed mitigative measures required, should be worked out with cost implications and submitted.	There is a relatively poor sighting of animals in the core and buffer areas of the mining lease. No significant impact is anticipated	
17	Location of National Parks, Sanctuaries, Biosphere Reserves, Wildlife Corridors, Tiger/Elephant Reserves/ (existing as well as proposed), if any, within 10km 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.	There is no National Parks, Bird Sanctuaries, Biosphere Reserves, Wildlife Corridors, Tiger / Elephant Reserves / Critically Polluted areas within 10 km radius of the mining lease area. Nellai Wildlife Sanctuary is located at a distance of 19.68 km, W.	
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	Details biological study (flora & fauna) within 10 km radius of the project site have been incorporated in Chapter-3 of EIA/ EMP Report.	

TOR Reply of Proposed Rough stone & Gravel Quarry Over an Extent of 3.01.0 Ha

	out. Details of flora and fauna, 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 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.	No flora & fauna listed in scheduled I have been found in study area so there is no need of conservation plan. However, all care will be taken for protection of flora & fauna, if any in the lease hold area.	Chapter – 3 Pg No. 98
19	Proximity to Areas declared as ‘Critically Polluted’ or the Project areas likely to come under the ‘Aravali Range’, (attracting court restrictions for mining operations), should also be indicated and where so required, clearance certifications from the prescribed Authorities, such as the SPCB or State Mining Dept. Should be secured and furnished to the effect that the proposed mining activities could be considered.	The proposed mining lease area is not falling under critically polluted area.	
20	Similarly, for coastal projects, A CRZ map duly authenticated by one of the authorized agencies Similarly, for	There is no Coastal Zone within 15km radius of the project site.	

TOR Reply of Proposed Rough stone & Gravel Quarry Over an Extent of 3.01.0 Ha

	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 located in the mine lease area will be shifted or not. The issues	There is no Rehabilitation and resettlement is involved. Land classified as Patta land	

TOR Reply of Proposed Rough stone & Gravel Quarry Over an Extent of 3.01.0 Ha

	relating to shifting of Village including their R&R and socio-economic aspects should be discussed in the report.		
22	One season (non-monsoon) and (Summer Season), (Post monsoon) primary baseline data on ambient air quality 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 500m of the mine lease in the pre-dominant downwind direction. The mineralogical composition of PM10, particularly for free silica, should be given.	Baseline data collected during Summer Monsoon (December 2023 to February 2024) has been incorporated in EIA/EMP report. The key plan of monitoring station has been discussed in Chapter-4. Locations of the monitoring stations have been selected keeping in view the pre-dominant downwind direction and location of the sensitive receptors and also that they represent whole of the study area.	Chapter 3
23	Air quality modelling should be	Air quality modelling & Impact of	Chapter-4

TOR Reply of Proposed Rough stone & Gravel Quarry Over an Extent of 3.01.0 Ha

	carried out for prediction of impact of the project on the air quality of the area. It should also take into account the impact of movement of vehicles for transportation of mineral. The details of the model used and input parameters used for modelling should be provided. The air quality contours may be shown on a location map clearly indicating the location of the site, location of sensitive receptors, if any, and the habitation. The wind roses showing predominant wind direction may also be indicated on the map.	Air quality will be furnished in Final EIA report. Transportation of mineral during operation of mines will be done by road ODR through dumpers and the impact of movement of vehicles are incorporated in EIA/EMP report. Air quality modelling & Impact of Air quality will be furnished in Final EIA report.	Page No.116
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: 6.0 KLD Dust Suppression: 1.0 KLD Domestic Purpose: 1.5 KLD Plantation :3.5 KLD Domestic Water will be sourced from nearby Anaikulam village which is about 2.43 km W of the area.	Chapter-2 Page no.53
25	Necessary clearance from the Competent Authority for drawl of requisite quantity of water for the Project should be provided.	Not Applicable Water will be taken from nearby villages	
26	Description of water conservation measures proposed to be adopted in	At the last stage of mining operation, almost complete area will be worked to	

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	the Project should be given. Details of rainwater harvesting proposed in the Project, if any, should be provided.	restore the land to its optimum reclamation for future use as water reservoir.	
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 of the project on the water quality & its mitigation measures has been incorporated in Chapter-4 of EIA/EMP report.	Chapter-4 Page No.112
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. 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.	Maximum working depth:49.0 m BGL The ground water table is reported as 65m below surface ground level in nearby wells of this area. Now, the present quarry shall be proposed above the water table and hence, quarrying may not affect the ground water So mine working will not be intersecting the ground water table.	Chapter-2 Page no. 35
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 any stream crossing in the proposed quarry	Executive Summary
30	Information on site elevation,	Highest elevation: 194.0 MSL	Chapter-2

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	working depth, groundwater table etc. Should be provided both in AMSL and BGL. A schematic diagram may also be provided for the same.	Water Table Depth: 65 m Below Ground Level	Table no. 2.2 Page no. 35
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 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	Green Belt Development plan is proved given in Chapter 2.	Chapter-2
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	Impact on local transport infrastructure due to the project has been assessed. There shall not be much impact on local transport. Traffic density from the proposed mining activity has been incorporated in	Chapter-3 Page No.112

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	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	EIA/EMP report.	
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 shall be provided to the mine workers. Details are given in chapter-2 of EIA/EMP	Chapter-2
34	Conceptual post mining land use and Reclamation and Restoration of mined out areas (with plans and with adequate number of sections) should be given in the EIA report.	Conceptual post mining land use and Reclamation and restoration sectional plates are given in Mining Plan followed by Scheme of mining.	Mining plates Annexure VII
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 in the mining area may be detailed.	Suitable measure will be adopted to minimize occupational health impacts of the project. The project shall have positive impact on local environment. Details are given in chapter-10 of EIA/EMP.	Chapter-10 Pg No. 145

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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.	Suitable measure will be adopted to minimize occupational health impacts of the project.	Chapter-10 Pg No. 138
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.	Suitable measures have been discussed in Chapter 4	Chapter-4 Pg No. 109
38	Detailed environmental management plan 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 has been described in detail in Chapter-9 of the EIA/EMP Report.	Chapter-9 Pg No. 140
39	Public hearing points raised and commitment of the project proponent on the same along with time bound action plan to implement the same should be provided and incorporated in the final EIA/EMP Report of the Project.	Public Hearing proceedings will be furnished in Final EIA report	

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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.	Not applicable No. litigation is pending against the project in any court.																
41	The cost of the project (capital cost and recurring cost) as well as the cost towards implementation of EMP should clearly be spelt out.	<table><tr><th>S. No</th><th>Description</th><th>Cost</th></tr><tr><td>1</td><td>Investment Cost</td><td>10,00,000</td></tr><tr><td>2</td><td>Expenditure</td><td>1,18,68,000</td></tr><tr><td></td><td>Total</td><td>1,28,68,000/-</td></tr><tr><td colspan="3">Rs.1,28,68,000/-</td></tr></table>	S. No	Description	Cost	1	Investment Cost	10,00,000	2	Expenditure	1,18,68,000		Total	1,28,68,000/-	Rs.1,28,68,000/-			Chapter-8 Pg No. 142
S. No	Description	Cost																
1	Investment Cost	10,00,000																
2	Expenditure	1,18,68,000																
	Total	1,28,68,000/-																
Rs.1,28,68,000/-																		
42	Disaster Management Plan shall be prepared and included in the EIA/EMP Report.	Disaster Management and Risk Assessment has been incorporated in Chapter-7	Chapter-7 Pg No. 131															
43	Benefits of the project if the project is implemented should be spelt out. The benefits of the project shall clearly indicate environmental, social economic, employment potential etc.	Benefits of the project has incorporated	Chapter-8 Pg No. 138															
44	Besides the above, the below mentioned general points are also to be followed:																	
(a)	Executive Summary of the EIA/EMP report	Executive Summary of EIA Report is given from page No.10-26																
(b)	All documents to be properly referenced with index and continuous page numbering.	Complied																
(c)	Where data are presented in the report especially in tables, the period in which the data were collected and	Complied																

TOR Reply of Proposed Rough stone & Gravel Quarry Over an Extent of 3.01.0 Ha

	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.	Complied	
(e)	Where the documents provided are in a language other than English, an English translation should be provided.	Complied	
(f)	The Questionnaire for environmental appraisal of mining projects as devised earlier by the Ministry shall also be filled and submitted.	The complete questionnaire has been prepared	
(g)	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.	The EIA report has been prepared and complying with the circular issued by MoEF vide O.M. No. J-11013/41/2006-IA. II(I) dated 4 th August 2009.	
(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 with reasons for such changes and	There are no changes in prepared EIA as per submitted Form-1 & PFR	

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	permission should be sought, as the TOR may also have to be altered. Post Public Hearing changes in structure and content of the draft EIA/EMP (other than modifications arising out of the P.H. process) will entail conducting the PH again with the revised documentation		
(i)	As per the circular no. J-11011/618/2010-IA. II(I) dated 30.5.2012, report on the status of compliance of the conditions stipulated in the environment clearance for the existing operations of the project by the Regional Office of Ministry of Environment & Forest and climate change as may be applicable.	Will be complied after grant environment clearance from SEIAA, Tamilnadu.	
(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 (iii) sections of mine pit and external dumps, if any clearly showing the features of the adjoining area.	All Sectional Plates of Quarry is enclosed in Mining Plan.	

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Additional TOR by SEAC

SEAC Specific condition		
S.No.	Condition	Compliance
1.	The PP shall furnish the revised EMP based on the study carried out on impact of the dust & other environmental impact of the dust & other environmental impacts due to proposed quarrying operations on the nearby agricultural lands for remaining life of the mine in the format prescribed by the SEAC considering the cluster situation.	Noted and Agreed to comply.
2.	The PP shall prepare a conceptual working plan accommodating the remedial actions based on the scientific studies carried out to assess the slope stability of the working benches to be constructed and existing quarry wall including the common wall/pillar exists adjacent to a quarry, by involving any one of the reputed Research and Academic Institutions - CSIR-Central Institute of Mining & Fuel Research / Dhanbad, NIRM/Bangalore, Division of Geotechnical Engineering-IIT-Madras, NIT-Dept of Mining Engg, Surathkal, and Anna University Chennai-CEG Campus. The PP shall submit a copy of the aforesaid report indicating the stability status of the quarry wall and slope	Noted. Slope stability report will be furnished during Final EIA presentation.

TOR Reply of Proposed Rough stone & Gravel Quarry Over an Extent of 3.01.0 Ha

	stability action plan during the time of appraisal for obtaining the EC.																															
3.	The PP shall undertake Hydrogeology study considering nearby existing wells, Aquifers, Ground water & surface water levels etc within the radius of 1km.	Noted. Hydrogeology study will be furnished during Final EIA presentation.																														
SEAC Standard condition - ANNEXURE - I																																
1.	In the case of existing/operating mines, a letter obtained from the concerned AD (Mines) shall be submitted and it shall include the f following: (i) Original pit dimension (ii) Quantity achieved Vs EC Approved Quantity (iii) Balance Quantity as per Mineable Reserve calculated. (iv) Mined out Depth as on date Vs EC Permitted depth (v) Details of illegal/illicit mining (vi) Violation in the quarry during the past working. (vii) Quantity of material mined out outside the mine lease area (viii) Condition of Safety zone/benches (ix) Revised/Modified Mining Plan showing the benches of not exceeding 6 m height and ultimate depth of not exceeding 50m.	<table><tr><th>PIT</th><th>LENGTH (M)</th><th>WIDTH (M)</th><th>DEPTH (M)</th><th>GRAVEL VOLUME M³</th></tr><tr><td>PIT-1</td><td>117</td><td>111</td><td>(0-1M) 1.0</td><td>12,987</td></tr><tr><td>PIT-2</td><td>54</td><td>12</td><td>(1-2M) 1.0</td><td>648</td></tr><tr><td>PIT-3</td><td>140</td><td>54</td><td>(0-1M) 1.0</td><td>7,560</td></tr><tr><td>PIT-4</td><td>16</td><td>10</td><td>(1-2M) 1.0</td><td>160</td></tr><tr><td colspan="4">TOTAL EXCAVATED ALREADY</td><td>21,355</td></tr></table> - 2.0m - -	PIT	LENGTH (M)	WIDTH (M)	DEPTH (M)	GRAVEL VOLUME M³	PIT-1	117	111	(0-1M) 1.0	12,987	PIT-2	54	12	(1-2M) 1.0	648	PIT-3	140	54	(0-1M) 1.0	7,560	PIT-4	16	10	(1-2M) 1.0	160	TOTAL EXCAVATED ALREADY				21,355
PIT	LENGTH (M)	WIDTH (M)	DEPTH (M)	GRAVEL VOLUME M³																												
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PIT-4	16	10	(1-2M) 1.0	160																												
TOTAL EXCAVATED ALREADY				21,355																												
2.	Details of habitations around the proposed	Obtained and same has been attached as																														

TOR Reply of Proposed Rough stone & Gravel Quarry Over an Extent of 3.01.0 Ha

	mining area and latest VAO certificate regarding the location of habitations within 300m radius from the periphery of the site.	Annexure.
3.	The proponent is requested to carry out a survey and enumerate on the structures located within the radius of (i) 50 m, (ii) 100 m, (iii) 200 m and (iv) 300 m (v) 500m shall be enumerated with details such as dwelling houses with number of occupants, whether it belongs to the owner (or) not, places of worship, industries, factories, sheds, etc with indicating the owner of the building, nature of construction, age of the building, number of residents, their profession and income, etc	Noted and agreed to comply. The structures located within 300 m will be furnished in Final EIA Report.
4.	The PP shall submit a detailed hydrological report indicating the impact of proposed quarrying operations on the waterbodies like lake, water tanks, etc are located within 1 km of the proposed quarry.	The hydrological report within 1 km radius will be furnished in final EIA Presentation.
5.	The Proponent shall carry out Bio diversity study through reputed Institution and the same shall be included in EIA Report	The Bio diversity report will be included in final EIA Report.
6.	The DFO letter stating that the proximity distance of Reserve Forests, Protected Areas, Sanctuaries, Tiger reserve etc., up to a radius of 25 km from the proposed site.	Noted. The DFO letter will be submit during Final EIA Appraisal.
7.	In the case of proposed lease in an existing (or old) quarry where the benches are not formed (or) partially formed as per the	It is an Existing quarry. Previous quarrying operated period from 19.08.2010 to 18.08.2015 vide The District Collector

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	approved Mining Plan, the Project Proponent (PP) shall the PP shall carry out the scientific studies to assess the slope stability of the working benches to be constructed and existing quarry wall, by involving any one of the reputed Research and Academic Institutions - CSIR-Central Institute of Mining & Fuel Research / Dhanbad, NIRM/Bangalore, Division of Geotechnical Engineering-IIT-Madras, NIT-Dept of Mining Engg. Surathkal, and Anna University Chennai-CEG Campus. The PP shall submit a copy of the aforesaid report indicating the stability status of the quarry wall and possible mitigation measures during the time of appraisal for obtaining the EC.	Proceedings. Existing depth upto 4.0m.
8.	However, in case of the fresh/virgin quarries, the Proponent shall submit a conceptual 'Slope Stability Plan for the proposed quarry during the appraisal while obtaining the EC, when the depth of the working is extended beyond 30 m below ground level.	The depth of the quarrying operation is 49.0m below the ground level. The slope stability report will be submitted during the appraisal.
9.	The PP shall furnish the affidavit stating that the blasting operation in the proposed quarry is carried out by the statutory competent person as per the MMR 1961 such as blaster, mining mate, mine foreman, II/ Class mines manager	Noted and agreed to comply.

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	appointed by the proponent.	
10.	The PP shall present a conceptual design for carrying out only controlled blasting operation involving line drilling and muffle blasting in the proposed quarry such that the blast-induced ground vibrations are controlled as well as no fly rock travel beyond 30 m from the blast	Noted and Agreed to comply.
11.	The EIA Coordinators shall obtain and furnish the details of quarry/quarries operated by the proponent in the past, either in the same location or elsewhere in the State with video and photographic evidence. Ect.,	It is an Existing quarry. Operated by the same proponent. Photographic evidences will be submitted during Final EIA Appraisal meetings.
12.	If the proponent has already carried out the mining activity in the proposed mining lease area after 15.01.2016, then the proponent shall furnish the following details from AD/DD, mines,	Earlier operated period 2010 – 2015.
13.	What was the period of the operation and stoppage of the earlier mines with last work permit issued by the AD/DD mines?	2010 – 2015.
14.	Quantity of minerals mined out. • Highest production achieved in any one year • Detail of approved depth of mining. • Actual depth of the mining achieved earlier. • Name of the person already mined in that leases area.	-

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	• If EC and CTO already obtained, the copy of the same shall be submitted. • Whether the mining was carried out as per the approved mine plan (or EC if issued) with stipulated benches.	
15.	All corner coordinates of the mine lease area, superimposed on a High-Resolution Imagery/Topo sheet, topographic sheet, geomorphology, lithology and geology of the mining lease area should be provided. Such an Imagery of the proposed area should clearly show the land use and other ecological features of the study area (core and buffer zone).	Complied. All corners with coordinates of the mine lease area has attached with EIA report in chapter 2
16.	The PP shall carry out Drone video survey covering the cluster, green belt, fencing, etc.	The drone video survey covering the cluster, greenbelt, fencing etc will be attached in Final EIA Report.
17.	The proponent shall furnish photographs of adequate fencing, green belt along the periphery including replantation of existing trees & safety distance between the adjacent quarries & water bodies nearby provided as per the approved mining plan.	Complied. The photographs of fencing and greenbelt attached as per SEAC Recommendations.
18.	The Project Proponent shall provide the details of mineral reserves and mineable reserves, planned production capacity, proposed working methodology with justifications, the anticipated impacts of the mining operations on the surrounding environment, and the remedial measures	The details of Mineable and Planed production capacity have been attached in EIA Report in Executive Summary and the anticipated impacts of mining operation and the remedial measures has been discussed in Chapter 4. The mining methodology and impacts are followed as on prescribed norms

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	for the same.	by Government.
19.	The Project Proponent shall provide the Organization chart indicating the appointment of various statutory officials and other competent persons to be appointed as per the provisions of the Mines Act 1952 and the MMR, 1961 for carrying out the quarrying operations scientifically and systematically in order to ensure safety and to protect the environment.	Complied. Manpower requirements table attached in EIA Report Chapter 2.
20.	The Project Proponent shall conduct the hydro-geological study considering the contour map of the water table detailing the number of groundwater pumping & open wells, and surface water bodies such as rivers, tanks, canals, ponds, etc, within 1 km (radius) along with the collected water level data for both monsoon and non-monsoon seasons from the PWD/TWAD so as to assess the impacts on the wells due to mining activity, Based on actual monitored data, it may clearly be shown whether working will intersect groundwater. Necessary data and documentation in this regard may be provided.	Hydro geological study report will be submitted along final EIA report
21.	The proponent shall furnish the baseline data for the environmental and ecological parameters with regard to surface	The proponent has furnished the baseline data for the environmental and ecological parameters with regard to surface

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	water/ground water quality, air quality, soil quality & flora/fauna including traffic/vehicular movement study.	water/ground water quality, air quality, soil quality & flora/fauna including traffic/vehicular movement study details attached in EIA report chapter 3
22.	The Proponent shall carry out the Cumulative impact study due to mining operations carried out in the quarry specifically with reference to the specific environment in terms of soil health, biodiversity, air pollution, water pollution, climate change and flood control & health impacts. Accordingly, the Environment Management plan should be prepared keeping the concerned quarry and the surrounding habitations in the mind.	Noted. Agree to comply.
23.	Rainwater harvesting management with recharging details along with water balance (both monsoon & non-monsoon) be submitted.	Noted. Agree to comply
24.	Land use of the study area delineating forest area, agricultural land, grazing land, wildlife sanctuary, national park, migratory routes of fauna, water bodies, human settlements and other ecological features should be indicated. Land use plan of the mine lease area should be prepared to encompass preoperational, operational and post operational phases and submitted. Impact, if any, of change of land use should be given.	Current land use of the study area has attached in EIA report chapter 3. Operational and post operational land use will be submitted.

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25.	Details of the land for storage of Overburden/Waste Dumps (or) Rejects outside the mine lease, such as extent of land area, distance from mine lease, its land use, R&R issues, if any, should be provided.	The overburden is in the form of top soil and weathered rock formation. It will be quarried for filling purposes to nearby end users and part of soil will be preserved all along the boundary as barrier for afforestation.
26.	Proximity to Areas declared as Critically Polluted" (or) the Project areas which attracts the court restrictions for mining operations, should also be indicated and where so required, clearance certifications from the prescribed Authorities, such as the TNPCB (or) Dept. of Geology and Mining should be secured and furnished to the effect that the proposed mining activities could be considered.	Noted.
27.	Description of water conservation measures proposed to be adopted in the Project should be given. Details of rainwater harvesting proposed in the Project, if any, should be provided.	The ultimate pit at the end of the mining operation will be used for rainwater storage, the stored water will be used for green belt development and further the stored water will be used for domestic purposes (other than drinking) after proper treatment
28.	Impact on local transport infrastructure due to the Project should be indicated.	Impact on local transport infrastructure due to the Project should be indicated. Traffic impact assessment has given in EIA report chapter 3
29.	A tree survey study shall be carried out (nos, name of the species, age, diameter etc..) both within the mining lease applied area & 300m buffer zone and its management during mining activity.	No tree species were found inside the project site. only few shrubs and thorny bushes were present. Tree survey study details given in EIA report chapter 3.

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30.	A detailed mine closure plan for the proposed project shall be included in EIA/EMP report which should be site-specific.	Noted. The mine plan and mine closure plan has been approved by the Assistant Director, Department of Mining and Geology, Tenkasi District
31.	As a part of the study of flora and fauna around the vicinity of the proposed site, the EIA coordinator shall strive to educate the local students on the importance of preserving local flora and fauna by involving them in the study, wherever possible.	Noted. Agree to comply
32.	The purpose of Green belt around the project is to capture the fugitive emissions, carbon sequestration and to attenuate the noise generated, in addition to improving the aesthetics. A wide range of indigenous plant species should be planted as given in the appendix-I in consultation with the DFO, State Agriculture University. The plant species with dense/moderate canopy of native origin should be chosen. Species of small/medium/tall trees alternating with shrubs should be planted in a mixed manner.	Noted. Agree to comply
33.	Taller/one year old Saplings raised in appropriate size of bags, preferably ecofriendly bags should be planted as per the advice of local forest authorities/botanist/Horticulturist with regard to site specific choices. The	The green belt plan enclosed with mining plates in Annexure VI

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	proponent shall earmark the greenbelt area with GPS coordinates all along the long the boundary of the project site with at least 3 meters wide and in between blocks in an organized manner	
34.	A Disaster management Plan shall be prepared and included in the EIA/EMP Report for the complete life of the proposed quarry (or) till the end of the lease period.	Disaster management plan has prepared and enclosed in Chapter 7.
35.	A Risk Assessment and management Plan shall be prepared and included in the EIA/EMP Report for the complete life of the proposed quarry (or) till the end of the lease period.	Risk assessment and management plan has prepared and enclosed in chapter 7.
36.	Occupational Health impacts of the Project should be anticipated and the proposed preventive measures spelt out in detail. Details of pre-placement medical examination and periodical medical examination schedules should be incorporated in the EMP. The project specific occupational health mitigation measures with required facilities proposed in the mining area may be detailed	Occupational Health impacts of the project has prepared and incorporated in Environmental management plan.
37.	Public health implications of the Project and related activities for the population in the impact zone should be systematically evaluated and the proposed remedial measures should be detailed along with budgetary allocations	Suitable measure will be adopted to minimize occupational health impacts of the project.

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38.	The Socio-economic studies should be carried out within a 5 km buffer zone from the mining activity. Measures of socio-economic significance and influence to the local community proposed to be provided by the Project Proponent should be indicated. As far as possible, quantitative dimensions may be given with time frames for implementation.	The socio-economic study has been discussed in chapter 3.
39.	Details of litigation pending against the project, if any, with direction order passed by any Court of Law against the Project should be given.	No. litigation is pending against the project in any court.
40.	Benefits of the project if the project is implemented should be spelt out. The benefits of the Project shall clearly indicate environmental, social, economic, employment potential, etc.,	Benefits of the project has incorporated in EIA report chapter 8
41.	If any quarrying operations were carried out in the proposed quarrying site for which now the EC is sought, the Project Proponent shall furnish the detailed compliance to EC conditions given in the previous EC with the site photographs which shall duly be certified by MoEF&CC, Regional Office, Chennai (or) the concerned DEE/TNPCB.	Earlier operated period is 2010 to 2015 vide The Collector Proceedings only.
42.	The PP shall prepare the EMP for the entire life of mine and also furnish the sworn affidavit stating to abide the EMP	Noted. Agree to comply.

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	for the entire life of mine.	
43.	Concealing any factual information or submission of false/fabricated data and failure to comply with any of the conditions mentioned above may result in withdrawal of this Terms of Conditions besides attracting penal provisions in the Environment (Protection) Act, 1986.	Noted.

Additional TOR by SEIAA

Discussion by SEIAA and the Remarks: -		
Annexure 'B'		
Cluster Management Committee		
1	Cluster Management Committee shall be framed which must include all the proponents in the cluster as members including the existing as well as proposed quarry.	Noted All the proponents in the cluster is discussed in Chapter-2
2	The members must coordinate among themselves for the effective implementation of EMP as committed including Green Belt Development, Water sprinkling, tree plantation, blasting etc.,	Green belt development, water sprinkling, tree plantation is discussed in chapter 2
3	The List of members of the committee formed shall be submitted to AD/Mines before the execution of mining lease and the same shall be updated every year to the AD/Mines.	Agreed to comply
4	Detailed Operational Plan must be submitted which must include the blasting frequency with respect to the nearby quarry situated in the cluster, the usage of haul roads by the individual quarry in the form of route map and network.	Agreed to comply and will be submitted with final EIA report.

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5	The committee shall deliberate on risk management plan pertaining to the cluster in a holistic manner especially during natural calamities like intense rain and the mitigation measures considering the inundation of the cluster and evacuation plan	Risk management plan is discussed in Chapter-7
6	The Cluster Management Committee shall form Environmental Policy to practice sustainable mining in a scientific and systematic manner in accordance with the law. The role played by the committee in implementing the environmental policy devised shall be given in detail.	Agreed to comply. It will be furnished in final EIA report.
7	The committee shall furnish action plan regarding the restoration strategy with respect to the individual quarry falling under the cluster in a holistic manner.	Agreed to comply. It will be furnished in final EIA report.
8	The committee shall furnish the Emergency Management plan within the cluster.	Emergency management plan is discussed in chapter 7.
9	The committee shall deliberate on the health of the workers/staff involved in the mining as well as the health of the public.	Health of workers and staff is discussed in chapter 9.
10	The committee shall furnish an action plan to achieve sustainable development goals with reference to water, sanitation & safety.	Noted
11	The committee shall furnish the fire safety and evacuation plan in the case of fire accidents.	Noted
Impact study of mining		
12	Detailed study shall be carried out in regard to impact of mining around the proposed mine lease area covering the entire mine lease period as per	The biodiversity has been studied and discussed in chapter 3. The soil erosion map 10km

TOR Reply of Proposed Rough stone & Gravel Quarry Over an Extent of 3.01.0 Ha

	precise area communication order issued from reputed research institutions on the following. a) Soil health & bio-diversity b) Climate change leading to Droughts, Floods etc., c) Pollution leading to release Greenhouse gases (GHG), rise in Temperature & Livelihood of the local people. d) Possibilities of water containment and impact on aquatic ecosystem health. e) Agriculture, Forestry & Traditional practices. f) Hydrothermal/Geothermal effects due to destruction in the Environment. g) Bio-geochemical processes and its foot prints including environmental stress h) Sediment geochemistry in the surface streams Sediment geochemistry in the surface streams.	surrounding the project site has been given in chapter 3. The detailed study will be carried out and will be enclosed in the Draft EIA Report.
Agriculture & Agro-Biodiversity		
13	Impact on surrounding agricultural fields around the proposed mining area.	There is no agricultural fields around the proposed mining area
14	Impact on soil flora & vegetation around the project site	Impact on soil flora & vegetation around the project site discussed in Chapter-4
15	Details of type of vegetations including no. of trees & shrubs within the proposed mining area and. If so, transplantation of such vegetations all along the boundary of the proposed mining area shall committed mentioned in EMP.	The detailed study will be carried out and will be furnished in the Final EIA Report.

TOR Reply of Proposed Rough stone & Gravel Quarry Over an Extent of 3.01.0 Ha

16	The Environmental Impact Assessment should study the biodiversity, the natural ecosystem, the soil micro flora, fauna and soil seed banks and suggest measures to maintain the natural Ecosystem	Obtained and same has been attached as Annexure.
17	Action should specifically suggest for sustainable management of the area and restoration of ecosystem for flow of goods and services	Noted and public hearing details will be included along with final EIA report.
18	The project proponent shall study and furnish the impact of project on plantations in adjoining patta lands, Horticulture, Agriculture and livestock.	Noted and will be complied in Final EIA report.

Forests

19	The project proponent shall detail study on impact of mining on Reserve forests free ranging wildlife.	The biodiversity has been studied and discussed in chapter 3.
20	The Environmental Impact Assessment should study impact on forest, vegetation, endemic, vulnerable and endangered indigenous flora and fauna.	The biological environment impacts, and its mitigation measures has been given in Chapter 4
21	The Environmental Impact Assessment should study impact on standing trees and the existing trees should be numbered and action suggested for protection.	There is no existing trees in the project site and surrounding the project site. Only thorny shrubs were present.
22	The Environmental Impact Assessment should study impact on protected areas, Reserve Forests, National Parks, Corridors and Wildlife pathways, near project site.	The water environment impacts and its mitigation measures has been given in Chapter 4

Water Environment

23	Hydro-geological study considering the contour map of the water table detailing the number of ground water pumping & open wells, and surface	The EMP details has been given in Chapter 8
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TOR Reply of Proposed Rough stone & Gravel Quarry Over an Extent of 3.01.0 Ha

	water bodies such as rivers, tanks, canals, ponds etc. within 1 km (radius) so as to assess the impacts on the nearby waterbodies due to mining activity. Based on actual monitored data, it may clearly be shown whether working will intersect groundwater. Necessary data and documentation in this regard may be provided, covering the entire mine lease period.	
24	Erosional Control Measures.	Noted and will be complied in Final EIA report.
25	Detailed study shall be carried out in regard to impact of mining around the proposed mine lease area on the nearby Villages, Water bodies/ Rivers, & any ecological fragile areas.	There is no Reserve Forest within 1 km radius of the Project Site. Hence our project will not cause any damage to reserve forest. Also, we have received letter from DFO indicating the nearest reserve forest and attached with Annexures. There is no protected areas, National Parks, Corridors and Wildlife pathways near project site.
26	The project proponent shall study impact on fish habitats and the food WEB/ food chain in the water body and Reservoir.	Noted and will be complied in Final EIA report.
27	The project proponent shall study and furnish the details on potential fragmentation impact on natural environment, by the activities.	Noted. Agree to comply.
28	The PP shall study and furnish the impact on aquatic plants and animals in water bodies and possible scars on the landscape, damages to	Noted. Agree to comply.

TOR Reply of Proposed Rough stone & Gravel Quarry Over an Extent of 3.01.0 Ha

	nearby caves, heritage site and archaeological sites possible landform changes visual and aesthetic impacts	
29	The Terms of Reference should specifically study impact on soil health, soil erosion, the soil physical, chemical components and microbial components.	Noted. Agree to comply.
30	The Environmental Impact Assessment should study on wetlands, water bodies, rivers streams, lakes and farmer sites	Environmental Impact Assessment study is detailed in Chapter 3.
Energy		
31	The measures taken to control Noise, Air, Water, Dust Control and steps adopted to efficiently utilise the Energy shall be furnished.	Noted. Agree to comply.
Climate Change		
32	The Environmental Impact Assessment shall study in detail the carbon emission and also suggest the measures to mitigate carbon emission including development of carbon sinks and temperature reduction including control of other emission and climate mitigation activities	Agreed to comply
33	The Environmental Impact Assessment should study impact on climate change, temperature rise, pollution and above soil & below soil carbon stock.	A Risk Assessment and management Plan will be prepared and included in the final EIA/EMP Report.
Mine Closure Plan		
34	Detailed Mine Closure Plan covering the entire mine lease period as per precise area communication order issued	Mine closure plan has been attached along with mining plates as Annexure.
EMP		

TOR Reply of Proposed Rough stone & Gravel Quarry Over an Extent of 3.01.0 Ha

35	Detailed Environment Management Plan along with adaptation, mitigation & remedial strategies covering the entire mine lease period as per precise area communication order issued	Environment Management Plan has been described in detail in Chapter-10 of the Draft EIA/EMP Report.
36	The Environmental Impact Assessment should hold detailed study on EMP with budget for Green belt development and mine closure plan including disaster management plan.	
Risk Assessment		
37	To furnish risk assessment and management plan including anticipated vulnerabilities during operational and post operational phases of Mining.	A Risk Assessment and management Plan will be prepared and included in the final EIA/EMP Report.
Disaster Management Plan		
38	To furnish disaster management plan and disaster mitigation measures in regard to all aspects to avoid/reduce vulnerability to hazards & to cope with disaster/untoward accidents in & around the proposed mine lease area due to the proposed method of mining activity & its related activities covering the entire mine lease period as per precise area communication order issued.	A disaster management Plan will be prepared and included in the final EIA/EMP Report.
Others		
39	The project proponent shall furnish VAO certificate with reference to 300m radius regard to approved habitations, schools, Archaeological sites, Structures, railway lines, roads, water bodies such as streams, odal, vaari, canal, channel, river, lake pond, tank etc.	VAO certificate is enclosed as Annexure.
40	As per the MoEF& CC office memorandum	Agreed to comply

TOR Reply of Proposed Rough stone & Gravel Quarry Over an Extent of 3.01.0 Ha

	F.No 12-65/2017-IA III dated: 30.09.2020 and 20.10.2020 the proponent shall address the concerns raised during the public consultation and all the activities proposed shall be part of the Environment Management Plan	
41	The project proponent shall study and furnish the possible pollution due to plastic and microplastic on the environment. The ecological risks and impacts of plastic & microplastics on aquatic environment and freshwater systems due to activities, contemplated during mining may be investigated and reported.	Agreed to comply

ANNEXURE-II

PRECISE AREA COMMUNICATION LETTER

From

Thiru.L.Suresh.,
Joint Director/
Assistant Director (i/c),
Geology and Mining,
Tenkasi.

To

Thiru.N.H.M.Pandian,
S/o.Navaneethakrishna Pandian,
4/7, Kurunthan Mozhi,
Kuruchampatti Post,
V.K.Pudur Taluk,
Tenkasi District.

Rc.No.M1/14953/2019**Dated.18.05.2023****Sir,**

Sub: Mines and Quarries - Minor Minerals - Tenkasi District - Quarry lease application preferred by Thiru.N.H.M.Pandian for quarrying and transportation of Roughstone and Gravel - over an extent of 3.01.0 hectares of patta land in SF. Nos. 302/1, 304/1A & 304/2A of Anaikulam Village, V.K.Pudur Taluk - Precise area communicated - Approved Mining Plan - Called for - Reg.

Ref:

1. Quarry lease application preferred by Thiru.N.H.M.Pandian, Kuruchampatti, V.K.Pudur Taluk, dated. 24.04.2019.
2. The Revenue Divisional Officer, Tenkasi Letter No.A3/2173/2019, dated. 10.03.2020.
3. Inspection report of the Assistant Geologist, Geology and Mining, Tenkasi, dated. 22.03.2023.

Thiru.N.H.M.Pandian, S/o.Navaneethakrishna Pandian, 4/7, Kurunthan Mozhi, Kuruchampatti Post, V.K.Pudur Taluk, Tenkasi District has applied for grant of quarry lease for quarrying Roughstone and Gravel over an extent of 3.88.75 hectares of patta land in SF. Nos. 287/2 (0.44.5), 289/1B (0.20.5), 289/3 (0.23.0), 302/1 (1.70.5), 304/1A (0.54.0) & 304/2A (0.76.5) of Anaikulam Village, V.K.Pudur Taluk, Tenkasi District for a period of 5 years under Rule 19 (1) of Tamil Nadu Minor Mineral Concession Rules, 1959.

2. The Revenue Divisional Officer, Tenkasi and the Assistant Geologist of Geology and Mining, Tenkasi has furnished their reports in the reference 2nd and 3rd cited respectively and recommended for grant of quarry lease in the applied area subject to certain conditions.

3. Based on the recommendations of the Revenue Divisional Officer, Tenkasi and the Assistant Geologist of Geology and Mining, Tenkasi the quarry lease application preferred by Thiru.N.H.M.Pandian to grant of quarry lease for quarrying and transportation of Roughstone and Gravel is considered to grant of quarry lease for a period of 5 years and precise area is hereby communicated over an extent of 3.01.0 hectares of patta land in SF. Nos. 302/1 (1.70.50), 304/1A (0.54.0) & 304/2A (0.76.50) of Anaikulam Village, V.K.Pudur Taluk, Tenkasi District under Rule 19 of the Tamil Nadu Mineral Concession Rule 1959 and communicated to the applicant as per the power conferred under amended Rule 41(4) Tamil Nadu Minor Mineral Concession Rules, 1959 subject to following condition.

- i. A safety distance of 7.5 meters should be provided to the adjoining patta land.
- ii. 10 meters safety distance should be left maintained to the Government Poramboke Thattaparai in SF. Nos. 303, Government Poramboke Cart track in SF. Nos. 302/4 & odai located on the southern side of the applied area.
- iii. No hindrance shall be caused to the adjoining pattadars' lands while carrying out quarrying operations.
- iv. Environmental Clearance should be obtained from the State Level Environment Impact Assessment Authority.

4. In view of the above, you are hereby directed to submit mining plan duly prepared by a Recognized Qualified Person in respect of the precise area communicated for approval of the Joint Director/Assistant Director(i/c) of Geology and Mining, Tenkasi within a

period of 90 days from the date of receipt of this notice as required under rule 41 (5) of Tamil Nadu Minor Mineral Concession Rules, 1959.

5. You are further directed to produce Approved Mining Plan and Environmental Clearance obtained from the State Level Impact Assessment Authority (SEIAA) as required under Rule 42 of Tamil Nadu Minor Mineral Concession Rules, 1959 for grant of quarry lease for quarrying Roughstone and Gravel in respect of the precise area communicated.


Joint Director/
Assistant Director(i/c),
Geology and Mining,
Tenkasi.


18/5/23

ANNEXURE-III
MINING PLAN APPROVED LETTER

From

Thiru.L.Suresh., M.Sc.,
Joint Director/
Assistant Director(i/c),
Geology and Mining,
Tenkasi.

To

Thiru.N.H.M.Pandian,
S/o.Navaneethakrishna Pandian,
4/7, Kuruthan Mozhi,
Kuruchampatti Post,
V.K.Pudur Taluk,
Tenkasi District.

Rc.No.M1/14953/2019 dated. 21.06.2023

Sir,

Sub: Mines and Minerals - Minor Minerals - Roughstone and Gravel - Tenkasi District - Quarry lease application preferred by Thiru.N.H.M.Pandian for quarrying and transportation of Roughstone and Gravel - over an extent of 3.01.0 hectares of patta lands in SF. Nos. 302/1, 304/1A & 304/2A of Anaikulam Village, V.K.Pudur Taluk - precise area communicated - Mining plan submitted - Approval accorded - Reg.

Ref : 1. Quarry lease application preferred by Thiru.N.H.M.Pandian, Kuruchampatti, V.K.Pudur Taluk, dated. 24.04.2019.
2. Precise Area Communication letter in Rc. No.M1/14953/2019, dated. 18.05.2023.
3. Letter received from the applicant Thiru.N.H.M.Pandian, dt. 12.06.2023.

Thiru.N.H.M.Pandian, S/o.Navaneethakrishna Pandian, 4/7, Kurunthan Mozhi, Kuruchampatti Post, V.K.Pudur Taluk, Tenkasi District has applied for grant of quarry lease for quarrying Roughstone and Gravel over an extent of 3.88.75 hectares of patta land in SF. Nos. 287/2 (0.44.5), 289/1B (0.20.5), 289/3 (0.23.0), 302/1 (1.70.5), 304/1A (0.54.0) & 304/2A (0.76.5) of Anaikulam Village, V.K.Pudur Taluk, Tenkasi District for

a period of 5 years under Rule 19 (1) of Tamil Nadu Minor Mineral Concession Rules, 1959.

2. Based on the recommendations of the Revenue Divisional Officer, Tenkasi and the Assistant Geologist of Geology and Mining, Tenkasi precise area was communicated to Thiru.N.H.M.Pandian for grant of quarry lease for quarrying and transportation of Roughstone and Gravel over an extent of 3.01.0 hectares of patta lands in SF. Nos. 302/1 (1.70.50), 304/1A (0.54.0) & 304/2A (0.76.50) of Anaikulam Village, V.K.Pudur Taluk, Tenkasi District for a period of 5 years vide reference 2nd cited.

3. In response to the precise area communicated, the applicant has submitted three copies of draft Mining Plan duly prepared by a Qualified Person and requested for approval of the same vide reference 3rd cited.

4. The draft Mining Plan submitted in respect of the precise area communicated have been verified with reference to field conditions. All the conditions stipulated in the precise area communicated have been incorporated in the Mining Plan. The required safety distance of 7.5 meters to the adjacent patta lands and 10 meters to the government poramboke thattaparai and government cart track located on the southern side of the applied area have been clearly demarcated.

5. In exercise of the powers vested under sub rule (2) and (5) of Rule 41 of Tamil Nadu Minor Mineral Concession Rules, 1959, I hereby approve the mining plan subject to the following conditions:-

- i. The mining plan is approved without prejudice to any other order or direction from any court of contempt jurisdiction.
- ii. The mining plan is approved without prejudice to any other Law applicable to the quarry lease from time to time whether such laws are made by the Central Government, State Government or any other authority.
- iii. The approval of the mining plan does not in any way imply the approval of the Government in terms of any other provisions of the Mines and Minerals (Development and Regulation) Act 1957, or any other connected laws including Forest (Conservation) Act, 1980, Forest Conservation Rules, 1981, Environment Protection Act, 1980, Indian Explosives Act, 1884 (Central Act IV of 1884) and the Rules made there under and the Tamil Nadu Minor Mineral Concession Rules, 1959.
- iv. Quarrying operations should be carried out in accordance with the Approved Mining Plan.
- v. The applicant is entitled for production of 3,03,165 cbm of Roughstone, 65,397 cbm of Gravel upto a depth of 49 meters for a period of 5 years as per the Mining Plan.
- vi. A safety distance of 7.5 meters should be provided to the adjoining patta land.
- vii. 10 meters safety distance should be left maintained to the Government poramboke Thattaparai in SF. No.303, Government poramboke cart track in SF. No.302/4 & odai located on the southern side of the applied area.

- viii. No hindrance shall be caused to the adjoining pattadars' lands while carrying out quarrying operations.
- ix. Environmental Clearance should be obtained from the State Level Environment Impact Assessment Authority, Chennai.

6. As directed by the Joint Director/Assistant Director(i/c) of Geology and Mining, Tenkasi in the reference 2nd cited, you are hereby requested to produce Environmental Clearance obtained from the State Level Environment Impact Assessment Authority (SEIAA), Chennai as applicable under Rule 42 of Tamil Nadu Minor Mineral Concession Rules, 1959 for grant of quarry lease, in respect of the precise area communicated.

Encl: Approved Mining plan.

90


Joint Director/
Assistant Director(i/c),
Geology and Mining,
Tenkasi.


21/10/23

ANNEXURE-IV
500M Radius letter

From

Thiru.L.Suresh., M.Sc.,
Joint Director/
Assistant Director(i/c),
Geology and Mining,
Tenkasi.

To

Thiru.N.H.M.Pandian,
S/o.Navaneethakrishna Panidan,
4/7, Kuruthan Mozhi,
Kuruchampatti Post,
V.K.Pudur Taluk,
Tenkasi District.

Rc.No.M1/14953/2019, dated. 21 .07.2023

Sir,

Sub: Mines and Minerals - Minor Minerals - Roughstone and Gravel - Tenkasi District - Quarry lease application preferred by Thiru.N.H.M.Pandian, S/o.Navaneethakrishna Pandian for quarrying and transportation of Roughstone and Gravel - over an extent of 3.01.0 hectares of patta lands in SF. Nos. 302/1, 304/1A & 304/2A of Anaikulam Village, V.K.Pudur Taluk - Certain Particulars requested - for obtaining Environmental Clearance - furnished - reg.

- Ref:**
1. Quarry lease application preferred by Thiru.N.H.M.Pandian, Kuruchampatti, V.K.Pudur Taluk, dated. 24.04.2019.
 2. Precise Area Communication letter in Rc. No.M1/14953/2019, dated. 18.05.2023.
 3. Mining Plan Approval letter No. M1/14953/2019, dated. .07.2023.
 4. Letter received from the applicant Thiru.N.H.M.Pandian, dt. 12.06.2023.

Thiru.N.H.M.Pandian, S/o.Navaneethakrishna Pandian, 4/7, Kurunthan Mozhi, Kuruchampatti Post, V.K.Pudur Taluk, Tenkasi District has applied for grant of quarry lease for quarrying Roughstone and Gravel over an extent of 3.88.75 hectares of patta land in SF. Nos. 287/2 (0.44.5), 289/1B (0.20.5), 289/3 (0.23.0), 302/1 (1.70.5), 304/1A (0.54.0) & 304/2A (0.76.5) of Anaikulam Village, V.K.Pudur Taluk, Tenkasi District for

a period of 5 years under Rule 19 (1) of Tamil Nadu Minor Mineral Concession Rules, 1959.

2. Based on the recommendations of the Revenue Divisional Officer, Tenkasi and the Assistant Geologist of Geology and Mining, Tenkasi precise area was communicated to Thiru.N.H.M.Pandian for grant of quarry lease for quarrying and transportation of Roughstone and Gravel over an extent of 3.01.0 hectares of patta lands in SF. Nos. 302/1 (1.70.50), 304/1A (0.54.0) & 304/2A (0.76.50) of Anaikulam Village, V.K.Pudur Taluk, Tenkasi District for a period of 5 years vide reference 2nd cited.

3. The Mining Plan submitted by the lessee, Thiru.N.H.M.Pandian, S/o.Navaneethakrishna Pandian for quarrying roughstone has been approved vide this office letter No.M1/14953/2019, dated. .07.2023 for obtaining Environmental Clearance as per the newly introduced Rule Number 41 and 42 of Mineral Concession Rules 1959.

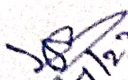
4. In the reference 4th cited, Thiru.N.H.M.Pandian, S/o.Navaneethakrishna Pandian has requested to furnish certain particulars such as existing / proposed / abandoned mines within a radial distance of 500 meters from the periphery of the existing mining lease hold area for obtaining environmental clearance from the State Level Environment Impact Assessment Authority, Chennai.

5. The details of quarry leases falling within a radial distance of 500 meters from the subject leasehold area are furnished below:-

Sl. No	Name of the Lessee	Village & SF. No.	Extent - Hects	Lease status
a. Details of Abandoned Quarries				
Nil				

b. Details of Expired Quarries				
Nil				
c. Details of Existing Quarries				
1.	Thiru.M.Abdul Ali, S/o.Mohammed Sharffudhin, No.8, Moonusuzhi Road, Vadakarai Village, Shenkottai Taluk, Tenkasi District .	SF. Nos. 1, 2, 11/2 & 12, Surandai Part-I (V)	4.00.0	27.03.2023 to 26.03.2024
2.	Thiru.D.Sankaranarayanan, S/o.Durairaj, 9-7-7/1, Bus Stand Road, Surandai, Veerakeralampudur, Tenkasi Taluk and District.	SF. Nos. 279/3A(P) & 279/4(P)	0.98.50	10.10.2022 to 09.10.2027
c. Present Proposed Quarries				
1.	N.H.M.Pandian, S/o.Navaneethakrishna Pandian, 4/7, Kuruthan Mozhi, Kuruchampatti Post, V.K.Pudur Taluk, Tenkasi District.	SF. Nos. 302/1, 304/1A & 304/2A Anaikulam Village	3.01.0	Instant proposal


 Joint Director/
 Assistant Director(I/c),
 Geology and Mining,
 Tenkasi.


 21/7/23

ANNEXURE-V
FMB, A REGISTER, VILLAGE MAP

District : Tenkasi

Taluk : Veerakeralampudur

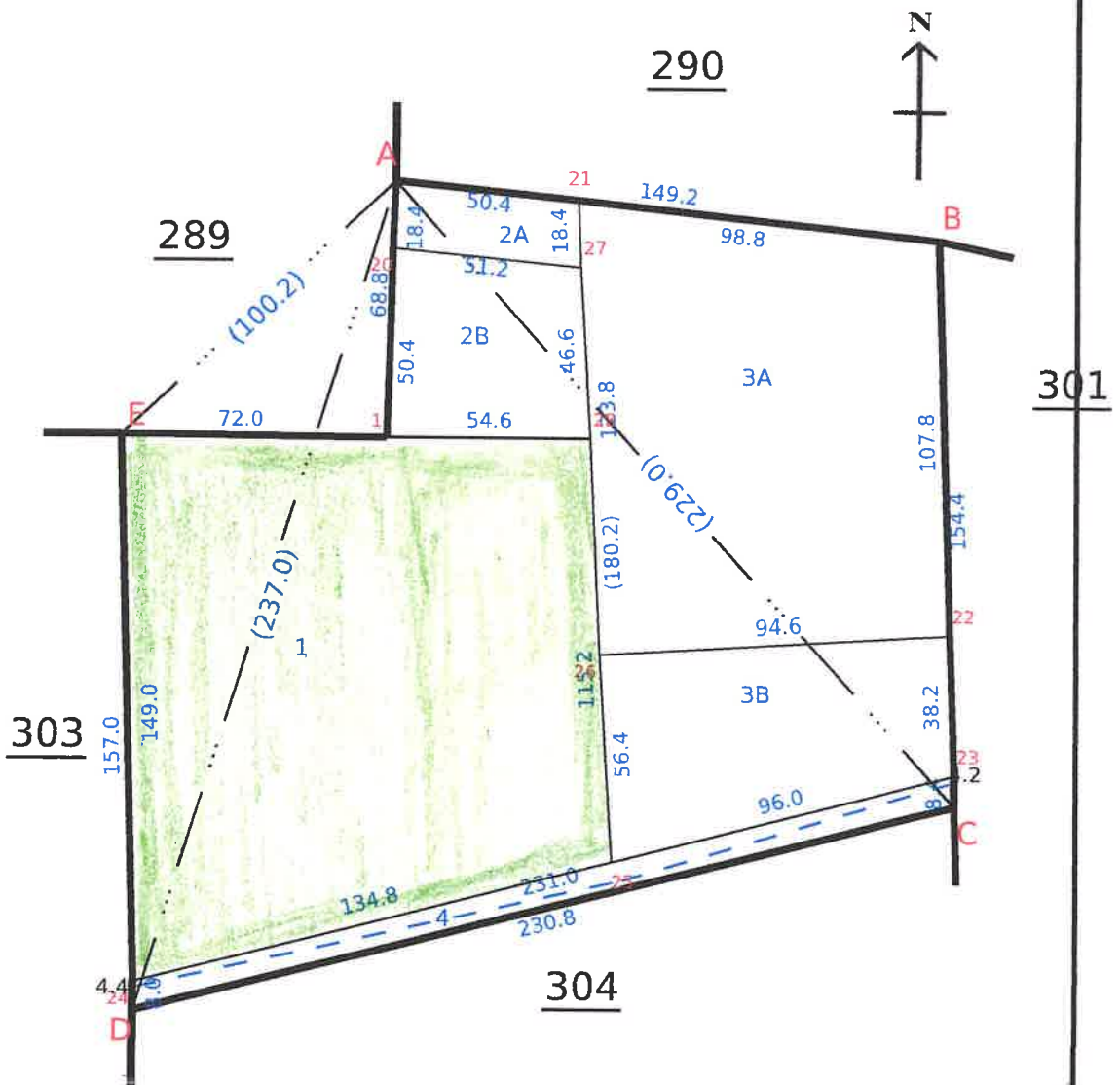
Village : Anaikulam [4]



Survey No : 302

Area : Hect 03 Ares 85.50

Scale : 1 : 2000



T.S. Ganesan
T.S. GANESAN, M.Sc.,
RQP/MAS/142/2000/A

N.H.M. Pachan

Date of Issue: 19-05-2023 16:19:56

240 fv.1



District : Tenkasi

Taluk : Veerakeralampudur

Village : Anaikulam

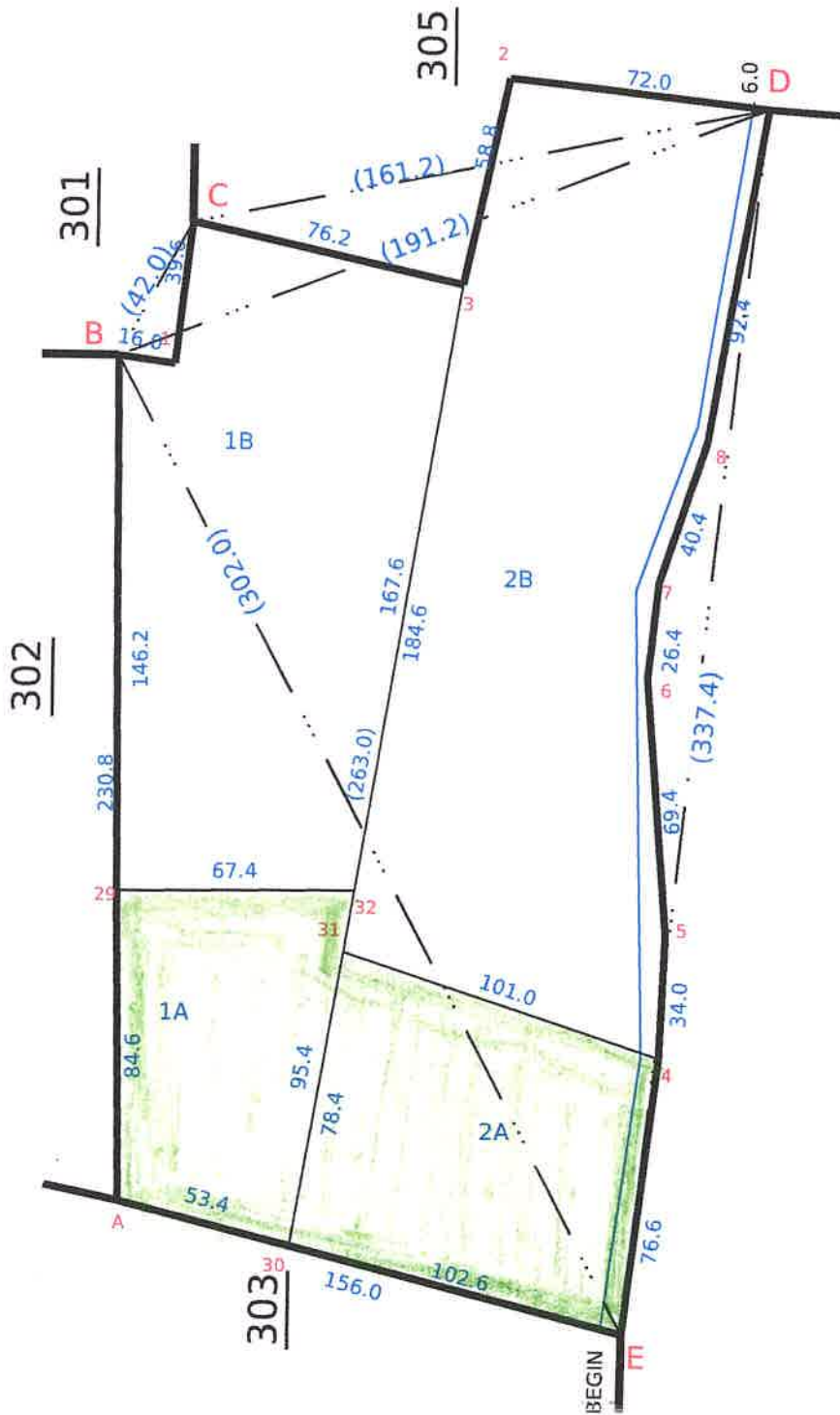
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Survey No : 304

Area : Hect 04 Ares 78.00

Scale : 1 : 2000



V.NO.8.KURICHAM PATTI

T.S. Ganesan
T.S. GANESAN, M.Sc.,
RQP/MAS/142/2000/A

N.H.M. Pothan

Date of Issue: 24-05-2023 23:18:44

240 fv.1



பெயர் : (10)கிராமம்

பெயர் : கிராமம்

பெயர் : 302



		C		
		229.0		
B	100.4	110.4	A	
		237.0		
E	50.8	117.4	D	
		100.2	A	
		52.4		49.4
		E		

True copy

சென்னை
விவரணையுரை

பெயர் : 302

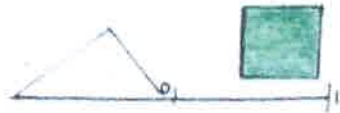
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அளவு : 1 : 2000 க.மீ

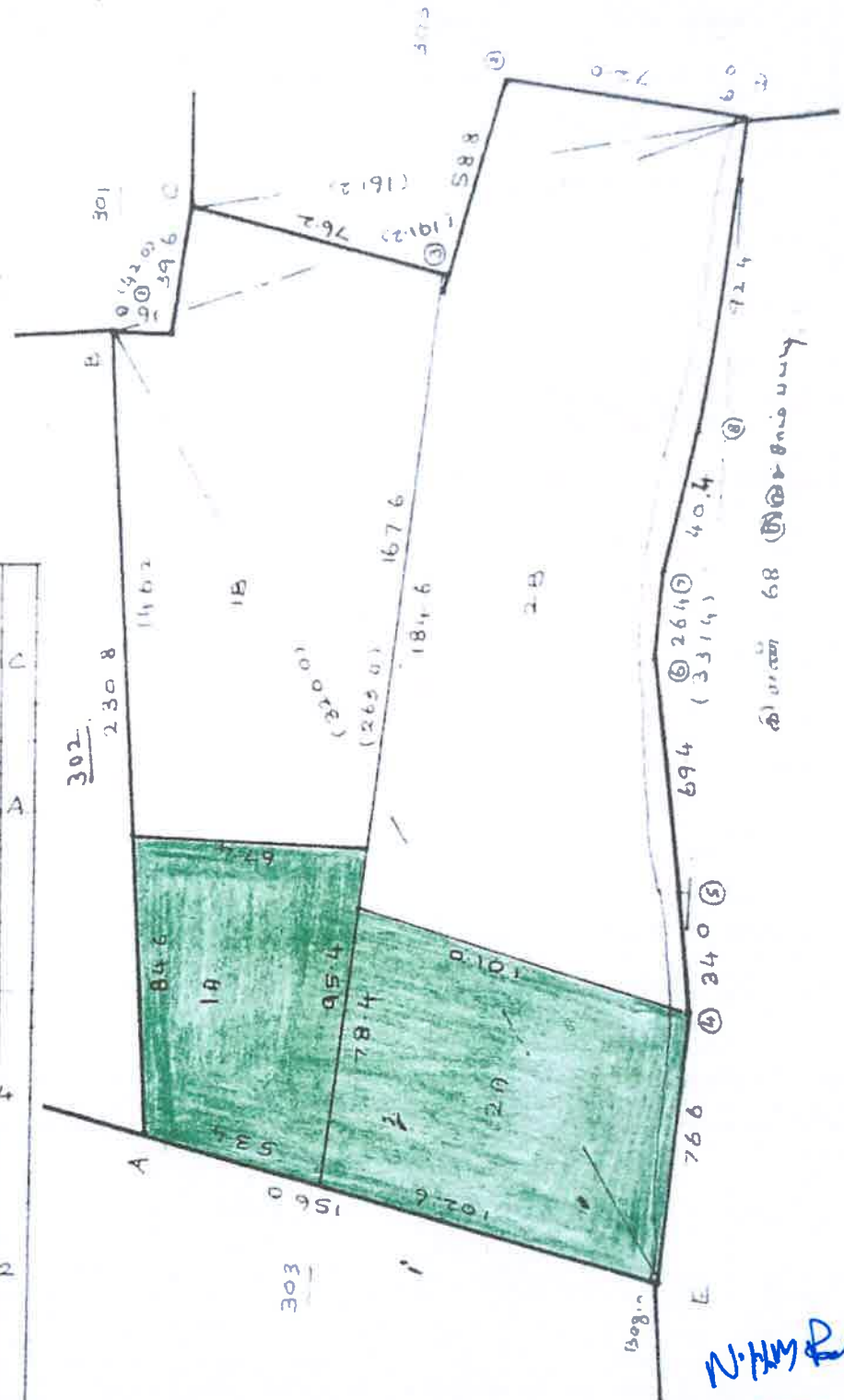
N.H.M. Sankar

சிறப்பம்



பகுதி 304/10, 20 (சிறப்பம்)
பிழைப்பு அலுவலகம்

		B		
		191.2		
		157.2	270.1	C
		D		
		E		
		320.0		
		205.0	106.0	A
		B		
		D		
		337.4		
8	6.2	244.6		
7	14.2	204.8		
6	14.2	178.6		
5	1.6	110.0		
		76.0	10.4	
		E		
		C		
3	31.6	161.2		
		92.0		
		68.6	220.2	
		D		
		B		
		42.0		
1	15.0	36.8		
		C		



N.H.M. Plan

Am-Don 26/10/20

அளவு. 1:2000 மீட்டர்

சுற்றுலா
விடுதலை
விடுதலை

Patel Deputy Inspector of Survey,
Veerakeralamundar.

	2	3	4	5	6	7	8	9	10	11	12
										By	
										MINING PLAN APPROVED	
										Assistant Director	
										of Mining	
299	1	..	ர	பு	..	7-5	6	0 37	1 11	0 41	273 சீ. சுப்ரமணிய நாடார்.
	2	..	ர	பு	..	7-5	6	0 37	1 06	0 39	118 என். எச். எம். பாண்டியன் (1), கற்பகசுப்பிரமணியபாண்டியன் (2), மீனாட்சிசுந்தரபாண்டியன் (3).
	3	..	ர	பு	..	7-5	6	0 37	1 10	0 41	118 என். எச். எம். பாண்டியன் (1), கற்பகசுப்பிரமணியபாண்டியன் (2), மீனாட்சிசுந்தரபாண்டியன் (3).
	4	..	ர	பு	..	7-5	6	0 37	1 18	0 44	118 என். எச். எம். பாண்டியன் (1), கற்பகசுப்பிரமணியபாண்டியன் (2), மீனாட்சிசுந்தரபாண்டியன் (3).
	5	..	ர	பு	..	7-5	6	0 37	5 33	1 97	118 என். எச். எம். பாண்டியன் (1), கற்பகசுப்பிரமணியபாண்டியன் (2), மீனாட்சிசுந்தரபாண்டியன் (3).
									9 78	3 62	
300	1	..	ர	பு	..	7-5	6	0 37	6 92	2 56	118 என். எச். எம். பாண்டியன் (1), கற்பகசுப்பிரமணியபாண்டியன் (2), மீனாட்சிசுந்தரபாண்டியன் (3).
	2	..	ச	புற	..	..	..	..	0 65	..	வண்டிப் பாதை.
	3	..	ர	பு	..	7-5	6	0 37	0 72	0 27	118 என். எச். எம். பாண்டியன் (1), கற்பகசுப்பிரமணியபாண்டியன் (2), மீனாட்சிசுந்தரபாண்டியன் (3).
									8 29	2 83	
301	1	..	ர	பு	..	7-5	6	0 37	5 44	2 01	264 மு. சுப்ரமணிய நாடார்.
	2	..	ச	புற	..	..	..	..	0 26	..	வண்டிப் பாதை.
	3	..	ர	பு	..	7-5	6	0 37	0 44	0 16	264 மு. சுப்ரமணிய நாடார்.
									6 14	2 17	
302	1	✓	ர	பு	..	7-5	6	0 37	4 23	1 57	730 ச. முகமது ஈரவத்தர் (1), ச. முகமது மீரான் ராவுத்தர் (2).
	2	..	ர	பு	..	7-5	6	0 37	0 85	0 31	118 என். எச். எம். பாண்டியன் (1), கற்பகசுப்பிரமணியபாண்டியன் (2), மீனாட்சிசுந்தரபாண்டியன் (3).
	3	..	ர	பு	..	7-5	6	0 37	3 96	1 47	118 என். எச். எம். பாண்டியன் (1), கற்பகசுப்பிரமணியபாண்டியன் (2), மீனாட்சிசுந்தரபாண்டியன் (3).
									0 49	..	வண்டிப் பாதை.
									9 53	3 35	
									8 96	..	
303	1	..	ர	பு	..	7-5	6	0 37	4 90	1 81	118 என். எச். எம். பாண்டியன் (1), கற்பகசுப்பிரமணியபாண்டியன் (2), மீனாட்சிசுந்தரபாண்டியன் (3).
304	1	..	ர	பு	..	7-5	6	0 37	4 90	1 81	118 என். எச். எம். பாண்டியன் (1), கற்பகசுப்பிரமணியபாண்டியன் (2), மீனாட்சிசுந்தரபாண்டியன் (3).

True copy

அரசாங்க அலுவலர்

கிராம நிர்வாக அலுவலர்

ஆண்குளம் கிராமம்

303 ச. த.

304 1 .. ர பு .. 7-5 6 0 37

245

1	2	3	4	5	6	7	8	9	10	11	12
							ரு.பை.	ஏ.செ.	ரு.பை.		
104	2	...	4	...	7-5	6	0 37	6 91	2 56	118	என். எச். எம். பாண்டியன் (1), கற்பகசுப்பிரமணிய பாண்டியன் (2), மீனாட்சுந்தர பாண்டியன் (3).
								11 81	4 37		
105	1	...	4	...	7-5	6	0 37	3 70	1 37	118	என். எச். எம். பாண்டியன் (1), கற்பகசுப்பிரமணிய பாண்டியன் (2), மீனாட்சுந்தர பாண்டியன் (3).
	2	...	4	...	7-5	6	0 37	2 83	1 45	118	என். எச். எம். பாண்டியன் (1), கற்பகசுப்பிரமணிய பாண்டியன் (2), மீனாட்சுந்தர பாண்டியன் (3).
								6 53	2 42		
106	...	...	4	...	7-5	6	0 37	7 52	2 78	118	என். எச். எம். பாண்டியன் (1), கற்பகசுப்பிரமணிய பாண்டியன் (2), மீனாட்சுந்தர பாண்டியன் (3).
107	1	...	4	...	7-5	6	0 37	3 98	1 47	118	என். எச். எம். பாண்டியன் (1), கற்பகசுப்பிரமணிய பாண்டியன் (2), மீனாட்சுந்தர பாண்டியன் (3).
	...	...	4	...	...	...	...	0 77	...		வண்டிப் பாதை.
								4 75	1 47		
108	...	...	4	...	7-5	6	0 37	9 35	3 46	118	என். எச். எம். பாண்டியன் (1), கற்பகசுப்பிரமணிய பாண்டியன் (2), மீனாட்சுந்தர பாண்டியன் (3).
109	...	...	4	...	7-5	6	0 37	6 52	2 41	118	என். எச். எம். பாண்டியன் (1), கற்பகசுப்பிரமணிய பாண்டியன் (2), மீனாட்சுந்தர பாண்டியன் (3).
	...	...	4	...	...	...	...	1 09	...		ஒடை.

ஆக மொத்தம் ... 2,141 21 1,364 66

ரூபாய் ஆயிரத்தி முன் ஓரற்றி அறுபத்தி நான் சூம்பைசா அறுபத்தாறு மட்டும்.

கிராம நிவாரண அலுவலர்
4. கைங்குளம் கிராமம்
நெல்லைமதுரை வட்டம்

தென்காசி,
21-4-1961.

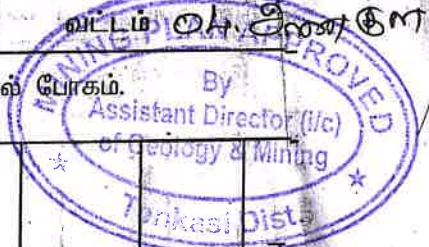
V. சங்கரன்,
உதவி நிலவரித் திட்ட அதிகாரி.

N. H. M. Suban

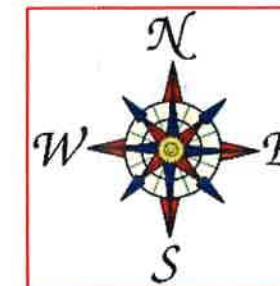
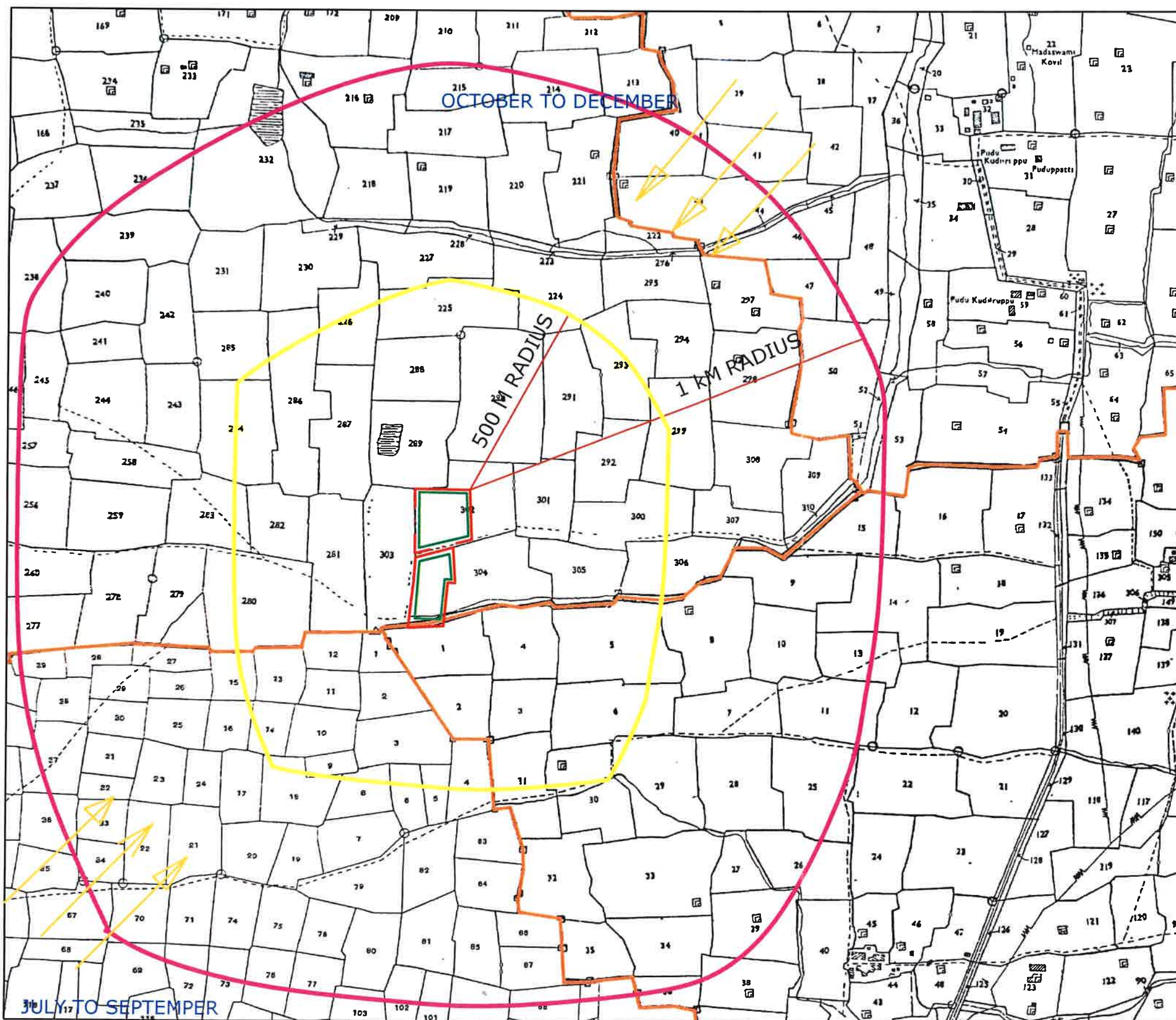
1429 ஆம் பசலியில் திருவாரூர் மாவட்டம் V.K. H. H. H.

நில வரித் திட்டத்தின்படி
புலன்களின் விபரம்.

முதல் போகம்.



நில வரித் திட்டத்தின்படி புலங்களின் விபரம்.					சாகுபடி யாளரின் பெயர்.		முதல் போகம்.		By Assistant Director (I/c) of Geology & Mining Tirunelveli Dist.			
நில அளவை எண்.	உட்பிரிவு எண்.	பரப்பு.	தீர்வை.	ஒரு போகம் அல்லது இரு போகம்.	கைப்பற்று தாரருடைய பெயரும் எண்ணும் அல்லது அனுபோக தாரருடைய பெயர்.	நிலத்தின் எந்த பகுதி யாவது சாகுபடியாளரால் பயிரிடப்பட்டுள்ளதா.	எந்த மாதத்தில் பயிர் செய்யப்பட்டது எந்த மாதத்தில் அறுவடை செய்யப்பட்டது.	பயிரின் பெயர்.	பயிரான / அறுவடையான பரப்பு.	உண்மையான பாய்ச்சல் ஆதாரம்.	விளைச்சல் அளவு விவரம்.	
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	
287	2A	01450040	1764	N.H.M. பாண்டியன்				செந்நீர்				
289	1B1	02025	0.20	1765	— do —			செந்நீர்				
289	3	02300	0.20	1402	— do —			செந்நீர்				
302	1	17050	1.55	876	— do —			செந்நீர்				
304	1A	05400	0.50	1412	— do —			செந்நீர்				
304	2A	07650	0.70	1412	— do —			செந்நீர்				
/ 9 க்கும் பக்கம் /												
திருவாரூர்												
கிராம நிர்வாக அலுவலர்												
4. ஆணைகளுக்கும் கிராமம்												
நிர்வாகனம்பதாரர் வட்டம்												



NAME OF THE APPLICANT:-

SHRI.N.H.M.PANDIAN,
S/O NAVANEETHAKRISHNA PANDIAN,
D.No.4/7,KURUNTHAN MOZHI,
KURUCHAMPATTI-POST,
VEERAKERALAMPUDUR-TALUK,
TENKASI- DISTRICT-627 860.

LOCATION OF THE APPLIED AREA:-

DISTRICT:TENKASI
TALUK : VERAKERALAMPUDUR
VILLAGE : ANAIKULAM
S.F.No. : 302/1,304/1A&304/2A
EXTENT : 3.01.00HECTARE

INDEX:-

APPLIED AREA	
SAFETY LINE	
1 km RADIUS	
500 M RADIUS	
CART TRACK	
WIND DIRECTION	
ODAI	
WELL	
VILLAGE BOUNDARY	

**VILLAGE MAP SHOWING
ENVIRONMENTAL FEATURES**

SCALE:-1:10,000

ALL PLANS AND SECTIONS ARE PREPARED BASED ON THE
LEASE MAP AUTHENTICATED BY STATE GOVERNMENT

T.S. GANESAN, M.Sc.,
RQP/MAS/142/2000/A

N.H.M. Pandian

ANNEXURE-VI MINING PLAN REPORT & PLATES

MINING PLAN



and PROGRESSIVE MINE CLOSURE PLAN ROUGH STONE and GRAVEL QUARRY

(PREPARED UNDER RULE 12 OF MINOR MINERAL CONSERVATION & DEVELOPMENT RULES, 2010 & AS PER AMENDMENT UNDER RULE No. 41 & 42 of TAMILNADU MINOR MINERAL CONCESSION RULES, 1959)

Mining Plan & Lease Period – Five (5) years

LOCATION OF THE QUARRY LEASE AREA

EXTENT	: 3.01.00 Hectares
SURVEY Nos.	: 302/1, 304/1A & 304/2A
VILLAGE	: ANAIKULAM
TALUK	: VEERAKERALAMPUDUR
DISTRICT	: TENKASI

Applicant

**Thiru.N.H.M.PANDIAN,
S/o.NAVANEETHAKRISHNA PANDIAN
D.No.4/7, KURUNTHAN MOZHI,
KURUCHAMPATTI Post,
VEERAKERLAMPUDUR TALUK,
TENKASI DISTRICT- 627 860.**

PREPARED BY

**T.S.GANESAN, M.Sc.,
QUALIFIED PERSON (RQP/MAS/142/2000/A)**

N.H.M. Pandian

Thiru.N.H.M.PANDIAN,
S/o.NAVANEETHAKRISHNA PANDIAN
D.No.4/7, KURUNTHAN MOZHI,
KURUCHAMPATTI Post,
VEERAKERLAMPUDUR TALUK,
TENKASI DISTRICT- 627 860.



CONSENT LETTER OF THE APPLICANT

I hereby give my consent to prepare the Mining Plan for the grant of Quarry Lease for quarrying Rough Stone & Gravel over a total extent of 3.01.00 Hectares in SF.Nos.: 302/1, 304/1A and 304/2A of Anaikulam Village, Veerakeralampudur Taluk, Tenkasi District for a period of Five years vide Joint Director / Assistant Director(i/c.), Geology & Mining, Tenkasi District letter Rc.No.M1/14953/2019 dated 18.05.2023 and submit for approval before the Competent Authority by

Mr. T.S.Ganesan, M.Sc.,
Qualified Person - RQP/MAS/142/2000/A.

I request the Assistant Director(i/c.), Geology and Mining, Thoothukudi to make further correspondence regarding the modification of the Mining Plan if any with said Qualified Person in the following address :

No. 11, Thiruvalluvar 1st Street,
Tirunelveli Town,
Tirunelveli Taluk & District - 627 006.
Cell : +91 99527 68494.
E-Mail: rampriya1965@gmail.com

I hereby undertake that all the modifications, if any, made in the Mining Plan by the Qualified Person may be deemed to have been made with my knowledge and consent and shall be acceptable by me and binding on me in all respect.

Place : V.K.Pudur
Date : 19-05-2023

N.H.M.Pandian
Signature of the Applicant.

Thiru.N.H.M.PANDIAN,
S/o.NAVANEETHAKRISHNA PANDIAN
D.No.4/7, KURUNTHAN MOZHI,
KURUCHAMPATTI Post,
VEERAKERLAMPUDUR TALUK,
TENKASI DISTRICT- 627 860.



DECLARATION OF THE APPLICANT

The Mining Plan in respect of the grant of quarry lease for quarrying of Rough Stone & Gravel over a total extent of 3.01.00 Hectares in SF.Nos.: 302/1, 304/1A and 304/2A of Anaikulam Village, Veerakeralampudur Taluk, Tenkasi District for a period of Five years has been prepared and submitted for approval in full consultation with me.

I understand its contents and agree to implement the same in accordance with Laws, Rules and Act applicable to quarry Rough Stone and Gravel.

Place : V.K.Pudur
Date : -05-2023

A handwritten signature in blue ink that reads "N.H.M. Pandian".

N.H.M.Pandian

Signature of the Applicant.

T.S.Ganesan, M.Sc.,
No. 11, Thiruvalluvar 1st Street,
Tirunelveli Town,
Tirunelveli Taluk & District - 627 006.
Cell : +91 99527 68494.
E-Mail: rampriya1965@gmail.com



CERTIFICATE FROM THE QUALIFIED PERSON

This is to certify that the provisions of the Mines Act, Rules and Regulations, Minor Mineral Conservation and Development Rules, 2010 & as per Amendment Rules under Tamil Nadu Minor Mineral Concession Rules, 1959 etc., made there under have been observed in the preparation of Mining Plan for Rough stone and Gravel quarry for Thiru.N.H.M.Pandian over an extent of 3.01.00 Hectares in SF.Nos.: 302/1, 304/1A and 304/2A of Anaikulam Village, Veerakeralampudur Taluk, Tenkasi District for a period of Five years.

Where ever the necessary permissions / exemptions / relaxations and approvals are required, the applicant would approach the concerned authorities of State and Central Governments for granting such permissions etc..

Place : Tirunelveli
Date : 27.05.2023


Qualified Person

T.S. GANESAN, M.Sc.,
RQP/MAS/142/2000/A





CERTIFICATE FROM THE QUALIFIED PERSON

This is to Certify that I, **T.S.Ganesan, M.Sc.(Applied Geology)**, having office at **No. 11, Thiruvalluvar 1st Street, Tirunelveli Town, Tirunelveli Taluk & District - 627 006**. I am a Post Graduate in Applied Geology from Bharadhidasan University, Tiruchirapalli.

Rule 15(I)(a) and (b) of Minerals (other than Atomic, Hydro Carbons Energy Minerals) Concession Rules 2016 stipulated the eligibility for preparing Mining plans as "(I)(a) a post graduate degree in Geology granted by a University established" and (I)(b) "Professional experience of five years of working in a supervisory capacity in the field of Mining after obtaining the degree". Since my qualification and experience are satisfied the Rule (I)(a) and (I)(b) of 15 of the said Rules, I am eligible to prepare Mining Plans for both Major and Minor minerals.

Accordingly, I prepared this Mining Plan for Rough stone and Gravel quarry for **Thiru.N.H.M.Pandian** over an extent of **3.01.00 Hectares** in **SF.Nos.: 302/1, 304/1A and 304/2A** of **Anaikulam Village, Veerakeralampudur Taluk, Tenkasi District**.

Place : Tirunelveli

Date : **27.05.2023**

T.S. Ganesan
Qualified Person

**T.S. GANESAN, M.Sc.,
RQP/MAS/142/2000/A**

N.H.M. Pandian



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2.0	LOCATION	5
PART – A		
3.0	GEOLOGY & MINERAL RESERVES	8
4.0	MINING	11
5.0	BLASTING	14
6.0	MINE DRAINAGE	16
7.0	OTHER PERMANENT STRUCTURES	16
8.0	EMPLOYMENT POTENTIAL & WELFARE MEASURES	18
PART – B		
9.0	ENVIRONMENT MANAGEMENT PLAN	19
10.0	MINE CLOSURE PLAN	23
11.0	ANY OTHER INFORMATION	25

N. H. M. Poolan



LIST OF ANNEXURES

S.NO	DESCRIPTION	ANNEXURE
1	Copy of Precise Area Communication letter	I
2	Copy of Aadhar & PAN cards - Id Proof of Applicant	II
3	Copy of FMBs	III
4	Copy of Patta, Adangal, A-Register & A1-Notice	IV
5	Copies of previous quarry Proceedings & Lease Deed	V
6	Copy of Qualified Person Certificates	VI

LIST OF PLATES

S.NO	DESCRIPTION	PLATE No.	SCALE
1	LOCATION PLAN	I	Not to Scale
2	ROUTE MAP	I A	Not to Scale
3	KEY PLAN	II	1 : 50,000
4	MINING LEASE PLAN	III	1 : 1,000
5	SURFACE & GEOLOGICAL PLAN & SECTIONS	IV	1 : 2,000 & 1 : 1,000
6	YEARWISE PRODUCTION PLAN & SECTIONS	V	1 : 2,000 & 1 : 1,000
7	CONCEPTUAL PLAN & SECTIONS	VI	1 : 2,000 & 1 : 1,000
8	ENVIRONMENTAL PLAN	VII	1 : 5,000
9	VILLAGE MAP SHOWING ENVIRONMENTAL FEATURES	VII A	1 : 10,000
10	LAND USE PATTERN	VII B	1 : 10,000
11	PROGRESSIVE MINE CLOSURE PLAN	VIII	1 : 2,000

N.H.M. Belian

MINING PLAN

and PROGRESSIVE MINE CLOSURE PLAN for ROUGH STONE & GRAVEL QUARRY

**OVER an EXTENT of 3.01.00 Hectares in
SF.Nos.302/1, 304/1A & 304/2A of ANAIKULAM VILLAGE,
VEERAKERALAMPUDUR TALUK, TENKASI DISTRICT, TAMIL NADU.**

(Prepared Under Rule 12 of Minor Mineral Conservation and Development Rules, 2010 and as per Amendment under Rule 41& 42 of Tamil Nadu Minor Mineral Concession Rules, 1959)

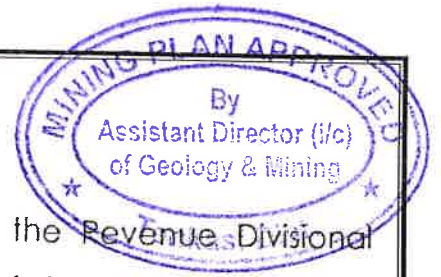
INTRODUCTION and EXECUTIVE SUMMARY :

This Mining Plan is prepared for Quarrying of Rough Stone and Gravel by systematic and scientific quarrying and to obtain Environment Clearance from State level Environmental Impact Assessment Authority (SEIAA), Chennai. The applicant **Thiru.N.H.M.Pandian** of Kurunthan Mozhi, Veerakeralampudur Taluk is an individual having skill on Rough Stone and Gravel Quarrying. The Rough Stone is mainly used for crushing blue metal stone aggregates of various sizes and M-Sand for concrete mixing for building, road, bridges, etc., and Gravel for filling purposes for road and buildings.

The applicant applied this area second time for quarrying & transportation of Rough Stone and Gravel over an extent of **3.01.00 Hectares** in SF. Nos.: **302/1, 304/1A & 304/2A** of Anaikulam Village, Veerakeralampudur Taluk, Tenkasi District under Rule 19 of Tamil Nadu Minor Mineral Concession Rules 1959 and the Joint Director / Assistant Director (i/c.), Geology & Mining Department, Tenkasi District communicated the precise area over an extent of **3.01.00 Hectares** in SF. Nos.: **302/1, 304/1A & 304/2A** of Anaikulam Village, Veerakeralampudur Taluk, Tenkasi District for the grant vide letter Rc.No.M1/14953/2019 dated 18.05.2023 for a period of 5 years under Rule 19 of Tamil Nadu Minor Mineral Concession Rules 1959 subject to the following conditions:

N.H.M.Pandian

T.S. Ganesan
T.S. GANESAN, M.Sc.,
RQP/MAS/142/2000/A



3. Based on the recommendations of the Revenue Divisional Officer, Tenkasi and the Assistant Geologist of Geology and Mining, Tenkasi the quarry lease application preferred by Thiru.N.H.M.Pandian to grant of quarry lease for quarrying and transportation of Roughstone and Gravel is considered to grant of quarry lease for a period of 5 years and precise area is hereby communicated over an extent of 3.01.0 hectares of patta land in SF. Nos. 302/1 (1.70.50), 304/1A (0.54.0) & 304/2A (0.76.50) of Anaikulam Village, V.K.Pudur Taluk, Tenkasi District under Rule 19 of the Tamil Nadu Mineral Concession Rule 1959 and communicated to the applicant as per the power conferred under amended Rule 41(4) Tamil Nadu Minor Mineral Concession Rules, 1959 subject to following condition.

- i. A safety distance of 7.5 meters should be provided to the adjoining patta land.
- ii. 10 meters safety distance should be left maintained to the Government Poramboke Thattaparai in SF. Nos. 303, Government Poramboke Cart track in SF. Nos. 302/4 & odai located on the southern side of the applied area.
- iii. No hindrance shall be caused to the adjoining pattadars' lands while carrying out quarrying operations.
- iv. Environmental Clearance should be obtained from the State Level Environment Impact Assessment Authority.

Hence, keeping all the conditions laid down by the departments, this Mining Plan is prepared under Rule 41(4) & 42 of Tamil Nadu Minor Mineral Concession Rules 1959 for approval in order to obtain the Environmental Clearance from SEIAA-Chennai.



Executive Summary :

i. Area Details :

District	Taluk	Village	Survey No.	Extent in Hects.	Remarks
Tenkasi	Veerakeralam Pudur	Anaikulam	302/1	1.70.50	Ryotwari Patta Nos.876 & 1412
			304/1A	0.54.00	
			304/2A	0.76.50	
			TOTAL	3.01.00	

ii. The Estimated Reserves are :

Geological available Resources in M ³		Production for 5 years in M ³	
Rough Stone	Gravel	Rough Stone	Gravel
14,02,830	1,03,341	3,03,165	65,397

- iii. Topography of the area = The area is plain terrain-194m above MSL
- iv. Existing Depth of the quarried pit = 2.0 max.
- v. Proposed Total Depth of mining = 49.0 (Below ground level)
- vi. Proposed period of mining = 5 years
- vii. It is a new/Existing quarry lease = Old quarry pits are available
- viii. Method of mining / level of mechanization = Opencast semi- mechanized method, the quarry operation involves shallow jack hammer drilling, slurry blasting.
- ix. Type of machineries proposed to be deployed in the quarrying operation.
Excavator of 0.90Cbm bucket capacity (with Rock breaker attachment)-2 Nos
Jack hammers 30-32mm dia.- 4 Nos.
- x. Tractor mounted compressor (2 jack hammer capacity)- 2 Nos.
- xi. No trees are uprooted due to quarrying operation.
- xii. The existing road from the main road to quarry is in good condition and the same will be maintained and utilized for transport.
- xiii. There is No Export of the Rough stone.
- xiv. The lease area is about 3.01.00 Hectares which is bounded by four corners and the Co — boundaries are clearly marked in the drawing enclosed as Plate No III.
- xv. The diagram of proposed mining area showing the dimensions of the pit, its proposed Depth of mining, proposed area is enclosed as Plate No V.
- xvi. There is no wastages anticipated during this quarry operation and the top soil will be

stacked along the boundary barrier and safety zones for afforestation purpose in the lease area.

xvii. Around 11 employees are proposed to be deployed for quarrying operation.

xviii. Environmental parameters,

- i) There is no interstate boundary around 10Kms radius.
- ii) There are no Wild Life Sanctuary located within 10.0 Km from the proposed lease area under the Wildlife (Protection) Act, 1972.
- iii) There is Uttumalai R.F at 9.0 Kms - East direction and there are no other Reserve Forests are situated within in 10.0 km of the area.

xix. **TOTAL COST OF THE PROJECT:**

A. Investment cost = Rs. 10,00,000/-

B. Mining cost = Rs. 1,18,68,000/-

Total Project Cost (A+B) = Rs. 1,28,68,000/-

xx. **EMP Cost = Rs. 15,10,000/-**

xxi. **CER Cost@2.0% over (A+B) = Rs. 5,00,000/-**
(allocation Rs.5.0 lacs)

1. GENERAL INFORMATION :

1.1	a)	Name of the applicant	Thiru. N.H.M.PANDIAN, S/o.Navaneethakrishna Pandian.
	b)	Address of the applicant (with phone No. & e-mail)	Address : D.No.4/7, Kurunthan Mozhi, Kuruchampatti Post, Veerakeralampudur Taluk. District : Tenkasi Pin Code : 627 860. Mobile No : 9786850032 Email id : pandian.rsg.quarry@gmail.com
	c)	Status of the applicant (Individual / Company / Firm)	Individual.
1.2	a)	Mineral which the applicant intends to mine	Rough Stone and Gravel.
	b)	Precise area communication letter details received from the Competent authority of the Government	Joint Director / Assistant Director(i/c.), Geology & Mining, Tenkasi District Precise area communication letter Rc.No. M1/14953/2019 dated 18.05.2023.



c)	Period of permission / lease to be granted	Period of lease to be granted for 5 years as per Rule 19 & 20 of Tamil Nadu Minor Mineral Concession Rules -1959
d)	Name and address of the RQP / Authorized person preparing the mining plan	Name : T.S.Ganesan M.Sc., Address : No. 11, Thiruvalluvar 1 st Street, Tirunelveli Town & Taluk, Tirunelveli District - 627 006. Cell : +91 99527 68494. E-Mail: rampriya1965@gmail.com Registration No : RQP/MAS/142/2000/A.

2. LOCATION :

2.1	a)	Details of the area with location map
		The proposed quarry area lies 3.0 Km east of Anaikulam village and 2.0 Km west of Kurichampatti village, 6.0 Km northeast of Surandai Town and has connectivity by panchayat roads from Surandai Town, also from State Highway (SH-39A) Pavoorchatram - Surandai- NH744 near Kadayannallur. There are no villages within the radius of 500m. The area bounded by following villages within 5 kms circle. - refer Plate-IA & Plate-II.

Table -1

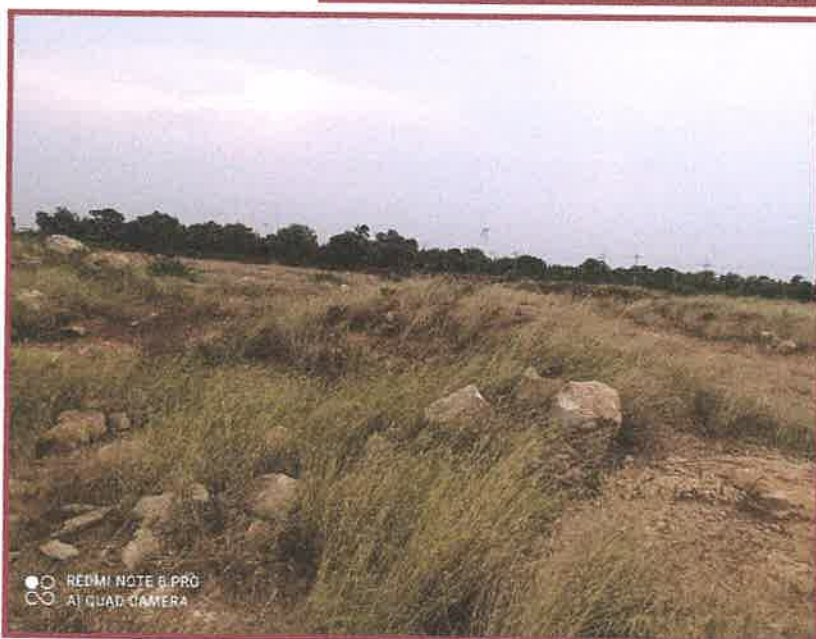
DIRECTION	VILLAGE	POPULATION	DISTANCE
North	Karaikandarkulam-H	650	3.0 Km
	Vellalamkulam	3,000	5.0 Km
NE	Kurundampuli-H	600	1.5 Km
	Karupenankulam	750	2.5 Km
	Uchchipottal	1,200	3.5 Km
	Mel-Kalingal & Kil-Kalingal	3,900	4.5 km
NW	Arunachalapuram	550	2.5 Km
	Pandiyapuram	1,500	3.5 Km
	Kadaiyaluritti	2,500	5.0 Km
South	Achchankuttam	4,000	4.5 Km
SE	Karaiyalankudiyiruppu-H	600	1.5 Km
	Iradamudayarkulam-H	750	3.5 Km
	Karuvanda	6,800	4.5 Km
SW	Vadiyur-H	800	3.0 Km
	Marudaipuram-H	750	4.0 Km
East	Kurichchampatti-H	1,000	2.0 Km
	Navaneethakrishnapuram	1,540	4.5 Km
West	Anaikulam	2,800	3.0 Km
	Kulayaneri-II	1,800	5.0 Km

N. H. M. Roshan



	i)	District, Taluk and Village	District : Tenkasi Taluk : VeerakeralamPudur Village : Anaikulam
	ii)	Survey Nos.	302/1(1.70.50Hc.), 304/1A(0.54.00Hc.) & 304/2A(0.76.50Hc.)
	iii)	Total Extent in Ha.	3.01.00 Hectares
2.2	b)	Classification of the area (Ryotwari/ Poramboke/ others)	Patta Lands (Ryotwari)
2.3	c)	Ownership / Occupancy of the applied area (surface right)	As per village accounts the land stands in the name of the applicant Thiru.N.H.M.Pandian S/o.Navaneethakrishna Pandian vide Patta Nos. 876 & 1412 of Anaikulam Revenue Village, Veerakeralam Pudur Taluk. As such the applicant has got surface rights over the lands applied for the grant of quarry lease.
2.4	d)	Topo sheet No. with latitude and longitude	Topo Sheet No. : 58 G/8. Latitude Between : 09° 00' 05.83" to 09° 00' 16.00" N Longitude Between : 77° 28' 32.52" to 77° 28' 37.57" E
2.5	e)	Existence of public road / Railway line, if any nearby and approximate distance:	The proposed quarry area lies 3.0 Km east of Anaikulam village and 2.0 Km west of Kurichampatti village, 6.0 Km northeast of Surandai Town and has connectivity by panchayat roads from Surandai Town, also from State Highway (SH-39A) Pavoorchatram - Surandai- NH744near Kadayanallur. The kutcha road from the quarry to main road is already in existence, the same road will be maintained & utilized for transportation. The nearest Rail head is at Kadayanallur Town at 13 kms distance towards northwest. The nearest Thoothukudi airport at 75 Km towards southeast & seaport at 85Km distances towards southeast.

SITE PHOTOS:



T.S. Ganesan
T.S. GANESAN, M.Sc.,
RQP/MAS/142/2000/A

7

N. H. Jayaraj

PART – A



3. GEOLOGY AND MINERAL RESERVES :

3.1	Brief description of the Topography and general Geology of the area (with plans) :								
	The area applied for quarry lease is plain terrain located 194m above sea level, with gentle slope towards south and covered by brownish red gravelly soil for 0.2m thick followed by gravel formation and massive Charnockite rock formation. The massive rock formation is noticed / occurred at an average depth of 4.0 mts from the surface i.e. below top soil, gravel and weathered rock formation. The top gravelly brownish red soil, gravel and weathered rock portion used for formation of Roads, filling the low lying areas, etc., The massive charnockite occur below the weathered zone is hard, medium to coarse grained with intrusions. The charnockite is played a vital role in construction and road formation civil works. Water table is found at a depth of 75m below ground level in this particular area. Average annual rainfall is about 820mm during SW and NE monsoons. Peninsular gneiss forms the oldest rock formations of Archean age, in which the massive formation of Charnockite lies over with rich accumulation of recent quaternary formation. On regional scale the Charnockite formations trends along NE-SW with a dip of 70° SE. The general geological sequences of the rocks in this area are given below. <table style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th style="text-align: center;">AGE</th><th style="text-align: center;">FORMATION</th></tr> </thead> <tbody> <tr> <td style="text-align: center;">Recent</td><td style="text-align: center;">- Quaternary weathered Rock Formation</td></tr> <tr> <td colspan="2" style="text-align: center;">.....Unconformity</td></tr> <tr> <td style="text-align: center;">Archean</td><td style="text-align: center;">- Charnockites Peninsular Gneiss complex.</td></tr> </tbody> </table>	AGE	FORMATION	Recent	- Quaternary weathered Rock Formation	Unconformity		Archean	- Charnockites Peninsular Gneiss complex.
AGE	FORMATION								
Recent	- Quaternary weathered Rock Formation								
.....Unconformity									
Archean	- Charnockites Peninsular Gneiss complex.								
3.2	<table border="1" style="width: 100%;"> <tr> <td style="width: 40%;">Details of exploration already carried out if any</td> <td>Exploration does not arise, since the massive Rough stone formation visible from the existing nearby quarry pits nearby the proposed site.</td> </tr> </table>	Details of exploration already carried out if any	Exploration does not arise, since the massive Rough stone formation visible from the existing nearby quarry pits nearby the proposed site.						
Details of exploration already carried out if any	Exploration does not arise, since the massive Rough stone formation visible from the existing nearby quarry pits nearby the proposed site.								
3.3	Estimation of reserves								
	a) Geological reserves with geological sections on a scale of 1:1000 / 1:2000:								

N. H. M. Reddy

The practical method of the systematic geological mapping and delineation of Rough stone (Charnockite) within the field was done and careful evaluation of body luster, physical properties, engineering properties, commercial aspects etc.,

Totally 1 section have been drawn along length wise as (A-A') and 3 sections along width wise as (B-B'), (C-C') & (D-D') to cover the maximum area considered. The Topographical, Geological plan and sections demarcated the commercial marketable Rough stone (Charnockite) deposit has been prepared in scale Plan - 1:2,000 & Sections - 1:1000 and the estimated available Geological Reserves after deducting existing pit already quarried as **14,02,830 CuM of Rough Stone and 1,03,341 CuM of Gravel.**

Please refer the Surface & Geological plan and sections Plate No- IV.

Geological Resources (Plate No. IV)

The geological reserves have been calculated based on the cross section method by deducting already excavated in the previous quarry workings and the availability of Geological Resources in this land is given below.

Table-1

SECTION	LENGTH (M)	WIDTH (M)	DEPTH (M)	ROUGH STONE VOLUME M ³	GRAVEL VOLUME M ³
A-A' & B-B'	136	130	4.0	-	70,720
	136	130	45.0	7,95,600	-
A-A' & C-C'	54	91	4.0	-	19,656
	54	91	45.0	2,21,130	-
A-A' & D-D'	110	78	4.0	-	34,320
	110	78	45.0	3,86,100	-
TOTAL GEOLOGICAL RESERVES				14,02,830	1,24,696
Less: Existing Pit Excavated Already				-	21,355
BALANCE GEOLOGICAL RESERVES				14,02,830	1,03,341

Table-1A

EXISTING PIT SIZE & QUANTITY

PIT	LENGTH (M)	WIDTH (M)	DEPTH (M)	GRAVEL VOLUME M ³
PIT-1	117	111	(0-1M) 1.0	12,987
PIT-2	54	12	(1-2M) 1.0	648
PIT-3	140	54	(0-1M) 1.0	7,560
PIT-4	16	10	(1-2M) 1.0	160
TOTAL EXCAVATED ALREADY				21,355



Available Mineable Reserves (Plate No. VI):

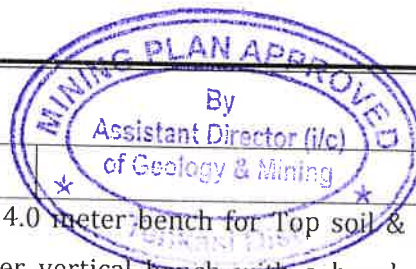
The available mineable reserves are calculated for the proposed lease period of 5 years based on the total minable reserves calculated by deducting 7.5m / 10.0m safety distances to the patta lands / govt. land / odai on along the boundary sides of the applied area, already excavated in the previous quarry workings and Bench losses.

Table-2

SECTION	LENGTH (M)	WIDTH (M)	HEIGHT (M)	ROUGH STONE VOLUME(M ³)	GRAVEL VOLUME(M ³)
A-A' & B-B'	117	111	4.0	-	51,948
	107	101	5.0	54,035	-
	97	91	5.0	44,135	-
	87	81	5.0	35,235	-
	77	71	5.0	27,335	-
	67	61	5.0	20,435	-
	57	51	5.0	14,535	-
	47	41	5.0	9,635	-
	37	31	5.0	5,735	-
	27	21	5.0	2,835	-
A-A' & C-C'	43	72	4.0	-	12,384
	38	62	5.0	11,780	-
	33	52	5.0	8,580	-
	28	42	5.0	5,880	-
	23	32	5.0	3,680	-
	18	22	5.0	1,980	-
A-A' & D-D'	95	59	4.0	-	22,420
	90	49	5.0	22,050	-
	85	39	5.0	16,575	-
	80	29	5.0	11,600	-
	75	19	5.0	7,125	-
TOTAL MINEABLE RESERVES				3,03,165	86,752
Less : Existing Pit- Already Excavated				-	21,355
BALANCE MINEABLE RESERVES				3,03,165	65,397

The available mineable reserves have been computed as **3,03,165 m³** of **Rough Stone** and **65,397 m³** of **Gravel** up-to the depth of **49.0** meters from the ground level.

4. MINING :



4.1	Method of mining (opencast / underground) :	
	Open cast Semi-Mechanized Mining with one 4.0 meter bench for Top soil & Gravel followed by charnockite rock 5.0 meter vertical bench with a bench width not less than the bench height. However, as far as the quarrying of Rough stone is concerned, observance of the provisions of Regulation 106 (2) (b) as above is seldom possible due to various inherent petro genetic factors coupled with mining difficulties. Hence, it is proposed to obtain relaxation to the provisions of the above regulation from the Director of Mines Safety for which necessary provision is available with the Regulation 106 (2) (b) of MMR-1961, under Mines Act - 1952.	
4.2	Mode of working (mechanized, semi mechanized, manual) :	
	The Rough Stone is proposed to quarry at 5m bench height & width with conventional Opencast Semi-Mechanized Method. The quarry operation involves shallow jack hammer drilling, slurry blasting, Loading and transportation of Rough stone and Gravel to the needy nearby crusher units / road formation works. The production of Rough stone in this quarry involves the following method which is typical for Rough Stone quarrying in contrast to other major mineral mining. Splitting of rock mass of considerable volume from the parent rock mass by jackhammer drilling and blasting, by manual/ excavator breakers FOR braking and loading the Rough Stone from pithead to the needy crushing units/ civil works for the needy sectors.	
4.3	Proposed bench height & width	Height 5.0m & Width 5.0m.
4.4	Indicate the overburden / mineral production expected pit wise as detailed below : (composite plan and section showing pit layout, dumps, disposal of waste if any etc.)	
	The overburden is in the form of top soil and weathered rock formation, it will be removed during the quarrying operation, the top soil preserved all along the boundary barrier for afforestation and remaining is salable. Hence there is no waste anticipated during the Rough stone quarry operation, The excavated rough stone will be directly loaded into the tippers to the end points. The Year wise and production Development plan and sections indicating the Pit lay out, Green belt development are shown in Plate-V and sections in Plate-V-A and presented in the Table-3 as follows.	

Year wise - Production Schedule - Table-3



SECTION	YEAR	LENGTH (M)	WIDTH (M)	HEIGHT (M)	ROUGH STONE VOLUME (M³)	GRAVEL VOLUME (M³)	
A-A' & B-B'	I-Year	58	111	4.0	-	25,752	
		48	101	5.0	24,240	-	
		38	91	5.0	17,290	-	
		28	81	5.0	11,340	-	
		18	71	5.0	6,390	-	
Less Gravel pit A-A' & B-B'		SUB-TOTAL			59,260	25,752	
		58	111	1.0	-	(-)6,438	
I - YEAR PRODUCTION					59,260	19,314	
A-A' & B-B'	II-Year	29	111	4.0	-	12,876	
		29	101	5.0	14,645	-	
		29	91	5.0	13,195	-	
		29	81	5.0	11,745	-	
		29	71	5.0	10,295	-	
		37	61	5.0	11,285	-	
Less Gravel pit A-A' & B-B'		SUB-TOTAL			61,165	12,876	
		29	111	1.0	-	(-)3,219	
II - YEAR PRODUCTION					61,165	9,657	
A-A' & B-B'	III-Year	30	111	4.0	-	13,320	
		30	101	5.0	15,150	-	
		30	91	5.0	13,650	-	
		30	81	5.0	12,150	-	
		30	71	5.0	10,650	-	
		30	61	5.0	9,150	-	
Less Gravel pit A-A' & B-B'		SUB-TOTAL			60,750	13,320	
		30	111	1.0	-	(-)3,330	
		54	12	1.0	-	(-)648	
III - YEAR PRODUCTION					60,750	9,342	
A-A' & C-C'	IV-YEAR	43	72	4.0	-	12,384	
		38	62	5.0	11,780	-	
		33	52	5.0	8,580	-	
A-A' & D-D'		95	59	4.0	-	22,420	
		90	49	5.0	22,050	-	
		85	39	5.0	16,575	-	
Less Gravel pit A-A' & C-C'			SUB-TOTAL			58,985	34,804
A-A' & D-D'			140	54	1.0	-	(-)7,560
			16	10	1.0	-	(-)160
IV - YEAR PRODUCTION					58,985	27,084	
A-A' & C-C'	V-YEAR	28	42	5.0	5,880	-	
		23	32	5.0	3,680	-	
		18	22	5.0	1,980	-	
A-A' & D-D'		80	29	5.0	11,600	-	
		75	19	5.0	7,125	-	
A-A' & B-B'		57	51	5.0	14,535	-	
		47	41	5.0	9,635	-	
		37	31	5.0	5,735	-	
		27	21	5.0	2,835	-	
V - YEAR PRODUCTION					63,005	-	
TOTAL PRODUCTION FOR FIVE YEARS					3,03,165	65,397	



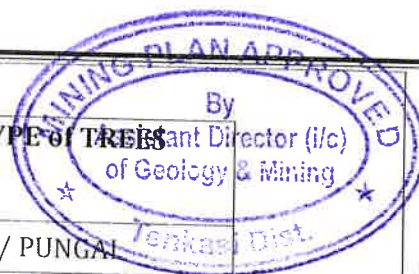
The applicant has proposed to carry out **3,03,165 m³** of Rough Stone and **65,397 m³** of Gravel production for the period of **FIVE** years up to a depth of **49 m** from the ground level (Table-3).

4.5	Machineries to be used																	
	a) For mining :																	
	Excavator of 0.90Cbm bucket capacity (with Rock breaker attachment) – 1 Nos. Jack hammers 30-32mm dia. – 4 sets. Tractor mounted compressor (2 jack hammer capacity) -2Nos.																	
	b) Loading equipment	Excavator of 0.90Cbm bucket capacity (with bucket attachment) – 1 No.																
	c) Transportation (includes within the mine and mine to destination)	Tipper 5 Nos. of 10/20 tons capacity (from quarry to needy peoples & local crushers).																
4.6	Disposal of overburden / waste																	
	The overburden is in the form of top soil and weathered rock formation. It will be quarried for filling purposes to nearby end users and part of soil will be preserved all along the boundary as barrier for afforestation.																	
4.7	Brief note on conceptual mining plan for the entire lease period base on the geological, mining and environmental considerations:																	
	Conceptual mining plan is prepared with an object of long term systematic development of benches, layouts, selection of permanent structures, depth of quarrying and ultimate pit dimensions, selection of sites for construction of infrastructure, etc., The ultimate pit size is designed based on certain practical parameters such as economical depth of mining, safety zones, permissible area, etc., The ultimate pit limit (dimension) at the end of five years mining lease period is given below: Table-4 <table><tr><th>Description End of the lease period</th><th>Length (Max) (m)</th><th>Width (Max) (m)</th><th>Depth (Max) (m)</th></tr><tr><td>A-A' & B-B'</td><td>117</td><td>111</td><td>49.0</td></tr><tr><td>A-A' & C-C'</td><td>72</td><td>43</td><td>29.0</td></tr><tr><td>A-A' & D-D'</td><td>95</td><td>59</td><td>24.0</td></tr></table> Afforestation has been proposed in the 7.5m safety barrier by planting 750 nos. as said below:		Description End of the lease period	Length (Max) (m)	Width (Max) (m)	Depth (Max) (m)	A-A' & B-B'	117	111	49.0	A-A' & C-C'	72	43	29.0	A-A' & D-D'	95	59	24.0
Description End of the lease period	Length (Max) (m)	Width (Max) (m)	Depth (Max) (m)															
A-A' & B-B'	117	111	49.0															
A-A' & C-C'	72	43	29.0															
A-A' & D-D'	95	59	24.0															

N. H. M. R. S. R. S.

Table-4A

YEAR	No. of TREES	TYPE OF TREES
I - Year	300	NEEM / PUNGAI
II - Year	300	NEEM / VAGAI
III - Year	300	NEEM / PUVARASU
IV - Year	300	NEEM / SUVUKKU
V - Year	300	NEEM / PUNGAI



of native species during the five years period. All the base line information studies like Air quality monitoring, Noise and vibration monitoring, Water analysis studies will be carried out as per the MOEF Norms.

Please refer plate No. V & VI.

5. BLASTING :

5.1 Blasting pattern

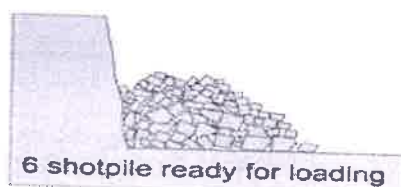
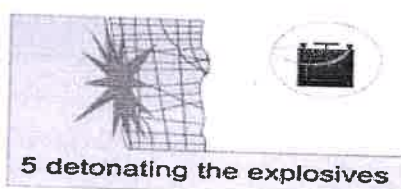
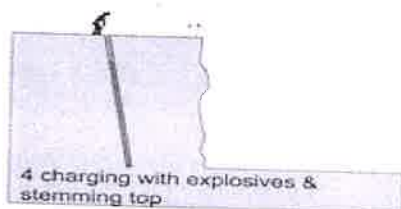
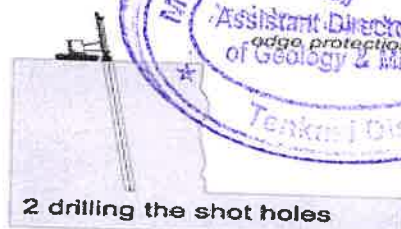
The quarrying operation will be carried out in conjunction with conventional method of mining using Jack hammer drilling and blasting for shattering effect and loosen the Rough stone.

Drilling and Blasting :

Drilling and blasting parameters are as follows:

Diameter of the hole	:	32-36 mm
Spacing	:	0.5m
Depth	:	1.2m to 1.5m
Burden per hole	:	0.5m
Pattern of hole	:	Zig Zag Staggered in 2 to 3 rows
Inclination of holes	:	80° from the horizontal.
Use of delay detonators	:	25 milli-second delays
Detonating fuse	:	NONEL "Detonating" Cord

ROCK BLASTING



5.2 Type of explosives to be used

Small Dia. 25mm Slurry explosives are proposed to be used for shattering and heaving effect for removal and winning of Rough stone. No deep hole drilling or primary blasting is proposed.

5.3 Measures proposed to minimize ground vibration due to blasting

Controlled blasting measures will be adopted for minimizing ground vibration and fly of rock by NONEL initiation based controlled blasting. Shallow depths jackhammer drilling & blasting is proposed to be carried out with minimum use of explosive mainly to give shattering effect in rough stone for easy excavation and to control fly of rock.

Number of holes	:	Total- 95 holes in 2 batches
Powder factor	:	6 Ts/Kg of explosives
Total explosive required	:	15 Kg slurry explosives
Charge / hole	:	0.5Kg
Blasting time	:	12.00-2.00 PM / 4.30-5.30 PM

5.4 Storage and safety measures to be taken while blasting

The lessee will engage an authorized explosive agency to carry out the small amount of blasting and it will be supervised by competent and statutory Foreman/Permit Mines Manager.

6. MINE DRAINAGE :

6.1	Depth of water table (based on nearby wells and water bodies)
	The water table is below 65 mts from ground level which is observed from the nearby bore wells and the data obtained from existing panchayat and Private borewells. The quarry operation is proposed up to a depth of 49.0mts below the ground level.
6.2	Arrangements and places where the mine water is finally proposed to be discharged
	The water encountered during quarrying inside the pit due to rain water and seepage, will be pumped out by 5HP water pumps to the Green belt development areas and excess water to the down side village water tanks (Kanmoi/Urani) through a de-silting trap pit for use of agricultural purposes. Also the water will be used for dust suppression on haul roads during Haulage of machineries.

7. OTHER PERMANENT STRUCTURES (also shown in the map) :

7.1	Habitations / village natham :
	There are no habitations within the Radius of 500m. The nearby village habitations are tabulated in Table - 5 as below.
7.2	Power lines (HT/ LT):
	There are no Electric Power line within 50 mts distance from the lease area.
7.3	Water bodies (river, pond, lake, odai, canal etc.,)
	The nearest water body is Urani (Pond) at 150m northwest. The nearest odai begins at southern side drains rain water from west to east and a safety distance of 10.0m will be maintained apart from odai for 5.0m width. There are no major water bodies like river, lake, etc., within 50m radial distance.
7.4	Archaeological / historical monuments
	There are no Archaeological / historical monuments within 500m radial distance from the area.
7.5	Road (NH, SH others)
	The State High Way SH-39A, Pavoorchatram - Surandai - NH-744 south of Kadayanallur is at 6.5 kms southwest. There is a panchayat road up to the SH-39A from the village and the proposed area shall be reachable through a cart track from village.

7.6	Places of worship
	There are no place of worships within the Radius of 500m
7.7	Reserved forest / forest / social forest / wild life sanctuary etc.
	- There are no Wild Life Sanctuary located within 10.0 Km from the proposed lease area under the Wildlife (Protection) Act, 1972. - There is Uttumalai R.F at 9.0 Kms - E direction and there are no other Reserve Forests are situated within in 10.0 km of the area.

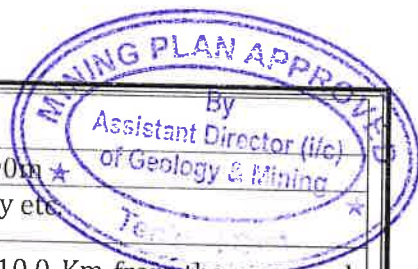


Table-5

SL. NO	DIRECTION	VILLAGE	POPULATION	DISTANCE
1	North	Karaikandarkulam-H Vellalamkulam	650 3,000	3.0 Km 5.0 Km
2	NE	Kurundampuli-H Karupenankulam Uchchipottal Mel-Kalingal & Kil-Kalingal	600 750 1,200 3,900	1.5 Km 2.5 Km 3.5 Km 4.5 km
3	NW	Arunachalapuram Pandiyapuram Kadaiyaluritti	550 1,500 2,500	2.5 Km 3.5 Km 5.0 Km
4	South	Achchankuttam	4,000	4.5 Km
5	SE	Karaiyalankudiyiruppu-H Iradamudayarkulam-H Karuvanda	600 750 6,800	1.5 Km 3.5 Km 4.5 Km
6	SW	Vadiyur-H Marudaipuram-H	800 750	3.0 Km 4.0 Km
7	East	Kurichchampatti-H Navaneethakrishnapuram	1,000 1,540	2.0 Km 4.5 Km
8	West	Anaikulam Kulayaneri-H	2,800 1,800	3.0 Km 5.0 Km

Table- 6

Nearest Infrastructures :

Sl. No	Name of infrastructure	Name of village	Distance from area applied for M.L
1	Post office	Surandai B.O Pin:627859	6.0 Km
2	Police station	Surandai Police Station	6.0 Km
3	Town	Surandai	6.0 Km
4	Panchayat	Anaikulam	3.0 Km
5	Union	Kadaiyanallur Block	13.0 Km
6	DSP office	Thoothukudi	10.0 Km
7	Hospital	Kulaiyaneri GH /Private Hos.	5.0 Km

N.H.M. Subramanian

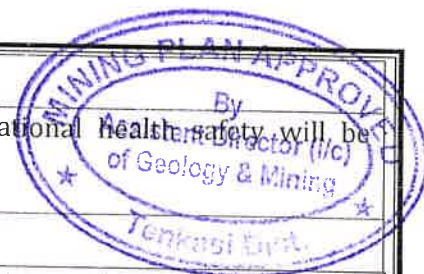
8	School	Govt. Higher Sec. School, Anaikulam	3.0 Km
9	Railway station	Kadaiyanallur	13.0 Km
10	Airport	Thoothukudi	75.0 Km
11	Sea Port	Thoothukudi	85.0 Km



8. EMPLOYMENT POTENTIAL & WELFARE MEASURES :

8.1	Employment potential (skilled, semi skilled, unskilled)		
	a.	Skilled labour	
		Mines Manager	: 1
		Mine Foreman	: 1
		Jack hammer operator	: 2
		Blaster/ mate	: 1
	b.	Unskilled- helpers	: 6
		Total	11
	The above manpower is adequate to meet out the production schedule and the machinery strength envisaged in the mining plan and to comply with the statutory provisions of the Mines Safety Regulations. It is been ensured that no labour employed less than 18 years (child labours) or entertained for any kind of quarrying operations. All the labours engaged for quarrying operations will be insured during the quarry lease period.		
8.2	Welfare measures		
	a) Drinking water/other water requirements:		
		Drinking & Domestic water	- 1.0 KLD
		Dust suppression sprinkling	- 3.5 KLD
		Afforestation for trees	- 1.5 KLD
		TOTAL WATER REQUIRED	- 6.0 KLD
	Requirement will be arranged from nearby sources		
	b) Sanitary facilities		
	Sanitary facilities will be constructed with in the quarry lease area as permanent structure and it will be maintained periodically.		
	c) First Aid facility		
	First aid kits will be kept in Mines office room, in case of such eventualities, the victim will be given first aid immediately at the site and injured person will be taken to the hospital. Hospitals are available at distance of 5.0 Km in Kulaiyaneri GH & in 6.5 km at Surandai GH / private hospitals. The competent and Statutory Foreman/Permit Manager will be in charge of first aid.		

d) Labor Health	Periodically medical checkup related to occupational health safety will be conducted to all the workers.
e)Precautionary safety measures to the laborers	All the quarry workers will be provided with safety equipments like helmets, Mine Goggles, Ear plugs, Ear muffs, Dust mask, reflector jackets and Safety Shoes as personal protective device as per the specification approved by Director of Mines Safety. Periodically medical checkup will be conducted for all workers for any mine health related problems. Proper training and induction will be given by qualified and experienced safety officer to all employees about the safe and systematic Rough stone quarrying operations. The drillers and workers will be sent for vocational training periodically to carry out the quarrying operations scientifically to safe guard the men machinery and mineral and to create awareness of conventional opencast quarrying operations.



PART – B

9. ENVIRONMENT MANAGEMENT PLAN :

9.1	Existing land use pattern:														
	The lease area is plain terrain with very gently sloping towards southeast. The proposed lease area is dry barren lands and occasionally covered by thorny bushes. Because of rocky exposures and hard surface the area is mostly dry and barren. The dry crop agricultural activities are noticed within 1 km scattered manner and considerable area mostly dry . Land use pattern within 1.0 Km radius is follows: <table style="margin-left: 40px;"> <tr> <td>1. Proposed & present Quarry Area</td><td>- 7%</td></tr> <tr> <td>2. Crushers Industries</td><td>- 2%</td></tr> <tr> <td>3. Roads & cart tracks</td><td>- 7%</td></tr> <tr> <td>4. Green Belt & Fairly dense scrubs</td><td>- 4%</td></tr> <tr> <td>5. Water bodies odai,urani& Kanmoi</td><td>- 8%</td></tr> <tr> <td>6. Dry Lands & other industries</td><td>- 38%</td></tr> <tr> <td>7. Seasonal Agricultural lands</td><td>- 34%</td></tr> </table> There are 2 old quarry pits of stone quarries in the west and southwest. The land use pattern within the proposed lease area in the beginning of the lease period:	1. Proposed & present Quarry Area	- 7%	2. Crushers Industries	- 2%	3. Roads & cart tracks	- 7%	4. Green Belt & Fairly dense scrubs	- 4%	5. Water bodies odai,urani& Kanmoi	- 8%	6. Dry Lands & other industries	- 38%	7. Seasonal Agricultural lands	- 34%
1. Proposed & present Quarry Area	- 7%														
2. Crushers Industries	- 2%														
3. Roads & cart tracks	- 7%														
4. Green Belt & Fairly dense scrubs	- 4%														
5. Water bodies odai,urani& Kanmoi	- 8%														
6. Dry Lands & other industries	- 38%														
7. Seasonal Agricultural lands	- 34%														

	Mining / Excavation at present - 0.00.00 Hectares Storage of top soil& weathered rock - 0.00.00 " Stocking & Mineral Dressing Yard - 0.00.00 " Infrastructure - 0.01.00 " Mine Road - 0.03.00 " Afforestation & Mine safety - 0.82.30 " Future Mining - 2.14.70 " Undisturbed area - 0.00.00 " Total 3.01.00 " ===== Details furnished in the Plate Nos. VIIA, VIIB & VIII.
9.2	Water regime
	Ground water table in this area is below 65 mts from ground level. The quarrying is up to a maximum depth of 49m below the ground level. Hence the quarry operation will not be affected by the ground water. There are 11 agricultural open wells within 1 km distance, mostly dry and during or after rainy seasons the water level ranges between 4 to 5mts. The panchayat borewells near the villages found the water level at 65mts below ground level.
9.3	Flora and fauna
	Except grass, acacia bushes, no other valuable trees are noticed in the applied area. Further, neither flora of botanical interest nor fauna of zoological interest is noticed in this area.
9.4	Climatic conditions
	The area receives annual rainfall of about 820mm and the rainy season is mainly from Oct. – Dec. during North East monsoon. The summer is hot with maximum temperature of 42°C and winter encounters a minimum temperature of 23°C.
9.5	Human settlement
	There are few villages located in this area within 5km radius, the approximate distance and population are given in Table -5 as above. Basic human welfare Amenities such as Health Center, Schools, Communication Facilities, and Commercial Centers etc are available at 5.0 Km in Kulaiyaneri GH & at 6.5 km in Surandai GH / private hospitals from the mining proposed area.
9.6	Plan for air, dust suppression





	The Air quality will be affected during the quarrying period due to blasting and jack hammer drilling, which will be within prescribed limits. Mist Water spraying will be carried out to suppress the dust in day time often as and when required.
9.7	Plan for noise level control
	Shallow holes of 32mm diameter and 1.5 feet depth will be drilled and conventional low power explosives such as Slurry Explosives, ordinary safety fuse only will be used for rough stone. Hence, ground vibration and noise pollution will be minimal and restricted within the quarry workings. Noise level monitoring and other Mitigation measures will be carried out to reduce Noise and Vibration. The drivers will be strictly instructed to move the vehicle during the transportation not exceeding 40 km per hour. Sentries with flags & whistle will be posted in village junction and regulate traffic.
9.8	Environmental impact assessment statement describing impact of mining on the next five years
	The mining plan is for production of Rough stone involving deep hole drilling and heavy blasting. The mining activity will be carefully carried without causing any impact adversely on environment as far as pollution of air, water and noise is concerned. Anyhow periodical quarterly environmental impact studies will be conducted as per EIA notification issued by MOEF.
9.9	Proposal for waste management
	The Air quality will be affected during the quarrying period due to blasting and jack hammer drilling, which will be controlled by spraying Mist Water to suppress dust.
9.10	Proposal for reclamation of land affected during mining activities and at the end of mining (refilling / fencing etc.)
	The project proposed area will be fenced with stone pillars with 3mts interval and covered barbed wires with only one entry point for transport. There is no refilling is planned since all the quarried rough stone and gravel is salable and the pit after quarry completion will be filled with rain water from the nearby sources which will act as recharge body for ground water for the influence of the surrounding agricultural wells for agricultural purposes.
9.11	Program of afforestation (indicate extend, number, name of species to be afforested)

II. EMP Cost :

Sl. No.	DETAILS	COST per MONTH (Rs.)	Total Cost per Year (Rs.)	TOTAL COST for 5 years LEASE & Mining PERIOD (Rs.)
i)	Drinking Water facility for 11 Laborers from water vendors	2000	24,000	1,20,000
ii)	Sanitary maintenance for Rest rooms	2000	24,000	1,20,000
iii)	Safety kits(mask, helmet, sanitizer, gloves, etc.,)	1000	12,000	60,000
iv)	Water Sprinkling using own tractor for the area	10,000	1,20,000	6,00,000
v)	Afforestation, Plantation & Maintenance	50,000 (annual)	50,000	2,50,000
vi)	Environmental parameters testing expenses fees for every six months	(bi-annual)		3,60,000
	a. Air Monitoring	25,000	50,000	
	b. Water analysis	5,000	10,000	
	c. Noise Monitoring	3,000	6,000	
	d. Soil Testing	3,000	6,000	
TOTAL				15,10,000

III. CER cost @2% on Project cost (a+b) - Rs. 5,00,000/-

CER Activity	CER cost (Rs)
Carrying out provisions for Drinking Water with dispenser and Toilet /sanitary repair for students in Govt. Higher Secondary School, Anaikulam Village, Veerakeralampudur Taluk and Tenkasi District.	2,50,000/-
Revised Cost Allocation	5,00,000/-

10. MINE CLOSURE PLAN :

10.1	Steps proposed for phased restoration, reclamation of already mined out areas
	There is no proposal for back filling, reclamation and rehabilitation. The quarried pits after the end of the life of lease will be fenced to prevent inherent entry of public and cattle's and will be used for Rain Water harvesting.
10.2	Measures to be under taken on mine closure as per Act & Rules
	Measure will be taken as per Act & Rules, there is no proposal for back filling, reclamation and rehabilitation. The quarry pit will be fenced by barbed wire to prevent inherent entry of public and cattle. The quarried out pit will be allowed to collect rain water which will act as a reservoir for storage and recharge pit for ground water which will enhance the static water level of nearby wells.

10.3	MITIGATION MEASURE TO BE UNDERTAKEN FOR SAFETY AND RESTORATION / RECLAMATION OF THE ALREADY MINED OUT AREA.
	AIR QUALITY: Air quality will be degrade due to the drilling, blasting, mining operation and transportation.
	Mitigation measures: Drilling will be carried out by wet drilling mode to control the dust propagation into the air. Controlled Blasting will be carried out on limited scale. Mist Water spraying on haul road is proposed to prevent the dust propagation into the air.
	NOISE AND VIBRATION: The noise will be formed due to the drilling, blasting, loading and movement of Machineries.
	The applicant has proposed to carry out the plantation all along the boundary to prevent Noise besides wet drilling will be practiced to prevent dust. All the machineries will be maintained in good conditions as per RTO and TNPCB Norms to prevent Noise, Smoke and vibration to maintain noise levels below 80dB.
	WATER REGIME :
	The quarry operation (49.0m depth below Ground level) is well above the water table (below 65 mts from ground level), hence the water table will not be affected in any manner. The seepage and rain water will be drained out from the pit by 5H.P motor pump and will be discharged through a silt trap / filter media to boundary barrier for afforestation and excess water will be sprayed on haul roads to prevent dust propagation in to the atmosphere. The rough stone quarry will not produce any harmful toxic effluence in the form of solid, liquid or gas.
	HUMAN HEALTH & SAFETY: Dust will be limited due to the mine operation.
	All the laborers will be provided with safety equipment's like helmet, Safety Goggles, Ear muff, Hand gloves, safety jacket, safety belt, and Mine boots etc., at applicant's cost, as per the specifications of Director of mines safety. The competent qualified person foreman/Permit Mines Manager will provide first aid and will take care of small & minor injuries. If any accident happens, the victim will be taken to the nearby hospital by the applicants van which is always kept in the mines office. Hospitals are available at 5.0 Km in Kulaiyaneri GH & in 6.5 km at Surandai GH / private hospitals.



11. ANY OTHER DETAILS INTEND TO FURNISH BY THE APPLICANT

- ❖ This mining plan for Rough stone (Charnockite) quarry is prepared as per the Minor Mineral Conservation and Development Rules, 2010 and amendments in the Tamil Nadu Minor Mineral Concession Rules, 1959.
- ❖ The provisions of the Mines Act, Rules and Regulations and orders made there under shall be complied with, so that the safety of the mine, machinery and person will be well protected.
- ❖ Permission, relaxation or exemption wherever required for the safe and scientific quarrying of the deposit will be obtained from the Department of Mines Safety.
- ❖ Any violation pointed out by the inspecting authorities shall be rectified as per the guidelines of the Department.

Place : Tirunelveli
Date : 27.05.2023

T.S. Ganesan
RQP SIGNATURE
T.S. GANESAN, M.Sc.,
RQP/MAS/142/2000/A

This Mining Plan is approved Subject to the
Conditions / Stipulation Indicated in the Mining
Plan Approval

Letter Roc.No. M1/14953/2019

Dated . 21.06.2023

h
Regional Joint Director /
Assistant Director (I/C)
Geology and Mining
Tenkasi

Ray
21/6/23

N.H.M. Panicker

From

Thiru.L.Suresh.,
Joint Director/
Assistant Director (i/c),
Geology and Mining,
Tenkasi.

To

Thiru.N.H.M.Pandian,
S/o.Navaneethakrishna Pandian,
4/7, Kurunthan Mozhi,
Kuruchampatti Post,
V.K.Pudur Taluk,
Tenkasi District.



Rc.No.M1/14953/2019

Dated.18.05.2023

Sir,

Sub: Mines and Quarries - Minor Minerals - Tenkasi District - Quarry lease application preferred by Thiru.N.H.M.Pandian for quarrying and transportation of Roughstone and Gravel - over an extent of 3.01.0 hectares of patta land in SF. Nos. 302/1, 304/1A & 304/2A of Anaikulam Village, V.K.Pudur Taluk - Precise area communicated - Approved Mining Plan - Called for - Reg.

Ref:

1. Quarry lease application preferred by Thiru.N.H.M.Pandian, Kuruchampatti, V.K.Pudur Taluk, dated. 24.04.2019.
2. The Revenue Divisional Officer, Tenkasi Letter No.A3/2173/2019, dated. 10.03.2020.
3. Inspection report of the Assistant Geologist, Geology and Mining, Tenkasi, dated. 22.03.2023.

Thiru.N.H.M.Pandian, S/o.Navaneethakrishna Pandian, 4/7, Kurunthan Mozhi, Kuruchampatti Post, V.K.Pudur Taluk, Tenkasi District has applied for grant of quarry lease for quarrying Roughstone and Gravel over an extent of 3.88.75 hectares of patta land in SF. Nos. 287/2 (0.44.5), 289/1B (0.20.5), 289/3 (0.23.0), 302/1 (1.70.5), 304/1A (0.54.0) & 304/2A (0.76.5) of Anaikulam Village, V.K.Pudur Taluk, Tenkasi District for a period of 5 years under Rule 19 (1) of Tamil Nadu Minor Mineral Concession Rules, 1959.

N.H.M. Pandian



period of 90 days from the date of receipt of this notice as required under rule 41 (5) of Tamil Nadu Minor Mineral Concession Rules, 1959.

5. You are further directed to produce Approved Mining Plan and Environmental Clearance obtained from the State Level Impact Assessment Authority (SEIAA) as required under Rule 42 of Tamil Nadu Minor Mineral Concession Rules, 1959 for grant of quarry lease for quarrying Roughstone and Gravel in respect of the precise area communicated.


Joint Director/
Assistant Director(i/c),
Geology and Mining,
Tenkasi.


18/5/23

N. H. M. R. R. R.



भारत सरकार

GOVT. OF INDIA



என் எச் எம் பாண்டியன்

N H M Pandian

பிறந்த நாள் / DOB : 10/12/1967

ஆண் / MALE



2841 7387 7483

ஆதார் - சாதாரண மனிதனின் அதிகாரம்



भारतीय विशिष्ट पहचान प्राधिकरण
UNIQUE IDENTIFICATION AUTHORITY OF INDIA

முகவரி:

தந்தை / தாய் பெயர்:

தவந்திசுப்பாண்டியன்,

2/48, வேதக் கோவில் தெரு.

குறிச்சாம்பட்டி,

திருநெல்வேலி, தமிழ் நாடு.

627860

Address:

S/O:

Navaneethakrishnapandian,

2/48, VEDHA KOVIL STREET,

KURICHAMPATTI,

Kurichampatti, Tirunelveli, Tamil

Nadu, 627860



1800 300 1947



help@uidai.gov.in



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P.O. Box No. 1947,
Bengaluru-560 001

आयकर विभाग
INCOME TAX DEPARTMENT

भारत सरकार
GOVT. OF INDIA

N H M PANDIAN

K M N KRISHNAN

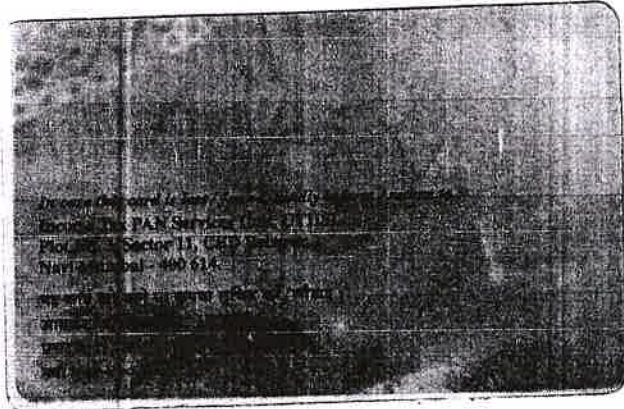
10/12/1967

PAN Card Number

AKJPP8855D

Signature

Signature



T.S. GANESAN, M.Sc.,
RQP/MAS/142/2000/A

N. H. M. Pandian

District : Tenkasi

Taluk : Veerakeralampudur

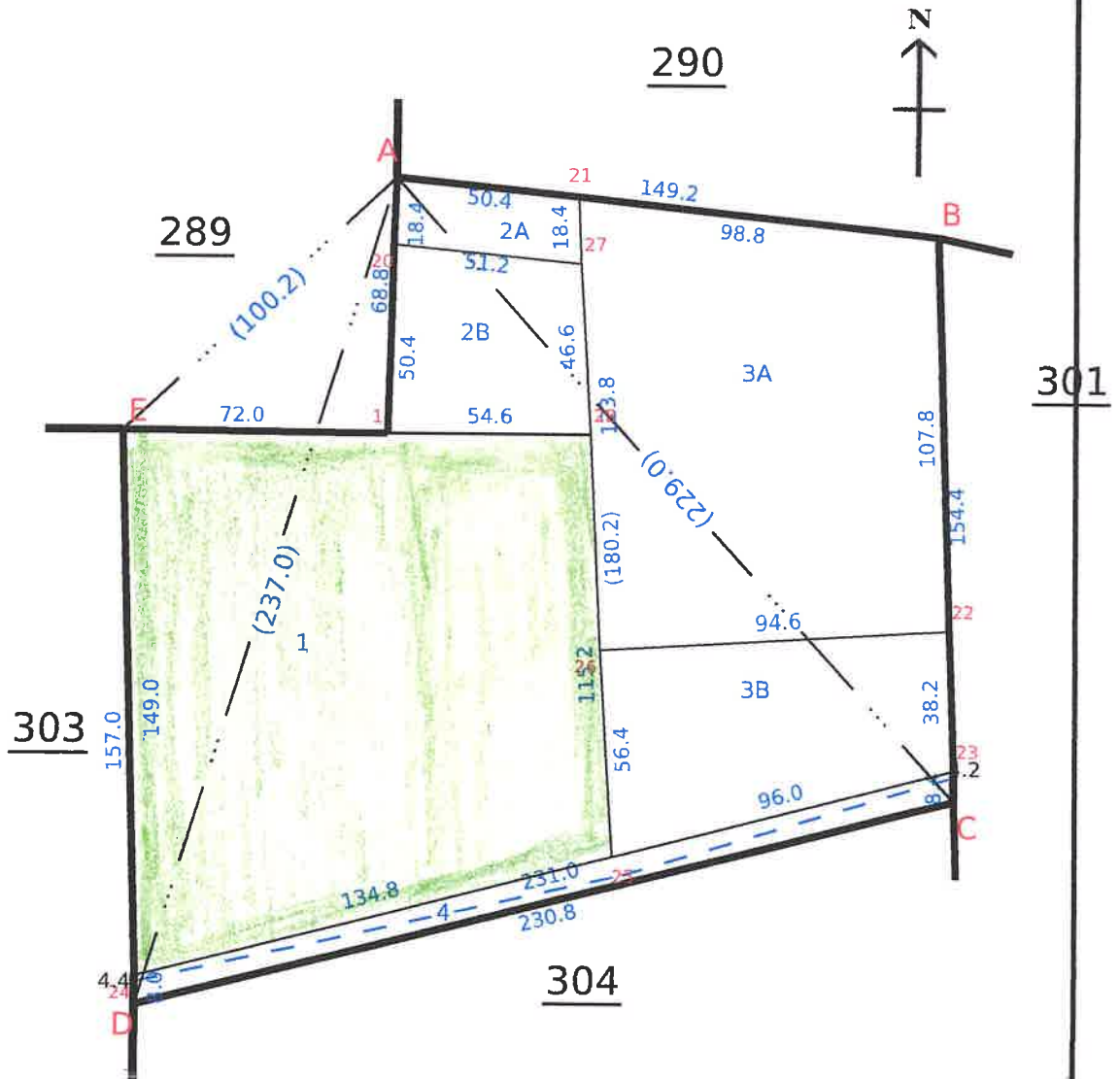
Village : Anaikulam [4]



Survey No : 302

Area : Hect 03 Ares 85.50

Scale : 1 : 2000



T.S. Ganesan
T.S. GANESAN, M.Sc.,
RQP/MAS/142/2000/A

N.H.M. Pachan

Date of Issue: 19-05-2023 16:19:56

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District : Tenkasi

Taluk : Veerakeralampudur

Village : Anaikulam

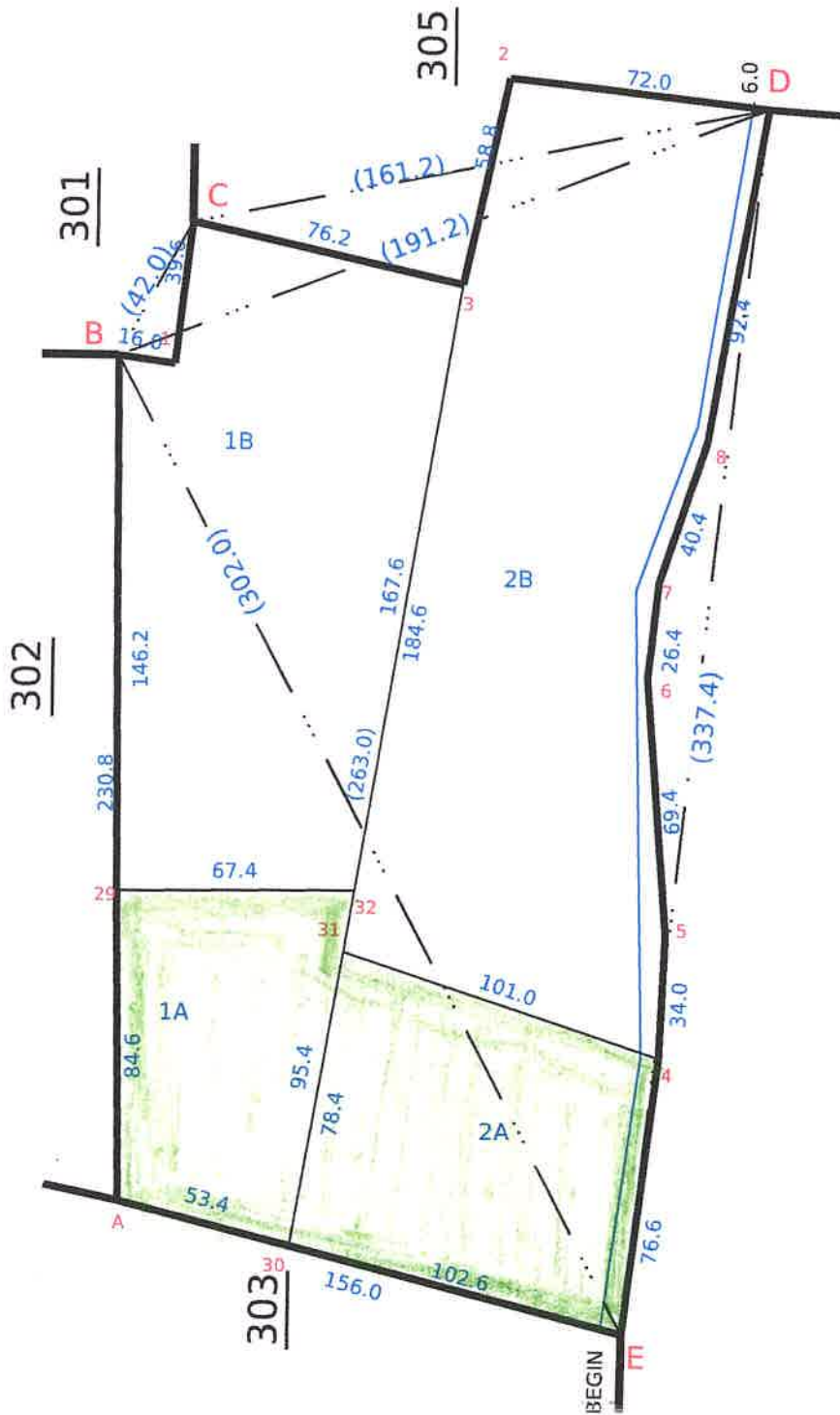
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Survey No : 304

Area : Hect 04 Ares 78.00

Scale : 1 : 2000



V.NO.8.KURICHAM PATTI

T.S. Ganesan
T.S. GANESAN, M.Sc.,
RQP/MAS/142/2000/A

N.H.M. Pothan

Date of Issue: 24-05-2023 23:18:44

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பெயர் : (10)கிராமம்

பெயர் : கிராமம்

பெயர் : 302



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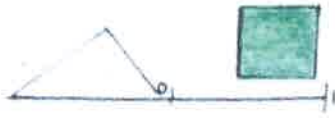
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N.H.M. Sankar



20.4 / 10, 20 / 1000



கருணாநிதி 68 (1968)

அளவு. 1. 2000 கி.கி

26 Jan 1944

Teak Deputy Inspector of Survey,
Voerakeralamoudur.

288



தமிழக அரசு

வருவாய்த் துறை

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

மாவட்டம் : திருநெல்வேலி

வட்டம் : வீ. கே. புதூர்

வருவாய் கிராமம் : ஆனைகுளம்

பட்டர் எண் : 876



உரிமையாளர்கள் பெயர்

1. நவந்திகிருஷ்ணபாண்டியன் மகன் என்.ஹெச்.எம்.பாண்டியன்



நன்செய்		புன்செய்		மற்றவை	
பரப்பு	தீர்வை	பரப்பு	தீர்வை	பரப்பு	தீர்வை
புல எண்	உட்பிரிவு	ஹெக் - ஏர்	ரூ - பை	ஹெக் - ஏர்	ரூ - பை
302	1	--	--	1 - 70.50	1.55
				1 - 70.50	1.55

குறிப்பு 2 :



1. மேற்கண்ட தகவல் / சான்றிதழ் நகல் விவரங்கள் மின் பதிவேட்டிலிருந்து பெறப்பட்டவை. இவற்றை தாங்கள் <http://eservices.tn.gov.in> என்ற இணைய தளத்தில் 29/10/004/00876/170461 என்ற குறிப்பு எண்ணை உள்ளிடு செய்து உறுதி செய்துகொள்ளவும்.
2. இத் தகவல்கள் 24-07-2019 அன்று 12:27:34 PM நேரத்தில் அச்சடிக்கப்பட்டது.
3. கைப்பேசி கேமராவின் 2D barcode படிப்பான் மூலம் படித்து 3G/GPRS வழி இணையதளத்தில் சரிபார்க்கவும்

N. H. M. P. S.



தமிழக அரசு

வருவாய்த் துறை

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

மாவட்டம் : திருநெல்வேலி

வட்டம் : வீ. கே. புதூர்

வருவாய் கிராமம் : ஆனைகுளம்

பட்டா எண் : 1412

உரிமையாளர்கள் பெயர்

1. நவந்திகிருண பாண்டியன் மகன் என்.ஹெச்.எம்.பாண்டியன்



நன்செய்		புன்செய்		மற்றவை	
பரப்பு	தீர்வை	பரப்பு	தீர்வை	பரப்பு	தீர்வை
புல எண்	உட்பிரிவு	ஹெக் - ஏர்	ரூ - பை	ஹெக் - ஏர்	ரூ - பை
304	1A	--	--	0 - 54.00	0.50
304	2A	--	--	0 - 76.50	0.70
		1 - 30.50		1.20	

குறிப்பு2 :



1. மேற்கண்ட தகவல் / சான்றிதழ் நகல் விவரங்கள் மின் பதிவேட்டிலிருந்து பெறப்பட்டவை. இவற்றை தாங்கள் <http://eservices.tn.gov.in> என்ற இணைய தளத்தில் 29/10/004/01412/100428 என்ற குறிப்பு எண்ணை உள்ளீடு செய்து உறுதி செய்துகொள்ளவும்.
2. இத் தகவல்கள் 24-07-2019 அன்று 12:26:03 PM நேரத்தில் அச்சடிக்கப்பட்டது.
3. கைப்பேசி கேமராவின் 2D barcode படிப்பான் மூலம் படித்து 3G/GPRS வழி இணையதளத்தில் சரிபார்க்கவும்

N.H. Raju

	2	3	4	5	6	7	8	9	10	11	12
										By	
										MINING PLAN APPROVED	
										Assistant Director	
										of Mining	
299	1	..	ர	பு	..	7-5	6	0 37	1 11	0 41	273 சீ. சுப்ரமணிய நாடார்.
	2	..	ர	பு	..	7-5	6	0 37	1 06	0 39	118 என். எச். எம். பாண்டியன் (1), கற்பகசுப்பிரமணியபாண்டியன் (2), மீனாட்சிசுந்தரபாண்டியன் (3).
	3	..	ர	பு	..	7-5	6	0 37	1 10	0 41	118 என். எச். எம். பாண்டியன் (1), கற்பகசுப்பிரமணியபாண்டியன் (2), மீனாட்சிசுந்தரபாண்டியன் (3).
	4	..	ர	பு	..	7-5	6	0 37	1 18	0 44	118 என். எச். எம். பாண்டியன் (1), கற்பகசுப்பிரமணியபாண்டியன் (2), மீனாட்சிசுந்தரபாண்டியன் (3).
	5	..	ர	பு	..	7-5	6	0 37	5 33	1 97	118 என். எச். எம். பாண்டியன் (1), கற்பகசுப்பிரமணியபாண்டியன் (2), மீனாட்சிசுந்தரபாண்டியன் (3).
									9 78	3 62	
300	1	..	ர	பு	..	7-5	6	0 37	6 92	2 56	118 என். எச். எம். பாண்டியன் (1), கற்பகசுப்பிரமணியபாண்டியன் (2), மீனாட்சிசுந்தரபாண்டியன் (3).
	2	..	ச	புற	..	..	..	..	0 65	..	வண்டிப் பாதை.
	3	..	ர	பு	..	7-5	6	0 37	0 72	0 27	118 என். எச். எம். பாண்டியன் (1), கற்பகசுப்பிரமணியபாண்டியன் (2), மீனாட்சிசுந்தரபாண்டியன் (3).
									8 29	2 83	
301	1	..	ர	பு	..	7-5	6	0 37	5 44	2 01	264 மு. சுப்ரமணிய நாடார்.
	2	..	ச	புற	..	..	..	..	0 26	..	வண்டிப் பாதை.
	3	..	ர	பு	..	7-5	6	0 37	0 44	0 16	264 மு. சுப்ரமணிய நாடார்.
									6 14	2 17	
302	1	✓..	ர	பு	..	7-5	6	0 37	4 23	1 57	730 ச. முகமது ஈரவத்தர் (1), ச. முகமது மீரான் ராவுத்தர் (2).
	2	..	ர	பு	..	7-5	6	0 37	0 85	0 31	118 என். எச். எம். பாண்டியன் (1), கற்பகசுப்பிரமணியபாண்டியன் (2), மீனாட்சிசுந்தரபாண்டியன் (3).
	3	..	ர	பு	..	7-5	6	0 37	3 96	1 47	118 என். எச். எம். பாண்டியன் (1), கற்பகசுப்பிரமணியபாண்டியன் (2), மீனாட்சிசுந்தரபாண்டியன் (3).
									0 49	..	வண்டிப் பாதை.
									9 53	3 35	
									8 96	..	
303	1	..	ர	பு	..	7-5	6	0 37	4 90	1 81	118 என். எச். எம். பாண்டியன் (1), கற்பகசுப்பிரமணியபாண்டியன் (2), மீனாட்சிசுந்தரபாண்டியன் (3).
304	1	..	ர	பு	..	7-5	6	0 37	4 90	1 81	118 என். எச். எம். பாண்டியன் (1), கற்பகசுப்பிரமணியபாண்டியன் (2), மீனாட்சிசுந்தரபாண்டியன் (3).

True copy

அரசாங்க அலுவலர்

கிராம நிர்வாக அலுவலர்

ஆண்குளம் கிராமம்

303 ச. த.

304 1 .. ர பு .. 7-5 6 0 37

N-Hay Ekan 291

1	2	3	4	5	6	7	8	9	10	11	12
							ரு.பை.	ஏ.செ.	ரு.பை.		
04	2	...	4	...	7-5	6	0 37	6 91	2 56	118	என். எச். எம். பாண்டியன் (1), கற்பகசுப்பிரமணிய பாண்டியன் (2), மீனாட்சிசுந்தரபாண்டியன் (3).
								11 81	4 37		
05	1	...	4	...	7-5	6	0 37	3 70	1 37	118	என். எச். எம். பாண்டியன் (1), கற்பகசுப்பிரமணிய பாண்டியன் (2), மீனாட்சிசுந்தரபாண்டியன் (3).
	2	...	4	...	7-5	6	0 37	2 83	1 45	118	என். எச். எம். பாண்டியன் (1), கற்பகசுப்பிரமணிய பாண்டியன் (2), மீனாட்சிசுந்தரபாண்டியன் (3).
								6 53	2 42		
06	...	...	4	...	7-5	6	0 37	7 52	2 78	118	என். எச். எம். பாண்டியன் (1), கற்பகசுப்பிரமணிய பாண்டியன் (2), மீனாட்சிசுந்தரபாண்டியன் (3).
07	1	...	4	...	7-5	6	0 37	3 98	1 47	118	என். எச். எம். பாண்டியன் (1), கற்பகசுப்பிரமணிய பாண்டியன் (2), மீனாட்சிசுந்தரபாண்டியன் (3).
	...	...	4	...	...	...	...	0 77	...		வண்டிப் பாதை.
								4 75	1 47		
8	...	...	4	...	7-5	6	0 37	9 35	3 46	118	என். எச். எம். பாண்டியன் (1), கற்பகசுப்பிரமணிய பாண்டியன் (2), மீனாட்சிசுந்தரபாண்டியன் (3).
9	...	...	4	...	7-5	6	0 37	6 52	2 41	118	என். எச். எம். பாண்டியன் (1), கற்பகசுப்பிரமணிய பாண்டியன் (2), மீனாட்சிசுந்தரபாண்டியன் (3).
0	...	...	4	...	...	...	...	1 09	...		ஒடை.

ஆக மொத்தம் ... 2,141 21 1,364 66

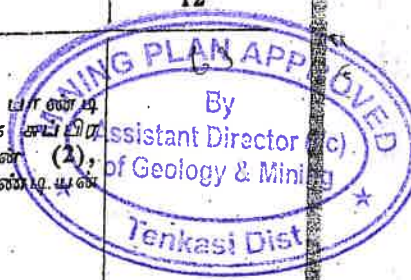
ரூபாய் ஆயிரத்தி முன் ஓரற்றி அறுபத்தி நான் கும்பைசா அறுபத்தாறு மட்டும்.

கிராம நிர்வாக அலுவலர்
4. கைங்குளம் கிராமம்
கிராமப்பஞ்சாயத் வட்டம்

தென்காசி,
21-4-1961.

V. சங்கரன்,
உதவி நிலவரித் திட்ட அதிகாரி.

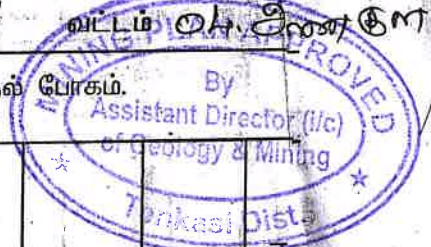
N. H. M. Suban



1429 ஆம் பசலியில் திருவாரூர் மாவட்டம் V.K. H. H. H.

நில வரித் திட்டத்தின்படி
புலன்களின் விபரம்.

முதல் போகம்.



நில வரித் திட்டத்தின்படி புலங்களின் விபரம்.					சாகுபடி யாளரின் பெயர்.		முதல் போகம். By Assistant Director (I/c) of Geology & Mining Tenkasi Dist.						
(1) நில அளவை எண்.	(2) உட்பிரிவு எண்.	(3) பரப்பு.	(4) தீர்வை.	(5) ஒரு போகம் அல்லது இரு போகம்.	(6) கைப்பற்று தாரருடைய பெயரும் எண்ணும் அல்லது அனுபோக தாரருடைய பெயர்.	(7) நிலத்தின் எந்த பகுதி யாவது சாகுபடியாளரால் பயிரிடப்பட்டுள்ளதா.	(8) எந்த மாதத்தில் பயிர் செய்யப்பட்டது எந்த மாதத்தில் அறுவடை செய்யப்பட்டது.	(9) பயிரின் பெயர்.	(10) பயிரான அறுவடையான பரப்பு.	(11) உண்மையான பாய்ச்சல் ஆதாரம்.	(12) விளைச்சல் அளவு விவரம்.		
287	2A	01450040	1764	N.H.M. பாண்டியன்				செவ்வெள்ளை					
289	1B1	02025	0.20	1765	— do —			செவ்வெள்ளை					
289	3	02300	0.20	1402	— do —			செவ்வெள்ளை					
302	1	17050	1.55	876	— do —			செவ்வெள்ளை					
304	1A	05400	0.50	1412	— do —			செவ்வெள்ளை					
304	2A	07650	0.70	1412	— do —			செவ்வெள்ளை					
/ 9 க்கான பக்கம் /													
திருவாரூர்													
கிராம நிர்வாக அலுவலர்													
4. ஆணைகளை கிராம													
நிர்வாகம்புதாரர் வட்டம்													

A purple oval stamp with the text "MINING PLAN APPROVED" around the top edge. In the center, it says "By Assistant Director (I/c) of Geology & Mining". Below this, there is a handwritten signature in black ink. At the bottom of the stamp, the word "Tennessee" is partially visible.

J. N. H. M. N. H. M. N. H. M.

[illegible]

உதவியுடன்
செய்யும்.

N.H.M. Bucher

கலாநாயகர்,
மாநில அமைச்சர்

கலாநாயகர்



V. P. N. L. D.

N. S. S.

S. S. S.

P. S. S.

J. S. S.

S. S. S.

R. S. S.

V. S. S.

S. S. S.

K. S. S.

S. S. S.

S. S. S.

S. S. S.

S. S. S.

S. S. S.

ஆணைகளைக் கீழ்க்கண்டவாறு:

மாண்புமிகு: 287/2A, 289/1B1, 289/3

302/1, 304/1A. அகலவற்றில்

சுமார் 1000 மீட்டர் N.H.M. பாண்டியன் குவாரி

உட்கார்ந்திருக்கிறது. அதன்மீது

ஆணைகளைக் கீழ்க்கண்டவாறு உள்ளதால்

அதன்மீது பிளாட்டிங் செய்யப்படுகிறது.

மாண்புமிகு

கிராம நிர்வாக அலுவலர்

4. ஆணைகளைக் கிராமம்

கிராமத்திலிருந்து வட்டம்

N.H.M. S. S.

PROCEEDINGS OF THE DISTRICT COLLECTOR, TIRUNELVELI

Present: Dr. M. Jayaraman, I.A.S.,



Re.No.M1/31088/2010,

Dated: 28.07.2010.

Sub:- Mines and Minerals – V.K Pudur Taluk – Anaikulam Village – S.F. Nos. 302/1, 304/1A & 2A over an extent of 3.01.0 Hects.. of patta lands – Request for grant of lease for rough stone, jelly etc.. quarry lease application of Thiru. N.H.M. Pandian, Kurundhanmozhi – Tirunelveli District – quarry lease granted – Orders – Issued.

Ref:-

1. Application of Thiru N.H.M. Pandian, Kurundhanmozhi Village, V.K Pudur Taluk, Tirunelveli District, Dated: 22.04.2010.
2. This office M1/16593/2010, dated: 06.05.2010, addressed to the Revenue Divisional Officer, Tenkasi.
3. Revenue Divisional Officer, Tenkasi, A3/4576/2010, Dated: 18.06.2010.
4. Technical Report of the Deputy Director (Geology and Mining) Tirunelveli, Dated: 12.07.2010.

ORDER:-

In the reference 1st cited, Thiru N.H.M. Pandian, S/O Navaneedha Krishna Pandian, 4/10, Kurundhanmozhi, Kurichampatti (Post), V.K Pudur Taluk, Tirunelveli District has applied for quarry lease for quarrying rough stone, jelly and gravel over an extent of 3.01.0 Hects., of patta lands in S.F Nos. 302/1, 304/1A & 2A of Anaikulam Village, V.K Pudur Taluk in Tirunelveli District for a period of five years.

In the reference 2nd cited, the above application was forwarded to the Revenue Divisional Officer, Tenkasi to furnish report regarding the availability of lands applied for lease by the applicant.

The Revenue Divisional Officer, Tenkasi in the reference 3rd cited has reported that the area applied for quarry lease is a dry patta lands and the S.F No. 302 over an extent of 1.70.5 Hects., stand registered in the name of the applicant as per patta No. 876 and the S.F Nos. 304/1A & 2A also stands registered in the name of the

N.H.M. Pandian



applicant as per patta No. 1412 of Anaikulam Village Accounts. As such the applicant has got surface right over the area applied for quarry lease.

The four boundaries for the S.F Nos. applied for lease is as follows:-

S.F. No.	North	South	East	West
302/1	289 & 302/2B	302/4	302/3A & 3B	303
304/1A	302/4	304/2B	304/1B	303
304/2A	304/1A	Kuruchampatti Village	304/2B	303

There is no habitation within the radius of 300 meters. Railway line, National Highways and Water courses are 50mts. away from the area applied for the lease. Ancient monuments, places of worship are not available in the area applied for lease. A1 notice was published in the village. No objection was received. Necessary path way is available for the transportation of quarried materials. The Revenue Divisional Officer, Tenkasi has recommended that the rough stone quarry lease applied for by Thiru. N.H.M. Pandian over an extent of 3.01.0 Hectares of land in S.F .Nos. 302/1, 304/1A & 2A in Anaikulam Village, V.K Pudur Taluk may be granted in favour of the applicant

In the reference 4th cited, the Deputy Director, Geology and Mining, Tirunelveli has reported that the area applied for quarry lease is a flat terrain. Observation of the existing quarry in S.F No.303 the rock type available in the area applied for quarry is of Charnockite rock covered by the red gravelly soil and weathered rock mantle as over burden soil and the average thickness of over burden red gravelly soil ranges from 1.0 to 1.5 meters followed by weathered rock mantle up to 3.0 to 4.0 meters. Hence considerable earth work has to be done to touch the Charnockite rock out crop. No inhabited site is seen within the 300 meters radius. One cart track is passing East – West direction in the southern side of the S.F No. 302/1 and on the northern side of the S.F No.

N. H. M. Pandian

304/1A i.e. the area applied for quarry lease except the cart track no permanent structures are noticed in and around the area applied for quarry lease (such as Railway line, Public road etc.,) within 50 meters radius. On the western side of the area applied for quarry lease malai poramboke land are noticed in S.F. No. 303 and hence a safety distance of 10.0 meters provided for the poramboke land and 10.0 meters safety distance provided for the cart track. The rock type found to occur in this area can be used in construction and other allied activities.



Finally the Deputy Director, Geology and Mining, Tirunelveli has reported that the quarry lease application of Thiru N.H.M. Pandian, S/O Navaneedha Krishna Pandian, 4/10, Kurundhanmozhi, Kurichampatti (Post), V.K. Pudur Taluk, Tirunelveli District for quarrying rough stone, jelly and gravel after deleting an extent of 0.50.0 Hect., safety distance to the Government Poramboke land and cart track an extent 2.51.0 Hects., of patta lands in S.F Nos. 302/1 Part (1.43.5 Hects.), 304/1A Part (0.41.5 Hect.) & 304/2A Part (0.66.0 Hect.) in Anaikulam Village, V.K. Pudur Taluk in Tirunelveli District may be considered for the grant of quarry lease in favour of the applicant for a period of five years as per Rule 19 and 20 of Tamil Nadu Minor Mineral Concession Rules 1959 for a period of 5 years by stipulating the following conditions.

1. Quarrying should be done without any hindrance to the adjacent pattadars.
2. Quarrying should be done 7.5 meters away from the Northern, Southern and Eastern boundaries of the area applied for quarry lease.

Based on the recommendation of the Revenue Divisional Officer, Tenkasi and the Deputy Director of Geology and Mining, Tirunelveli the quarry lease is hereby granted to Thiru N.H.M. Pandian, S/O Navaneedha Krishna Pandian, 4/10, Kurundhanmozhi, Kurichampatti (Post), V.K. Pudur Taluk, Tirunelveli District for quarrying rough stone, jelly and gravel after deleting an extent of 0.50.0 Hect., safety

1-4-35
361-5
666-0
51.0
N.H.M. Pandian



distance to the Government Poramboke land and cart track an extent 2.51.0 Hectrs. of patta lands in S.F Nos. 302/1 Part (1.43.5 Hectrs.), 304/1A Part (0.41.5 Hectrs.) & 304/2A Part (0.66.0 Hectrs.) in Anaikulam Village, V.K. Pudur Taluk in Tirunelveli District for a period of five years from the date of execution of lease deed as per Rule 19 and 20 of Tamil Nadu Minor Mineral Concession Rules 1959 for a period of 5 years by stipulating the following conditions.

1. Quarrying should be done without any hindrance to the adjacent pattadars.
2. Quarrying should be done 7.5 meters away from the Northern, Southern and Eastern boundaries of the area applied for quarry lease.

SD/- M. Jayaraman,
District Collector,
Tirunelveli.

// True Copy //

For District Collector,
Tirunelveli.

To
Thiru N.H.M. Pandian.
S/O Navaneedha Krishna Pandian,
4/10, Kurundhanmozhi,
Kurichampatti (Post),
V.K Pudur Taluk,
Tirunelveli District.

Copy to
The Revenue Divisional Officer, Tenkasi.
The Tahsildar, V.K Pudur.
The Village Administrative Officer, Anaikulam Village.

N.H.M. Pandian



தமிழ்நாடு தமில்நாடு TAMILNADU

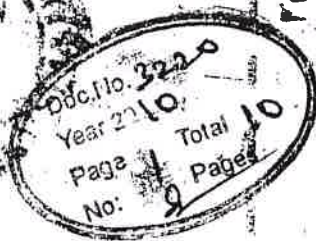
Rs.5000/-

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- 5 AUG 2010

N.H.M. பாலகங்காண்டி -
திருநெல்வேலி

M. VELMURUGAN
STAMP VENDOR, L. No: 2/2008
2, Thirupugal Street,
PALAYAMKOTTAI,
TAMIL NADU



APPENDIX - IV
(See Rule - 22)

**FORM OF AGREEMENT FOR QUARRYING AND CARRYING AWAY MINOR
MINERALS FROM RYOTWAR LANDS IN WHICH THE MINERALS BELONGS TO
THE GOVERNMENT**

**TIRUNELVELI DISTRICT COLLECTOR'S PROCEEDINGS R.C.NO.M1/31088/2010
DATED 28.07.2010**

ANTICIPATED SEIGNIORAGE FEE	:	Rs. 81,000/- Per Annum
AREA ASSESSMENT	:	Rs. 251/- Per Annum
SECURITY DEPOSIT	:	Rs. 5,000/-

THIS AGREEMENT made this ... 19th ... Day of August 2010 between Thiru.N.H.M. Pandian, S/o. Navaneedha Krishna Pandian, 4/10, Kurundhanmozhi, Kurichampatti Post, V.K. Pudur Taluk, Tirunelveli District (hereinafter referred to as the registered holder which term shall include in these presents where the context so admits include also his heirs, executors, administrators, legal representatives and assigns) of the one part and the Governor of Tamil Nadu (hereinafter called "the Government" which terms shall were the context so admits, include also his successors in office and assigns) of the other part.

N.H.M. Pandian
N.H.M. Pandian
LESSEE

[Signature]
LESSOR
COLLECTOR
TIRUNELVELI.

N.H.M. Pandian

MINING PLAN APPROVED
By Assistant Director (IC) of Geology & Mining
Document No. 3220 of 2010
Page 9 Total Pages 10
No. 9

Document No. 3220 of 2010
of Book 1 contents 8
Sheet 1 sheet

[Signature]
SUB-REGISTRAR

Presented in the Office of The Sub-Registrar of Gururuchi and fee of Rs. 4100+100 Paid between The Hours 10-11 and 24th on the August 2010 by



LEFT THUMB



N.H.M. Pandian.

s/o Navaneetha Krishna Pandian, 4/10 Kurudham mozhin, Kurrichampatti post, V.K. Pudum Taluk, family card NO. 29/C1/0397322 checked.

EXECUTION ADMITTED BY

LEFT THUMB



N.H.M. Pandian

s/o Navaneetha Krishna Pandian, -do-

IDENTIFIED BY

Shri M. Jayaraman IAS, District Collector, Tirunelveli, who is exempted from personal appearance under Section 88(1) of the Registration Act.

I have satisfied myself as to the execution of the instrument by Thiru M. Jayaraman IAS, District Collector, Tirunelveli, who is exempted from personal appearance under Section 88(1) of the Registration Act.

24th Day of August 2010

N.H.M. Pandian

[Signature]
SUB-REGISTRAR
D. WATWUUSI



WHEREAS the registered holder holds (amongst others) the lands described in the schedule hereunder written (hereinafter referred to as the said lands)

AND WHEREAS the registered holder had made application to the Collector of the District of Tirunelveli (hereinafter referred to as "the Collector") seeking grant of quarrying lease for quarrying ROUGHSTONE/JELLY/GRAVEL in the said lands to deposit mining waste in the said lands and has lodged with the Collector an accurate map or sketch of the said lands.

AND WHEREAS the District Collector, acting for and on behalf of the Government has granted a quarrying lease to the registered holder and allowed him to commence quarrying operation for ROUGHSTONE/JELLY/GRAVEL in the said lands vide the Proceedings R.C.NO. M1/31088/2010 DATED 28.07.2010 for a period of 5 years from the date of execution of the lease deed and to deposit mining waste thereon by the registered holder.

AND WHEREAS, the registered holder has deposited with Collector, a sum of Rs.5,000/- as Security against any loss or damage which may be incurred by the Government by reason of any of the said lands being rendered unfit for cultivation / by any mining operations therein of the registered holder or by the deposit of mining waste thereon by the registered holder.

NOW THESE PRESENTS WITNESS and the registered holder both hereby agree with the Government in the manner following, that is so say :-

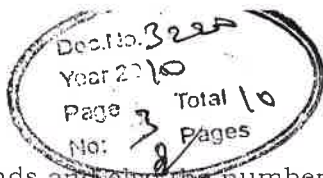
- 1) The registered holder shall be at liberty at all times during the period of the lease to carry on mining operations for ROUGHSTONE/JELLY/GRAVEL in the said land in a proper workman like manner and to deposit mining waste on the said lands and shall at the times be answerable and accountable to the Government for all acts and defaults by any of his nominees, servants or agents in carrying on such operations or in making such deposit.
- 2) The registered holder has paid a sum of Rs.1255/-towards land assessment / area assessment/@ Rs.100/- per Hect. for a period of 5 years. In the event of the Government revising the rates the lessee is liable to pay the enhanced land assessment as fixed by the Government from time to time and so long as he shall have carried on any such mining operations as aforesaid pay to the Collector for and on behalf of the Government in addition to the land assessment for the time being payable in respect of the said lands; seigniorage on the minor minerals at the rate specified in Appendix II to the Tamil Nadu Minor Minerals Concessions Rules 1959. The anticipated average Seigniorage Fee is Rs. 81,000/-.
- 3) The registered holder shall and will keep correct accounts in such form as the collector shall from, time to time require and direct showing the quantities and other particulars of all mineral obtained by the registered holder from the said

N.H.M. Pandian
N.H.M. Pandian

LESSEE

N.H.M. Pandian


LESSOR
COLLECTOR
TIRUNELVELI.



-3-



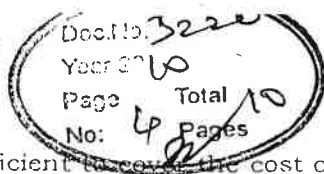
lands and also the number of persons employed in carrying on the said mining operations therein and shall from time to time when so directed by the Collector/prepare and maintain complete and correct plans of all mines and working in the said lands and shall allow any officer hereunto authorised by the Commissioner and Director of Geology and Mining, Chennai from time to time and at any time to examine such accounts and any such plans and shall when so required supply and furnish all such information and returns regarding all or any of the matter aforesaid as the Government shall, from time to time, require and direct.

- 4) The registered holder shall and will at all times allow any officer authorized by the Commissioner and Director of Geology and mining, Chennai in that behalf to enter upon any part of the said lands where any mining operations may be carried on for the purpose of inspecting the same.
- 5) The registered holder shall forthwith send to the District Collector a report of any accident which may occur at or in the said lands and also of the discovery of any mineral other than ROUGHSTONE/JELLY/GRAVEL.
- 6) It shall be lawful for the registered holder at anytime to cease mining operations under these presents provided, he shall pay to the District Collector for and on behalf of the Government land assessment, cess and seigniorage fee due to the Government and shall restore the said lands or fence or fill in abandoned pits and excavations therein if required by the District Collector and upon his so doing these presents cease and determine.
- 7) In case the registered holder shall relinquish the whole or any part of the said lands or increase of the expiry or sooner determination of this agreement then and in any such case, he shall restore the lands so relinquished or so much thereof as the District Collector shall require to restore any such lands which he shall be required to restore to a state fit for cultivation or shall securely and permanently fence or fill in all such abandoned pits and excavations there in as the District Collector shall require to be so fenced or filled in and in case the registered holder shall fail or neglect to restore any such land which he shall be required to restore to a state fit for cultivation or to so fence or fill in any such abandoned pit, or excavation which he shall be required to so fence, or fill in them and in any such case, it shall be lawful for the Collector to so restore any such lands, or as the case may be, to so fence or fill any such pits or excavation at the expense of the registered holder and to supply the said sum of Rs.5,000/- so deposited in or towards the cost of so doing and to deduct from the amount of the said deposit and retain on behalf of the Government a sum equal to thirty times the assessment of the said lands which shall have been rendered unfit for cultivation. If however, the amount of deposit is not

N. H. M. Pandian
N. H. M. Pandian
LESSEE

LESSOR
COLLECTOR
TIRUNELVELLI.

N. H. M. Pandian



- 4 -

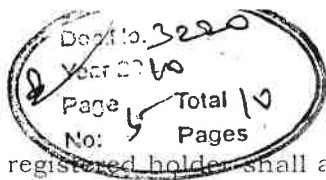


- sufficient to cover the cost of such restoration or fencing or filling in or to be made thirty times the assessment on the area rendered uncultivable, it shall be lawful for the Government to recover the balance by resort to civil court.
- 8) The registered holder shall not be entitled to any remission of assessment in respect of any of the said lands which shall be rendered unfit for surface cultivation by carrying on of any mining operations or by the deposit of mining waste, unless thirty times the assessment thereon has already been deducted under the proceeding clause.
 - 9) The registered holder shall not assign, lease or part with the possession of the said lands or any part thereof for the whole or any part of the said term without previous intimation in writing to the District Collector.
 - 10) If the registered holder does not intend to carry on mining operations himself, but intends to lease out the right to do so to another person the registered holder and his Lessee shall enter into an agreement with Government binding themselves jointly and severally to accept the conditions and stipulations herein contained which agreement shall be in the form set out in Appendix V to the Tamil Nadu Minor Mineral Concession Rules, 1959.
 - 11) All land assessment, cess and seigniorage payable under these presents shall be recoverable under the provisions of the Madras Revenue Recovery Act, 1864 as if they were arrears of land revenue.
 - 12) In the event of any breach by the registered holder by any of the conditions of this agreement, it shall be lawful for the Government to levy enhanced seigniorage or for the Collector to give notice in writing to the registered holder of his intention to cancel these presents where upon the same shall stand cancelled but without prejudice to any rights which the Government may have against the Pattadar in respect of any antecedent claim or breach of covenant or condition.
 - 13) Any notice to be given to the registered holder may be addressed to his last known place of abode and where a notice has been so addressed it shall be deemed to have been duly served for the purpose of these presents.
 - 14) Should any question or dispute arise regarding the agreement executed in pursuance of these rules or any matter or thing connected therewith or the powers of the registered holder there-under, the amount or payment of the seigniorage fee or area assessment made payable thereby, the matter in issue shall be decided by the Commissioner and Director of Geology and Mining. In case the registered holder/registered holders, lessee/lessees is/are not satisfied with the decision of the Commissioner and Director of Geology and Mining, the matter shall be referred to the State Government for decision.

N. H. M. Pandian
N. H. M. Pandian
LESSEE

N. H. M. Pandian


LESSOR
COLLECTOR
TIRUNELVELLI.



-5-



- 15) The registered holder shall abide by the conditions laid down in the payment of Wages Act, 1936 (Central Act IV of 1936), the Mines Act, 1952 (Central Act XXXV of 1952) and the Indian Explosives Act, 1884 (Central Act IV of 1884).
- 16) The date of commencement of the period of lease shall be date on which the agreement is executed.
- 17) The lessee shall pay seigniorage or dead rent whichever is more in respect of the actual quantity of Mineral removed at the rates prescribed from time to time in Appendix-II of the Tamil Nadu Minor Mineral Concession Rules 1959.
- 18) The lessee should keep correct accounts showing the quantities and other particulars of all minerals obtained from the lands permitted to quarry.
- 19) The lessee should also allow any Officer authorised by the District Collector or any officer authorised by him in this behalf or any other Officer authorised by the State Government in this behalf to inspect the area and verify records and accounts and furnish such information under the terms as may be required by them.
- 20) The lessee shall carryout the quarrying operations in skillful, scientific systematic manner keeping in view the proper safety of the labour conservation of minerals and preservation of environmental ecology.
- 21) The lessee shall allow any Officer authorised by the District Collector or Commissioner and Director of Geology and Mining to enter upon the area and inspect for the purpose mentioned in conditions 4 and 6 above and also carry out the direction issued to the satisfaction of the above said authorities.
- 22) The lessee should restrict his mining operation strictly within the permitted area as defined in the sketch.
- 23) The terms and conditions are also subject to such further modifications, deletion and additions, alternations as may entered by the Government to be included in the agreement to be executed for this purpose. The lessee should maintain at his cost proper sign boards indicating the Survey Numbers, years of the lease, name of the lease holder and the lease period to the satisfaction of the District Collector/Commissioner and Director of Geology and Mining and maintain it all time at the quarry site.
- 24) The lessee should make his own arrangements to form the approach road from the public road to the place of quarry.
- 25) The lessee shall strictly adhere to the statutory and safety requirements as per Act and Rules from time to time.
- 26) This quarry lease is governed by the Tamil Nadu Minor Mineral Concession Rules 1959 and M&M (D & R) Act 1957.

N. H. M. Pandian
N. H. M. Pandian
LESSEE


LESSOR
COLLECTOR
TIRUNELVELI.

N. H. M. Pandian

SPECIAL CONDITIONS IMPOSED BY THE DISTRICT COLLECTOR IN PROCEEDINGS R.C.NO. M1/31088/2010 DATED. 28.07.2010



SPECIAL CONDITIONS:

1. Quarrying should be done without any hindrance to the adjacent pattadars.
2. Quarrying should be done 7.5 metres away from the Northern, Southern and Eastern boundaries of the area applied for quarry lease.

THE SCHEDULE

In the village of Anaikulam village, V.K. Pudur Taluk, Tirunelveli District, in the Registration District of

No. and Name of Taluk	Name of the village	Survey Field Number	Extent in Acres.	Four Boundaries (S.F.Nos.)			
				N.	S.	E.	W.
VK Pudur	Anaikulam	302/1 (part)	1.43.5	289 & 302/2B	302/4	302/3A & 3B	303
		304/1A (Part)	0.41.5	302/4	304/2B	304/1B	303
		304/2A (Part)	0.66.0	304/1A	Kuricham patti village	304/2B	303
		Total	2.51.0				

IN WITNESS whereof Dr. M.Jayaraman, I.A.S., District Collector, Tirunelveli acting for and on behalf and by the order and direction of the Governor of Tamil Nadu and Thiru.N.H.M. Pandian, S/o. Navaneedha Krishna Pandian, 4/10, Kurundhamozhi, Kurichampatti Post, V.K. Pudur Taluk, Tirunelveli District have hereunto set their respective hands.

N.H.M. Pandian
N.H.M. Pandian
LESSEE

[Signature]
LESSOR
COLLECTOR
TIRUNELVELI.

Signed by the above named Lessee in the Presence of

Signed by the Lessor in the Presence of

1. *[Signature]*
(AHMED SHEIK)
6, FIRST STREET
SHERIE NAGAR
VADAKARAI

1. *[Signature]*
(C. MOHANASUNDARAM)
DEPUTY DIRECTOR
Dept. of Geology & Mining
Tirunelveli

2. *[Signature]*
(P. RADHA KRISHNAN)
11, VEERAPUTHIRAN STREET
SHERGODAI

Prepared by

2. *[Signature]*
(S. SORNARAT)
Special Deputy Tahsildar,
(Mines)
Tirunelveli.

S. M. Subbmanickavasagam Pillai
LIC No: B. 2233 / TKS / 1984

N.H.M. Pandian

Document No 3220 of 2000
 of Book 1 contents 8
 Sheet 8 sheet

[Signature]
 SUB-REGISTRAR



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N. H. M. Roshan

RECEIVED
M. H. M. RAO
10/12/2007



**CERTIFICATE OF RECOGNITION AS
QUALIFIED PERSON TO PREPARE MINING PLANS**
(Under Rule 22 C of Mineral Concession Rules, 1960)

*Shri T.S. Ganesan resident of Beach Minerals (Sands) Company,
Mahadevankulam, Tisaiyanvilai - 628 657 Tamil Nadu, son of Shri.
S.Sudalimuthu having given satisfactory evidence of his qualifications and
experience is hereby granted recognition under Rule 22C of the Mineral Concession
Rules, 1960 as a Qualified Person to prepare Mining Plans.*

His registration number is

RQP/MAS/142/2000/A

The recognition is valid for a period of ten years ending 27.01.2002

*Place : Chennai
Date : 31.01.2007*

(B. Babu Rao)
Regional Controller of Mines
Indian Bureau of Mines
Chennai Region

रखी
Renewed up to 27-01-2012

(B. Babu Rao)
REGIONAL CONTROLLER OF MINES
INDIAN BUREAU OF MINES
CHENNAI REGION

T.S. Ganesan
T.S. GANESAN, M.Sc.,
RQP/MAS/142/2000/A

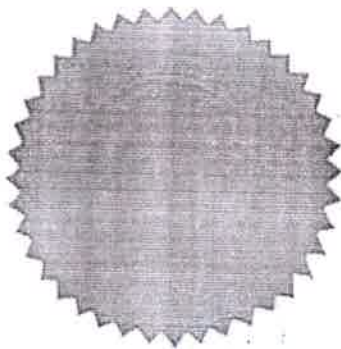
N.H.M. RAO



பாரதிதாசன் பல்கலைக்கழகம்

அறிவியற் புலம்

பாரதிதாசன் பல்கலைக் கழக ஆட்சிக்குழு 1999 ஆம் ஆண்டு செயல்முறை நிலத்தியல் பிரிவில் நடத்திய தேர்வில் தெ.சு.சு.கே.என்.சன் எனப்பவர் வகுப்பில் தேர்ச்சி பெற்றார் என்று தக்க தேர்வாளர்கள் சான்றளித்தபடி செயற்பாட்டரீதியில் நிறைஞர் என்னும் பட்டத்தை அவருக்குப் பல்கலைக் கழக இலக்கினையுடன் வழங்குகிறது.



திருச்சிராப்பள்ளி
Tiruchirappalli

நாள் : 28 DEC 1990
Dated :


பதிவாளர் Registrar



BHARATHIDASAN UNIVERSITY

FACULTY OF SCIENCE



The Syndicate of the BHARATHIDASAN UNIVERSITY hereby makes known that T S GANESAN has been admitted to the Degree of MASTER OF SCIENCE IN APPLIED SCIENCE, he having been certified by duly appointed Examiners to be qualified to receive the same in Branch APPLIED GEOLOGY at the Examination held in April 1999 and placed in FIRST Class.

Given under the Seal of the University.

T.S. Ganesan

T.S. GANESAN, M.Sc.,
RQP/MAS/142/2000/A


துணைவேந்தர் Vice-Chancellor

W.H.M. Padman



RDCW/HR/PER - 051083



Mr. T S Ganesan
Assistant Manager - Mines Operation
Reddipalayam Cement Works

Dear Mr. T S Ganesan,

This has reference to your letter of resignation dated 30th Sep, 2016.

The resignation tendered by you is accepted and you are relieved from the services of UltraTech Cement Limited - Reddipalayam Cement Works at the closing of office hours on 30th Sep, 2016.

You are advised to receive your Full and Final settlement from our Accounts department by submitting the No Dues Certificate.

We wish you all the very best in your further endeavors.

Yours Faithfully,

For ULTRATECH CEMENT LTD
Unit: Reddipalayam Cement Works

VC Joy
DH - Administration

22.09.2016
01:00:10 (10:12 AM) 003

N.H.M. Poolam

T.S. Ganesan
T.S. GANESAN, M.Sc.,
RQP/MAS/142/2000/A

UltraTech Cement Ltd.
(Unit: Reddipalayam Cement Works)

Reddipalayam Post, Ariyalur Tk. & Dist - 621704, Tamilnadu Tel: (04329) 249240 (10 lines); Fax: (04329) 249253/249363
Regd. Office: 'B' Wing, Ahura Centre, 2nd Floor, Mahakali Caves Road, Andheri (E), Mumbai-400 093 Tel: 022- 66917800 Fax: 022-66928109
Website: www.ultratechcement.com, www.adityabirla.com CIN : L26940MH2000PLC128420



BEACH MINERALS COMPANY PVT LTD

(100% EOU)

BMC House 32-2, Halls Road, Post Box No. 789, Egmore, Chennai-8, T.N, India.

Telephone : + 91 44 5214 7780 / 90 Fax : + 91 44 52146000

e-Mail : info@bmcindia.net

TO WHOMSOEVER IT MAY CONCERN

This is to certify that, **SRI.T.S.GANESAN**, S/o. S. Sudalai Muthu, has worked as "**Senior Geologist**" in our concern, from **February 1997 to April 2008**. He is also a Recognized qualified person to preparing mining plan. He has gained wide range of experience in Mining prospecting, Estimation of mineral reserves, Identification of new mineral areas, expansion and development of company's industrial activities. He is expert in Quality Control and product management for industrial competence of our concern. In short he is reliable and experienced.

He is leaving our concern for his better prospects and we wish him bright future.

For Beach Minerals Company Private Limited,

Date : 30.04.2008

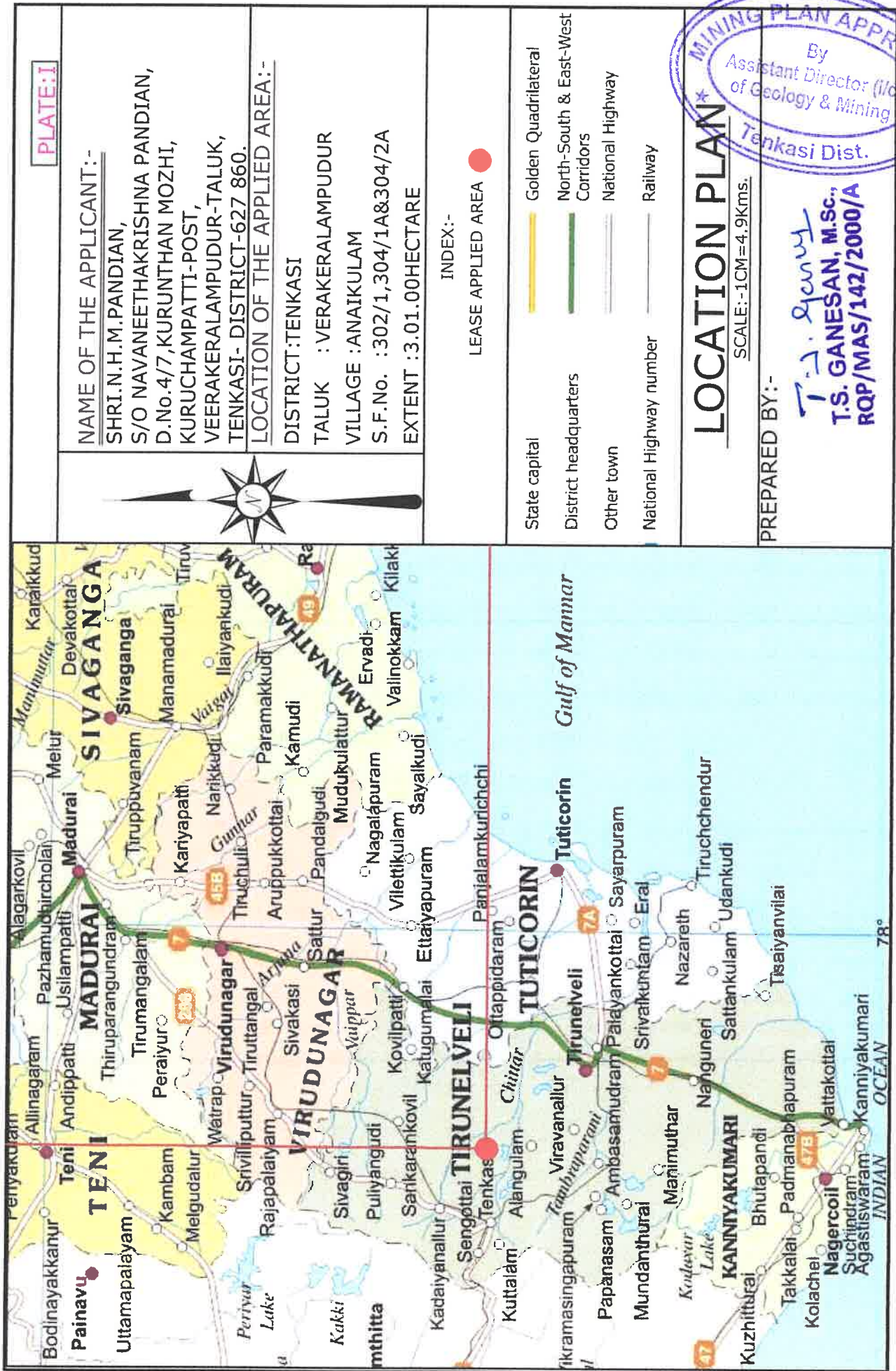
Place : Kuttam

C. S. Natarajan
Manager (Mines)
(C.S.Natarajan)

T.S. GANESAN, M.Sc.,
RQP/MAS/142/2000/A

T.S. Ganesan
T.S. GANESAN, M.Sc.,
RQP/MAS/142/2000/A

N.H.M. Pasham



No. 14 M. Pandian

PLATE:IA

NAME OF THE APPLICANT:-

SHRI.N.H.M.PANDIAN,
S/O NAVANEETHAKRISHNA PANDIAN,
D.No.4/7,KURUNTHAN MOZHI,
KURUCHAMPATTI-POST,
VEERAKERALAMPUDUR-TALUK,
TENKASI- DISTRICT-627 860.

LOCATION OF THE APPLIED AREA:-

DISTRICT:TENKASI

TALUK : VERAKERALAMPUDUR

VILLAGE : ANAIKULAM

S.F.No. : 302/1,304/1A&304/2A

EXTENT : 3.01.00HECTARE

INDEX:-

PROPOSED SITE

NATIONAL HIGH WAY

STATE HIGH WAY

PANCHAYAT ROAD

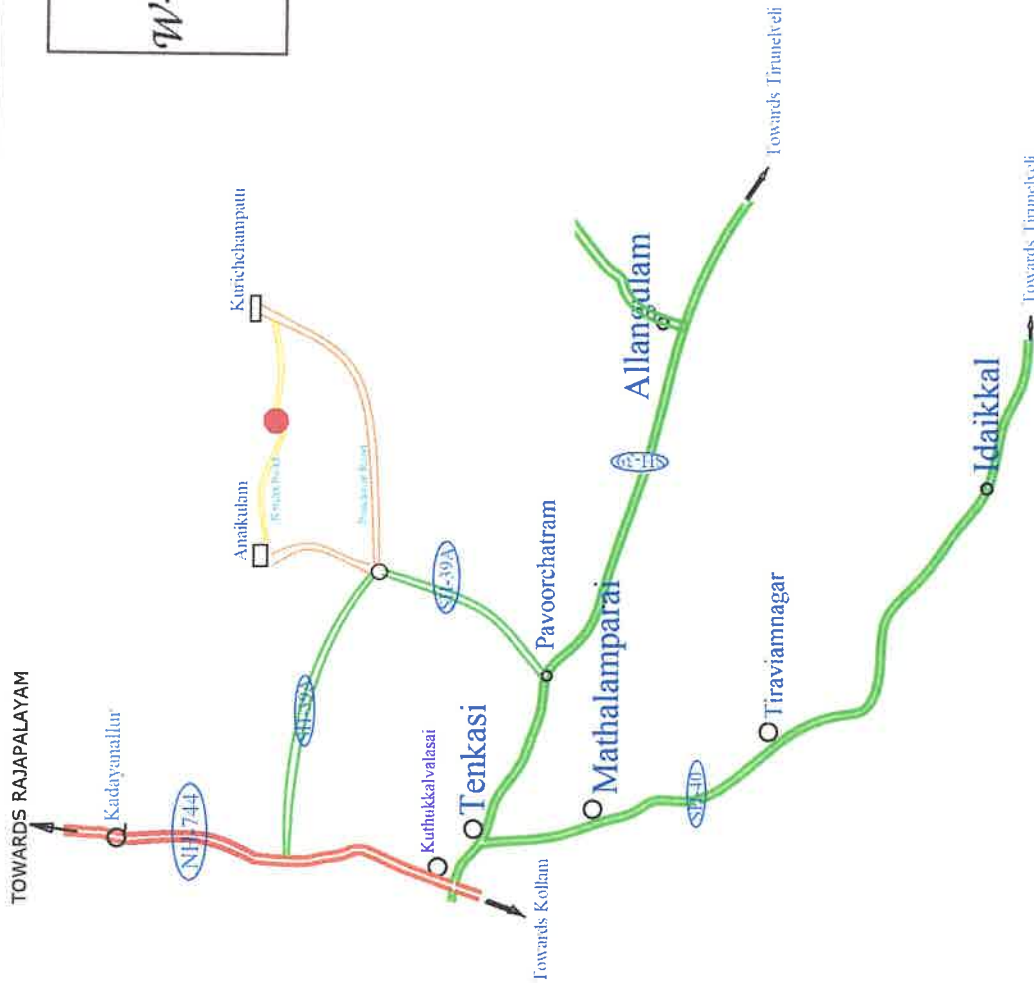
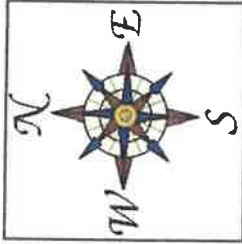
APPROACH ROAD

KEY MAP

NOT TO SCALE

PREPARED BY:-

T.S. Ganesan
T.S. GANESAN, M.Sc.
RQP/MAS/142/2000/A



N.H.M. Pandian



NAME OF THE APPLICANT:-

SHRI.N.H.M.PANDIAN,
S/O NAVANEETHAKRISHNA PANDIAN,
D.No.4/7,KURUNTHAN MOZHI,
KURUCHAMPATTI-POST,
VEERAKERALAMPUDUR-TALUK,
TENKASI- DISTRICT-627 860.

LOCATION OF THE APPLIED AREA:-

DISTRICT:TENKASI
TALUK : VERAKERALAMPUDUR
VILLAGE : ANAIKULAM
S.F.No. : 302/1,304/1A&304/2A
EXTENT : 3.01.00HECTARE

TOPO SHEET NO:-58 G/1

LATITUDE :-09°00'05.83"TO 09°00'16.00"

LONGITUDE :-77°28'32.52" TO 77°28'37.57"

LEASE AREA

WIND DIRECTION

5 KM RADIUS

CONVENTIONAL SYMBOLS

Express highway with toll with bridge with drainage	
Roads marked according to importance	
Roads, paths, causeways according to importance	
Unimproved road, Cart-track, Path-track with post, cross-stick	
Schematic symbols in bold, unimproved, Cause	
Drain, majority of rock, sand, sandstone, Water	
River, dry with water channel, with island & rocks, Tidal river	
Canal, irrigation, canal, Special, drainage, Roads	
Wells, hand, unlined, Tubewell, Spring, Trench, covered, dry	
Embankments, road, or rail, low, low, ground	
Railways, train, gauge, double, single with station, under construction	

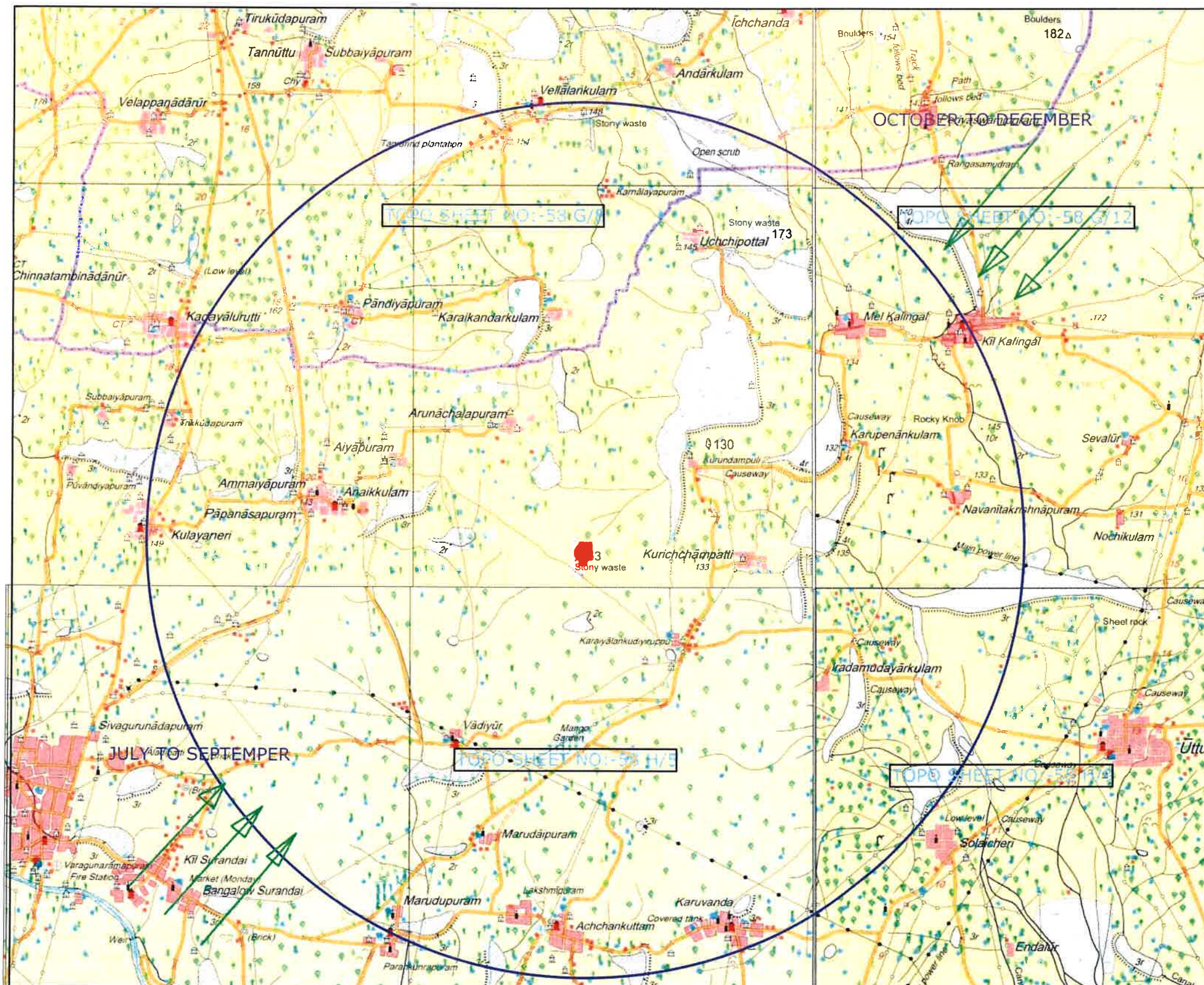
KEY PLAN

(SCALE:-1:50,000)

PREPARED BY:-

T.S. GANESAN
T.S. GANESAN, M.Sc.,
RQP/MAS/142/2000/A

N.H.M. Pandian





SAFETY DISTANCE FROM PATTALANDS = 7.5M
SAFETY DISTANCE FROM ODAI = 10M
SAFETY DISTANCE FROM CART TRACK = 10M
SAFETY DISTANCE FROM Govt.LAND = 10M

CORNER PILLARS GPS CO-ORDINATES :

PILLAR	LATITUDE	LONGITUDE
1	9° 00' 16.00" N	77° 28' 36.80" E
2	9° 00' 12.16" N	77° 28' 37.57" E
3	9° 00' 11.00" N	77° 28' 33.28" E
4	9° 00' 15.86" N	77° 28' 32.52" E
5	9° 00' 11.57" N	77° 28' 35.95" E
6	9° 00' 09.52" N	77° 28' 36.56" E
7	9° 00' 09.48" N	77° 28' 36.00" E
8	9° 00' 06.15" N	77° 28' 36.46" E
9	9° 00' 05.83" N	77° 28' 34.02" E
10	9° 00' 10.80" N	77° 28' 33.27" E

AREA DETAILS

Sl. No.	SF.No.	Extent in Hectares
1	302/1	1.70.50
2	304/1A	0.54.00
3	304/2A	0.76.50
	TOTAL	3.01.00

PLATE . III

NAME OF THE APPLICANT :-

SHRI.N.H.M.PANDIAN,
S/O NAVANEETHAKRISHNA PANDIAN,
D.No.4/7,KURUNTHAN MOZHI,
KURUCHAMPATTI-POST,
VEERAKERALAMPUDUR-TALUK,
TENKASI- DISTRICT-627 860.

LOCATION OF THE APPLIED AREA :-

DISTRICT:TENKASI
TALUK : VERAKERALAMPUDUR
VILLAGE : ANAIKULAM
S.F.No. : 302/1,304/1A&304/2A
EXTENT : 3.01.00HECTARE

INDEX :-

- LEASE APPLIED AREA
- BOUNDARY PILLARS
- SAFETY LINE
- CART TRACK
- ODAI

MINING LEASE PLAN

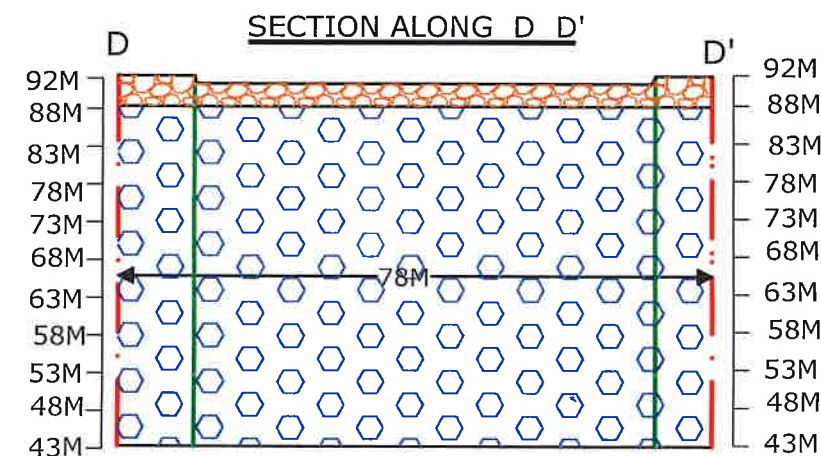
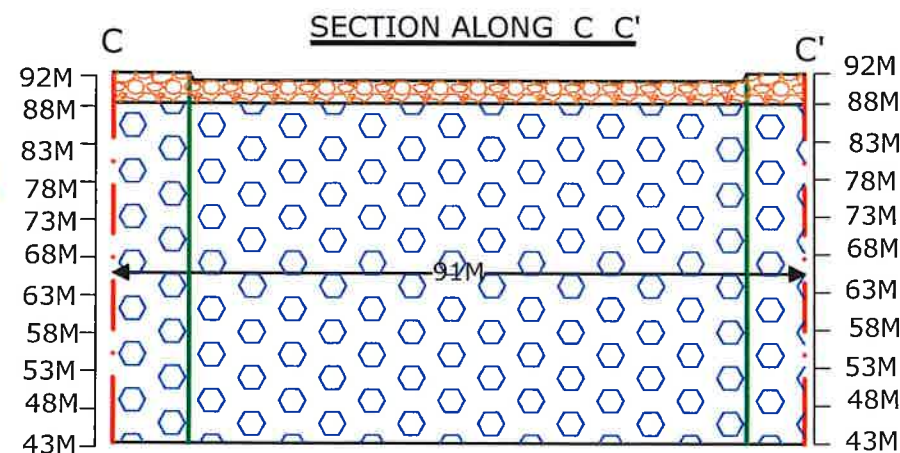
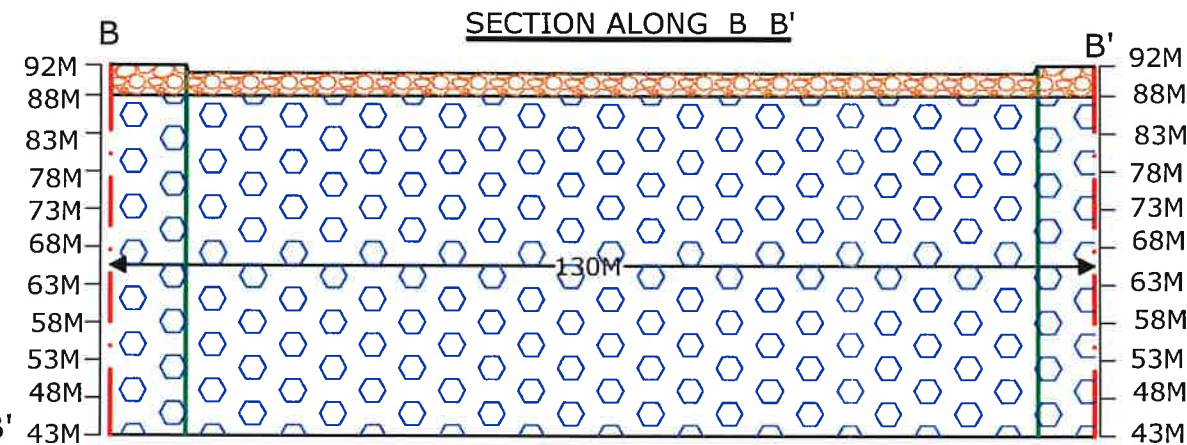
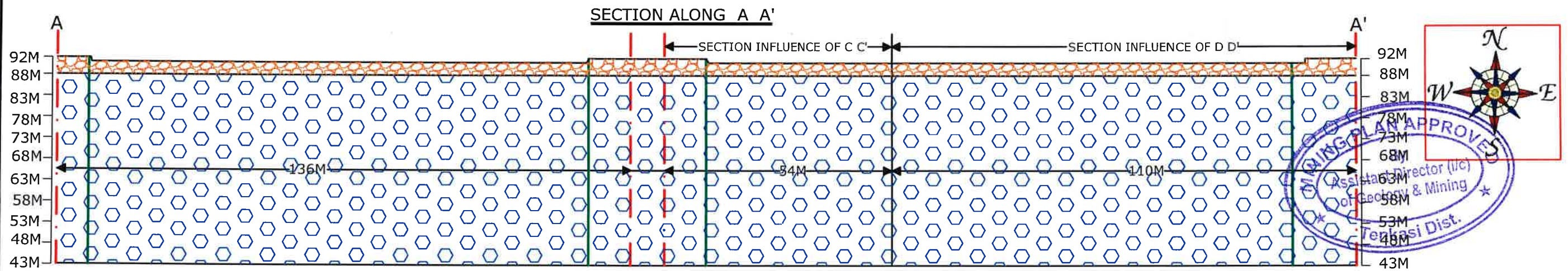
SCALE:- 1: 1,000

PLANS AND SECTIONS ARE PREPARED BASED ON THE LEASE MAP AUTHENTICATED BY THE STATE GOVERNMENT.



T.S. GANESAN, M.Sc.
RQP/MAS/142/2000/A

N.H.M. Pandian



EXISTING PIT DIMENTION

PIT	LENGTH	WIDTH	DEPTH	GRAVEL VOLUME M ³
PIT-1	117M	111M	(0-1) 1.0M	12,987
PIT-2	54M	12M	(1-2) 1.0M	648
PIT-3	140M	54M	(0-1) 1.0M	7,560
PIT-4	16M	10M	(1-2) 1.0M	160
TOTAL EXCAVATION				21,355

GEOLOGICAL RESERVES

SECTION	LENGTH	WIDTH	DEPTH	CHORNOCKITE VOLUME M ³	GRAVEL VOLUME M ³
A A'&B B'	136M	130M	4.0M	-	70,720
A A'&C C'	54M	91M	4.0M	-	19,656
A A'&D D'	110M	78M	4.0M	-	34,320
TOTAL GEOLOGICAL RESERVES				14,02,830	1,24,696
ALREADY EXCAVATED				-	21,355
BALANCE GEOLOGICAL RESERVES				14,02,830	1,03,341

PLATE . IV

NAME OF THE APPLICANT:-

SHRI.N.H.M.PANDIAN,
S/O NAVANEETHAKRISHNA PANDIAN,
D.No.4/7,KURUNTHAN MOZHI,
KURUCHAMPATTI-POST,
VEERAKERALAMPUDUR-TALUK,
TENKASI- DISTRICT-627 860.

INDEX:-

LEASE APPLIED AREA	
SAFETY LINE	
GRAVEL	
CHORNOCKITE	
EXISTING PIT	
BENCH MARK	

SURFACE CUM GEOLOGICAL

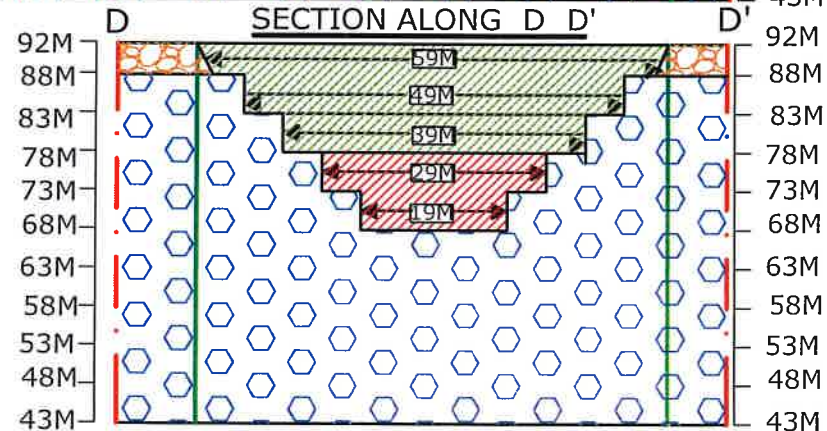
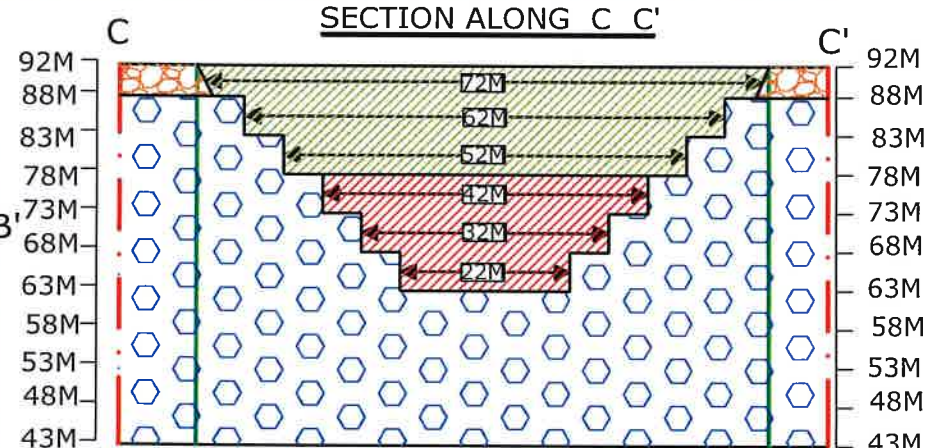
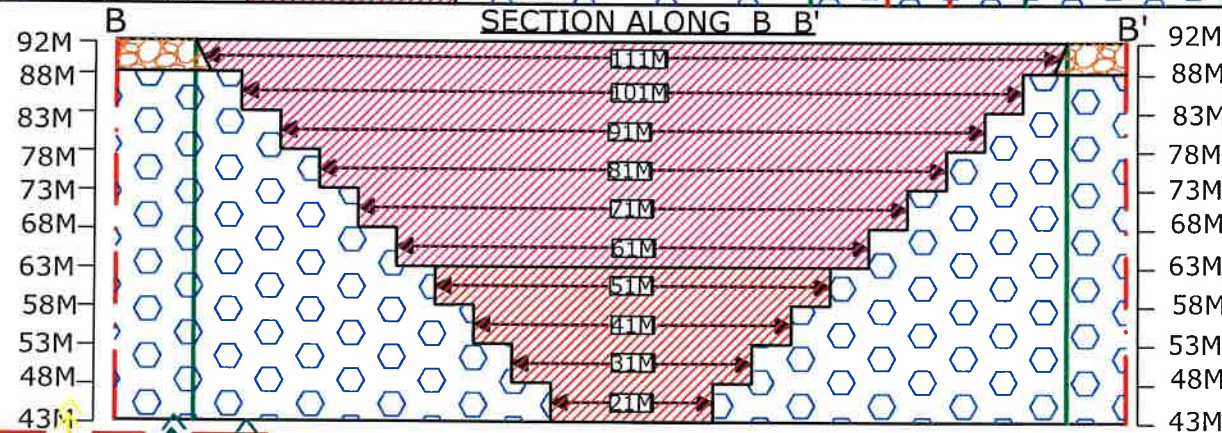
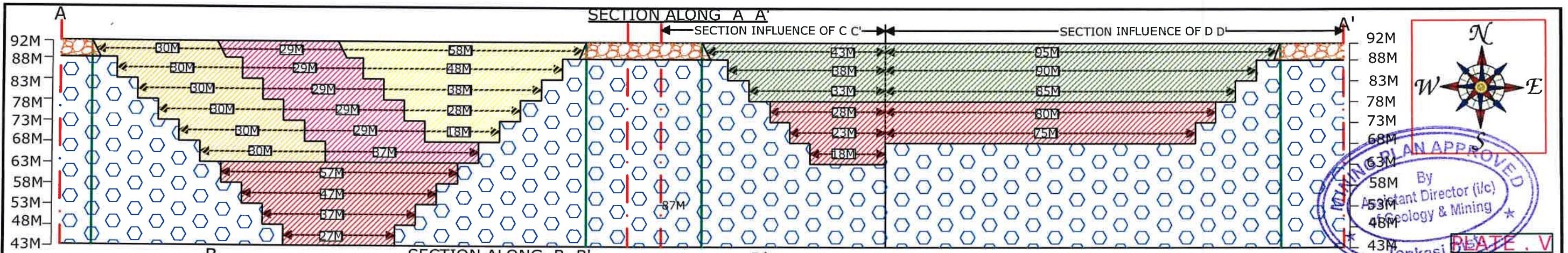
PLAN AND SECTION

SCALE :- PLAN 1:2000
SECTION 1:1000

PLANS AND SECTIONS ARE PREPARED BASED ON THE LEASE MAP AUTHENTICATED BY THE STATE GOVERNMENT.

T.S. GANESAN, M.Sc.,
RQP/MAS/142/2000/A

N.H.M Pandian



YEAR WISE PRODUCTION SCHEDULE

SECTION	LENGTH	WIDTH	DEPTH	CHORNOCKITE VOLUME M ³	GRAVEL VOLUME M ³
A A'B B'	58M	111M	4.0M	-	25,752
	48M	101M	5.0M	24,240	-
	38M	91M	5.0M	17,290	-
	28M	81M	5.0M	11,340	-
	18M	71M	5.0M	6,390	-
TOTAL EXCAVATION				59,260	25,752
A A'B B'	58M	111M	1.0M	-	6,438
ALREADY EXCAVATION				-	6,438
I-YEAR EXCAVATION				59,260	19,314
A A'B B'	29M	111M	4.0M	-	12,876
	29M	101M	5.0M	14,645	-
	29M	91M	5.0M	13,195	-
	29M	81M	5.0M	11,745	-
	29M	71M	5.0M	10,295	-
	37M	61M	5.0M	11,285	-
TOTAL EXCAVATION				61,165	12,876
A A'B B'	29M	111M	1.0M	-	3,219
ALREADY EXCAVATION				-	3,219
II-YEAR EXCAVATION				61,165	9,657
A A'B B'	30M	111M	4.0M	-	13,320
	30M	101M	5.0M	15,150	-
	30M	91M	5.0M	13,650	-
	30M	81M	5.0M	12,150	-
	30M	71M	5.0M	10,650	-
	30M	61M	5.0M	9,150	-
TOTAL EXCAVATION				60,750	13,320
A A'B B'	30M	111M	1.0M	-	3,330
	54M	12M	1.0M	-	648
ALREADY EXCAVATION				-	3,978
III-YEAR EXCAVATION				60,750	9,342
A A'C C'	43M	72M	4.0M	-	12,384
	38M	62M	5.0M	11,780	-
	33M	52M	5.0M	8,580	-
A A'D D'	95M	59M	4.0M	-	22,420
	90M	49M	5.0M	22,050	-
	85M	39M	5.0M	16,575	-
TOTAL EXCAVATION				58,985	34,804
A A'C C'	140M	54M	1.0M	-	7,560
A A'D D'	16M	10M	1.0M	-	160
ALREADY EXCAVATION				-	7,720
IV-YEAR EXCAVATION				58,985	27,084
A A'C C'	28M	42M	5.0M	5,880	-
	23M	32M	5.0M	3,680	-
	18M	22M	5.0M	1,980	-
A A'D D'	80M	29M	5.0M	11,600	-
	75M	19M	5.0M	7,125	-
A A'B B'	57M	51M	5.0M	14,535	-
	47M	41M	5.0M	9,635	-
	37M	31M	5.0M	5,735	-
	27M	21M	5.0M	2,835	-
V-YEAR EXCAVATION				63,005	-
TOTAL PRODUCTION				3,03,165	65,397

NAME OF THE APPLICANT:-

SHRI.N.H.M.PANDIAN,
S/O NAVANEETHAKRISHNA PANDIAN,
D.No.4/7,KURUNTHAN MOZHI,
KURUCHAMPATTI-POST,
VEERAKERALAMPUDUR-TALUK,
TENKASI- DISTRICT-627 860.

INDEX:-

LEASE APPLIED AREA	
SAFETY LINE	
TOP SOIL	
GRAVEL	
CHORNOCKITE	
BENCH MARK	
I-YEAR ECAVATION	
II-YEAR EXCAVATION	
III-YEAR EXCAVATION	
IV-YEAR EXCAVATION	
V-YEAR EXCAVATION	
EARTH BUND	
SITE SERVICES	

LAND USE CUM PRODUCTION PLAN AND SECTIONS

SCALE :- PLAN 1:2000
SECTION 1:1000

PLANS AND SECTIONS ARE PREPARED BASED ON THE LEASE MAP AUTHENTICATED BY THE STATE GOVERNMENT.

T.S. GANESAN, M.Sc.,
RQP/MAS/142/2000/A

AFFORESTATION PROGRAME

YEAR	No OF TREES	TYPE OF TREES
I-YEAR	300	NEEM/PUNGAI
II-YEAR	300	NEEM/VAGAI
III-YEAR	300	NEEM/PUVARSU
IV-YEAR	300	NEEM/SAVUKKU
V-YEAR	300	NEEM/PUNGAI

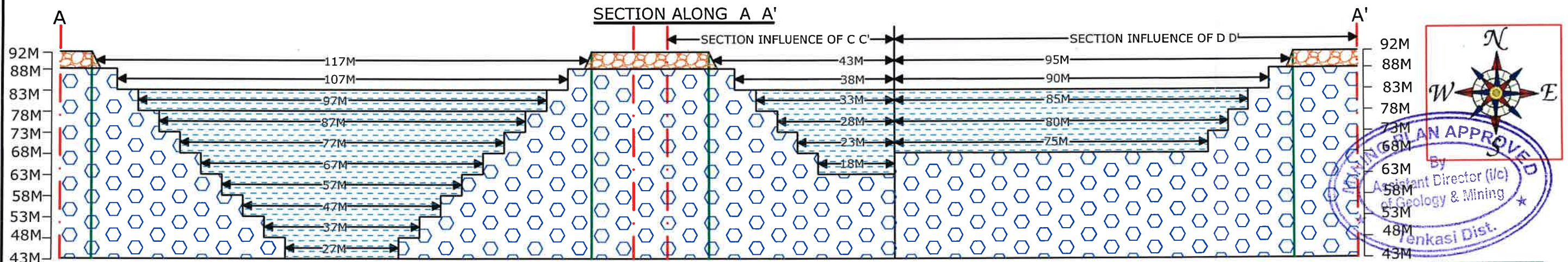
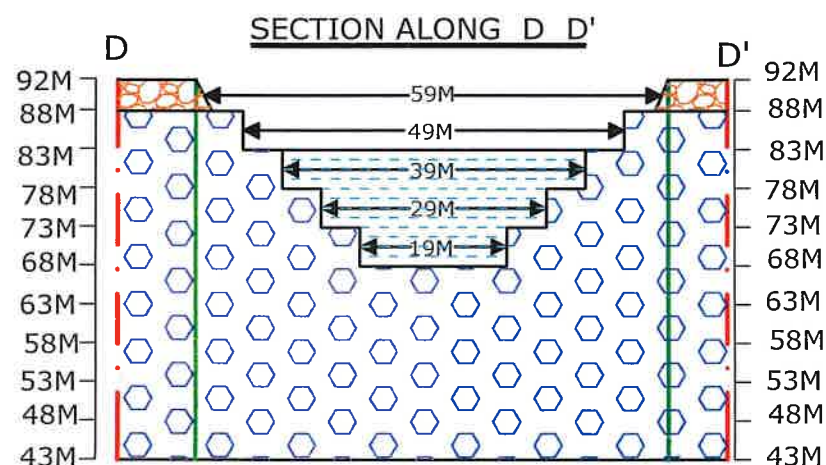
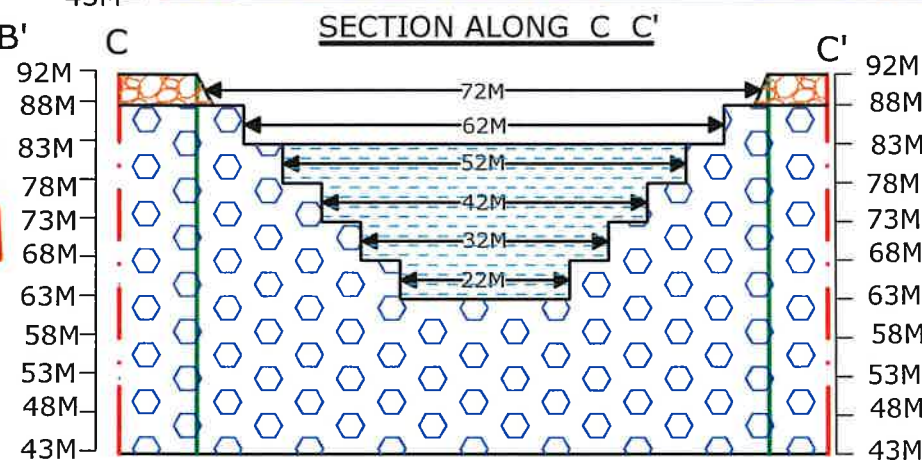
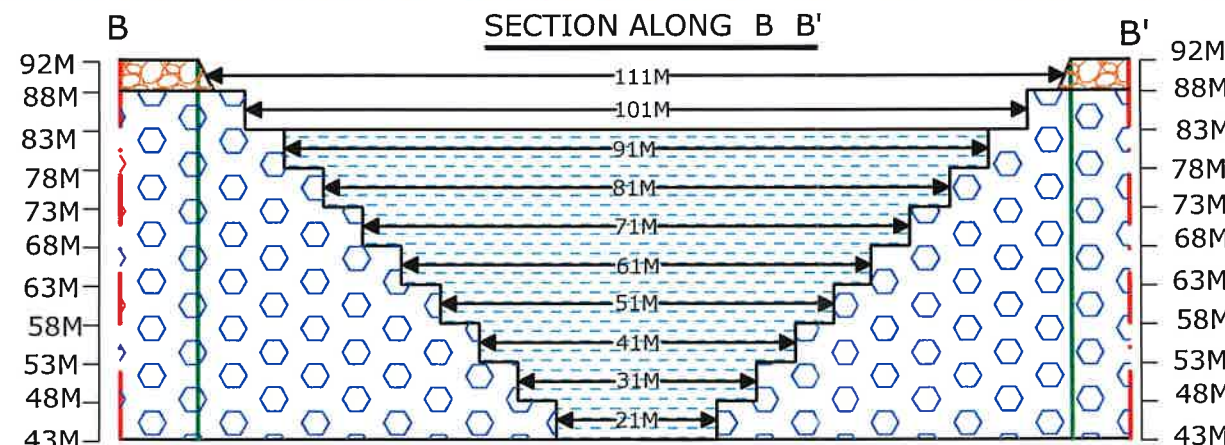


PLATE . VI



MINEABLE RESERVES					
SECTION	LENGTH	WIDTH	DEPTH	CHORNOCKITE VOLUME M ³	GRAVEL VOLUME M ³
A A'&B B'	117M	111M	4.0M	-	51,948
	107M	101M	5.0M	54,035	-
	97M	91M	5.0M	44,135	-
	87M	81M	5.0M	35,235	-
	77M	71M	5.0M	27,335	-
	67M	61M	5.0M	20,435	-
	57M	51M	5.0M	14,535	-
	47M	41M	5.0M	9,635	-
	37M	31M	5.0M	5,735	-
	27M	21M	5.0M	2,835	-
A A'&C C'	43M	72M	4.0M	-	12,384
	38M	62M	5.0M	11,780	-
	33M	52M	5.0M	8,580	-
	28M	42M	5.0M	5,880	-
	23M	32M	5.0M	3,680	-
A A'&D D'	18M	22M	5.0M	1,980	-
	95M	59M	4.0M	-	22,420
	90M	49M	5.0M	22,050	-
	85M	39M	5.0M	16,575	-
	80M	29M	5.0M	11,600	-
	75M	19M	5.0M	7,125	-
TOTAL MINEABLE RESERVES				3,03,165	86,752
ALREADY EXCAVATED				-	21,355
BALANCE MINEABLE RESERVES				3,03,165	65,397

ULTIMATE PIT SIZE

SECTION	LENGTH	WIDTH	DEPTH
A A'&B B'	117M	111M	49M
A A'&C C'	72M	43M	29M
A A'&D D'	95M	59M	24M

NAME OF THE APPLICANT:-

SHRI.N.H.M.PANDIAN,
S/O NAVANEETHAKRISHNA PANDIAN,
D.No.4/7,KURUNTHAN MOZHI,
KURUCHAMPATTI-POST,
VEERAKERALAMPUDUR-TALUK,
TENKASI- DISTRICT-627 860.

INDEX:-

LEASE APPLIED AREA	
SAFETY DISTANCE	
GRAVEL	
CHORNOCKITE	
BENCH MARK	
WATER RESERVOIR	
EARTH BUND	
PLANTATION	

**CONCEPTUAL
PLAN AND SECTION**

SCALE :- PLAN 1:2000
SECTION 1:1000

PLANS AND SECTIONS ARE PREPARED BASED ON THE LEASE
MAP AUTHENTICATED BY THE STATE GOVERNMENT.

T.S. GANESAN
T.S. GANESAN, M.Sc.,
RQP/MAS/142/2000/A



NAME OF THE APPLICANT:-

SHRI.N.H.M.PANDIAN,
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D.No.4/7,KURUNTHAN MOZHI,
KURUCHAMPATTI-POST,
VEERAKERALAMPUDUR-TALUK,
TENKASI- DISTRICT-627 860.

LOCATION OF THE APPLIED AREA:-

DISTRICT:TENKASI
TALUK : VERAKERALAMPUDUR
VILLAGE : ANAIKULAM
S.F.No. : 302/1,304/1A&304/2A
EXTENT : 3.01.00HECTARE

INDEX:-

APPLIED AREA



SAFETY DISTANCE



500M RADIUS



300M RADIUS



WIND DIRECTION



APPROCH ROAD



CRUSHER UNIT



ENVIRONMENTAL PLAN

SCALE -1:5000

PLANS AND SECTIONS ARE PREPARED BASED ON THE LEASE
MAP AUTHENTICATED BY THE STATE GOVERNMENT.

T.S. GANESAN
T.S. GANESAN, M.Sc.,
RQP/MAS/142/2000/A

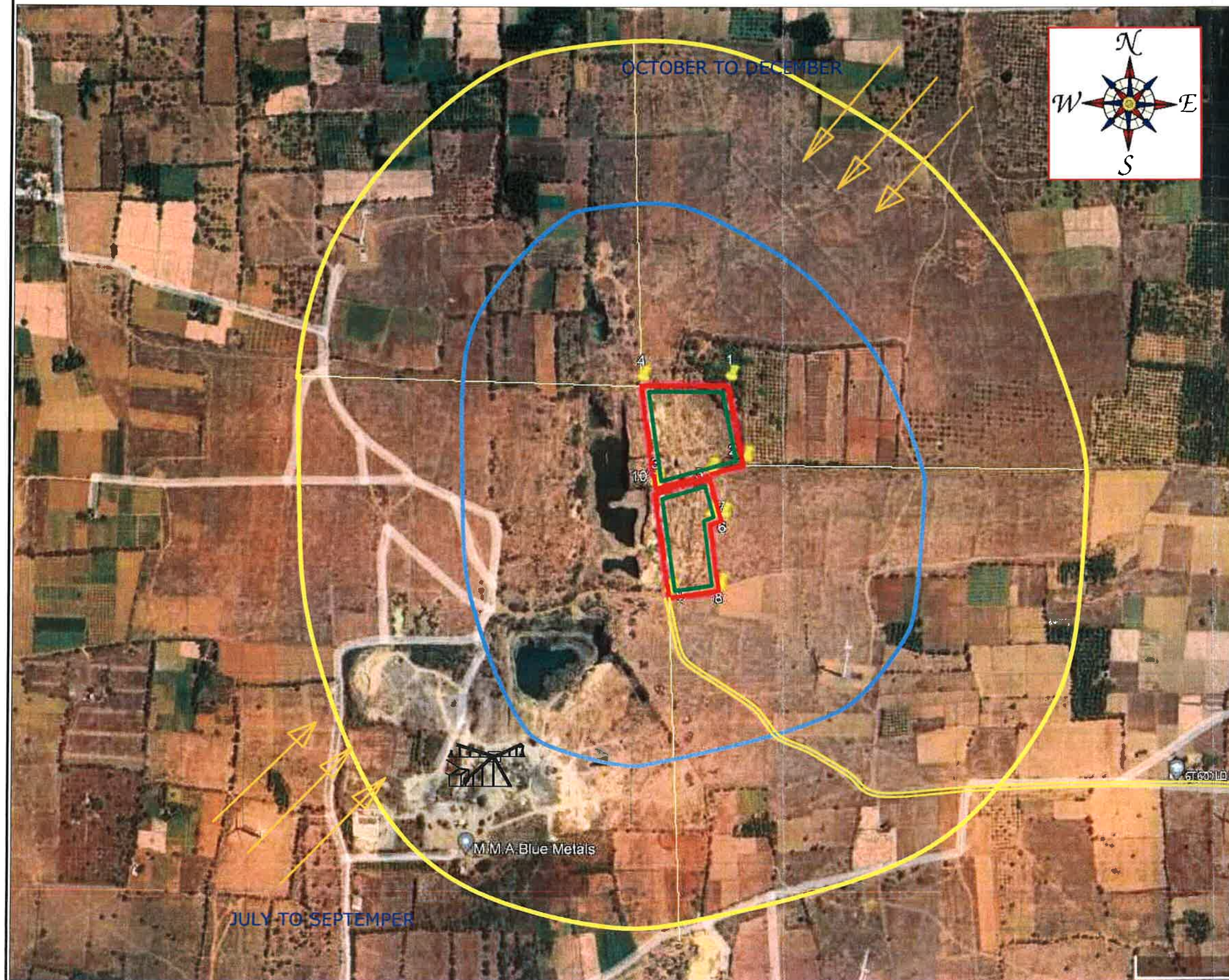
N.H.M. Pandian

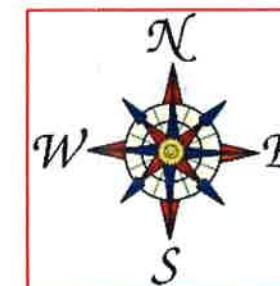
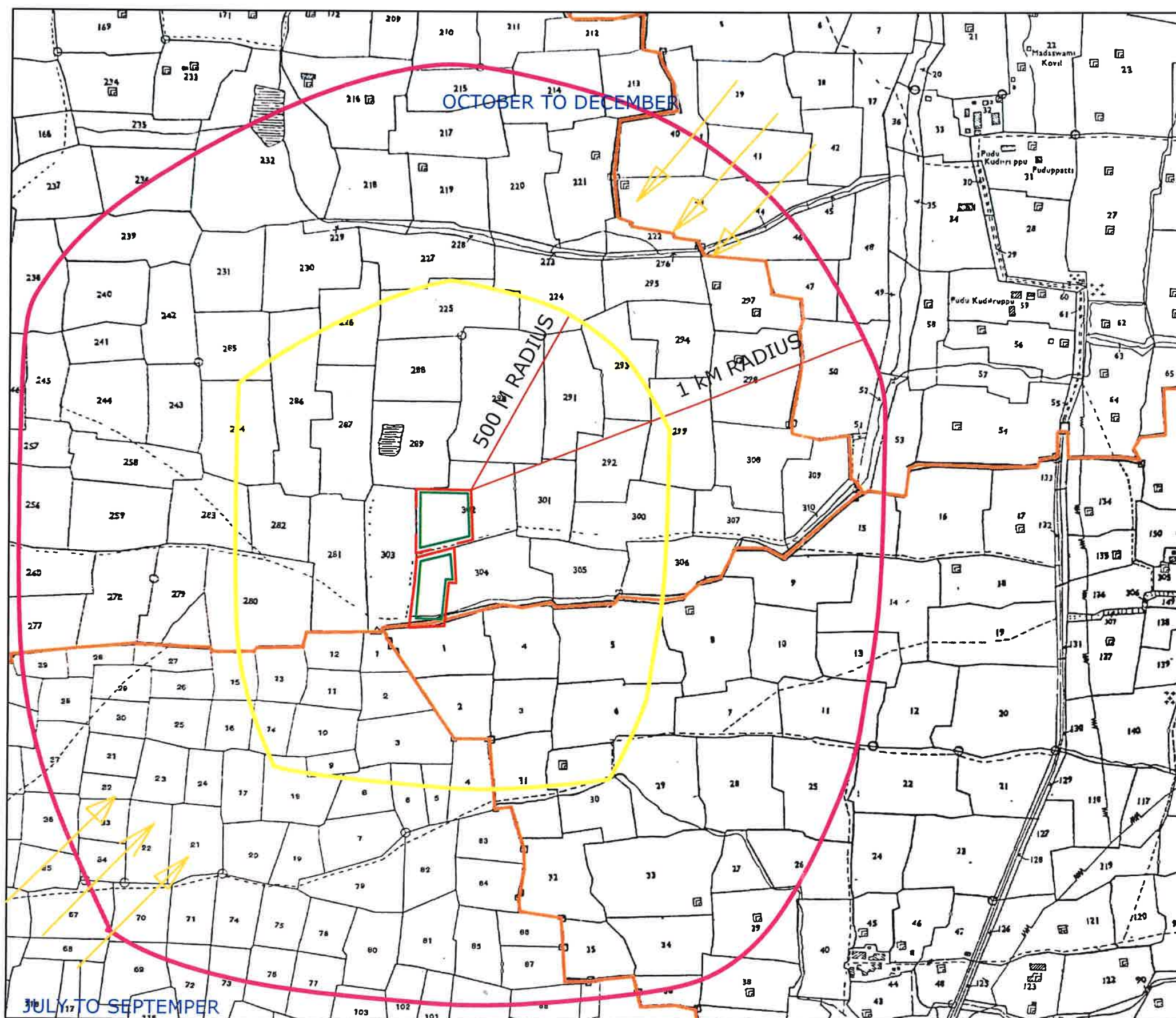
OCTOBER TO DECEMBER



JULY TO SEPTEMBER

M.M.A Blue Metals





NAME OF THE APPLICANT:-

SHRI.N.H.M.PANDIAN,
S/O NAVANEETHAKRISHNA PANDIAN,
D.No.4/7,KURUNTHAN MOZHI,
KURUCHAMPATTI-POST,
VEERAKERALAMPUDUR-TALUK,
TENKASI- DISTRICT-627 860.

LOCATION OF THE APPLIED AREA:-

DISTRICT:TENKASI
TALUK : VERAKERALAMPUDUR
VILLAGE : ANAIKULAM
S.F.No. : 302/1,304/1A&304/2A
EXTENT : 3.01.00HECTARE

INDEX:-

APPLIED AREA	
SAFETY LINE	
1 km RADIUS	
500 M RADIUS	
CART TRACK	
WIND DIRECTION	
ODAI	
WELL	
VILLAGE BOUNDARY	

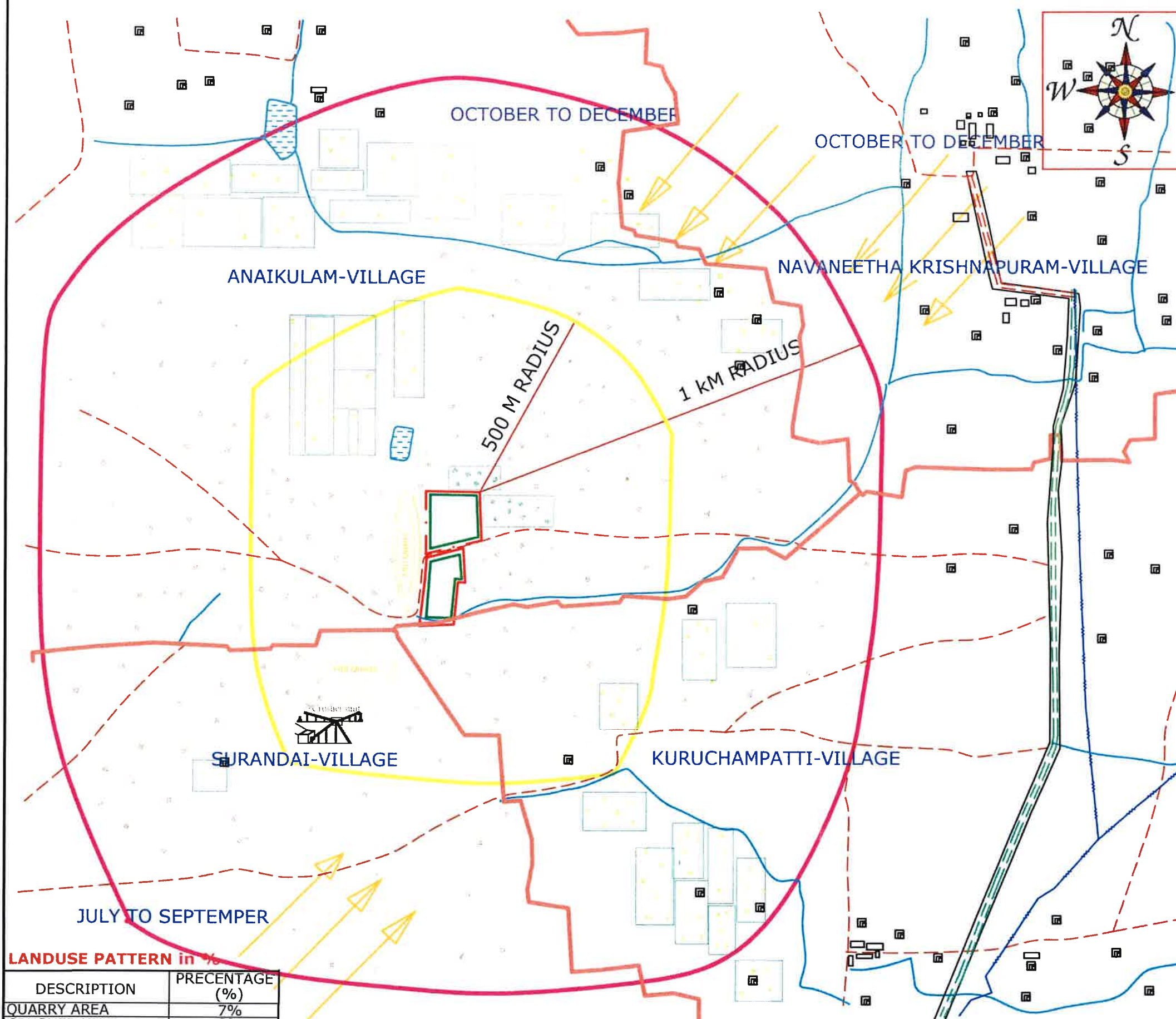
VILLAGE MAP SHOWING ENVIRONMENTAL FEATURES

SCALE:-1:10,000

ALL PLANS AND SECTIONS ARE PREPARED BASED ON THE
LEASE MAP AUTHENTICATED BY STATE GOVERNMENT

T.S. GANESAN, M.Sc.,
RQP/MAS/142/2000/A

N.H.M. Pandian



NAME OF THE APPLICANT:-

SHRI.N.H.M.PANDIAN,
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D.No.4/7,KURUNTHAN MOZHI,
KURUCHAMPATTI-POST,
VEERAKERALAMPUDUR-TALUK,
TENKASI- DISTRICT-627 860.



LOCATION OF THE APPLIED AREA:-

DISTRICT:TENKASI
TALUK :VERAKERALAMPUDUR
VILLAGE :ANAIKULAM
S.F.No. :302/1,304/1A&304/2A
EXTENT :3.01.00HECTARE

INDEX:-

APPLIED AREA	
SAFETY LINE	
1 KM RADIUS	
500 M RADIUS	
POWER LINE	
ROAD	
WIND DIRECTION	
ODAI	
POND	
VILLAGE BOUNDARY	
WELL	
CART TRACK	
POND	

**ENVIRONMENTAL AND
LAND USE PLAN**

SCALE:-1:10,000

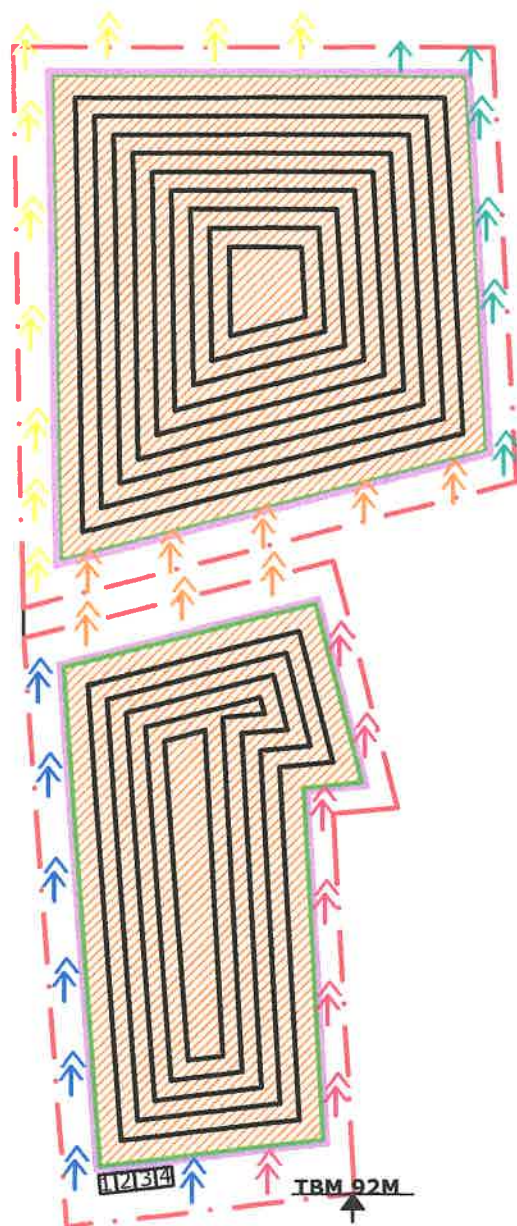
ALL PLANS AND SECTIONS ARE PREPARED BASED ON THE
LEASE MAP AUTHENTICATED BY STATE GOVERNMENT

LANDUSE PATTERN in %

DESCRIPTION	PERCENTAGE (%)
QUARRY AREA	7%
CRUSHER UNIT	2%
ROADS/CART TRACK	7%
GREEN BELT	4%
ODAI/URANI	8%
DRY LANDS	38%
SEASONAL CROPS	34%

T.S. GANESAN, M.Sc.,
RQP/MAS/142/2000/A

N.H.M. Pandian



ULTIMATE PIT SIZE

SECTION	LENGTH	WIDTH	DEPTH
A A'&B B'	117M	111M	49M
A A'& C C'	72M	43M	29M
A A'&D D'	95M	59M	24M

AFFORESTATION PROGRAMME

YEAR	No OF TREES	TYPE OF TREES
I-YEAR	300	NEEM/PUNGAI
II-YEAR	300	NEEM/VAGAI
III-YEAR	300	NEEM/PUVARSU
IV-YEAR	300	NEEM/SAVUKKU
V-YEAR	300	NEEM/PUNGAI

MINE CLOSURE PLAN WITH LAND USE PATTERN

MINING / EXCAVATION	=	0.00.0Ha
FUTURE MINING	=	2.14.7 Ha
INFRASTRUCTURE	=	0.01.0 Ha
STORAGE OF TOP SOIL	=	0.00.0 Ha
STOCKING & MINERAL DRESSING YARD	=	0.00.0 Ha
MINE ROAD	=	0.03.0 Ha
AFFORESTATION&SAFETY	=	0.82.3 Ha
UNDISTURBED AREA	=	0.00.0 Ha
TOTAL	=	3.01.0 Ha



PLATE . VIII

NAME OF THE APPLICANT:-

SHRI.N.H.M.PANDIAN,
S/O NAVANEETHAKRISHNA PANDIAN,
D.No.4/7,KURUNTHAN MOZHI,
KURUCHAMPATTI-POST,
VEERAKERALAMPUDUR-TALUK,
TENKASI- DISTRICT-627 860.

LEGEND

LEASE BOUNDARY

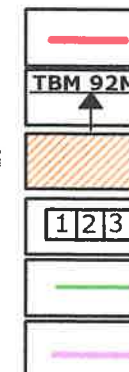
TEMPORARY BENCH MARK

LAYOUT OF MINE WORKING

PROPOSED SITE SERVICES

SAFETY DISTANCE

EARTH BUND



PROGRESSIVE MINE CLOSURE PLAN

SCALE 1:2,000

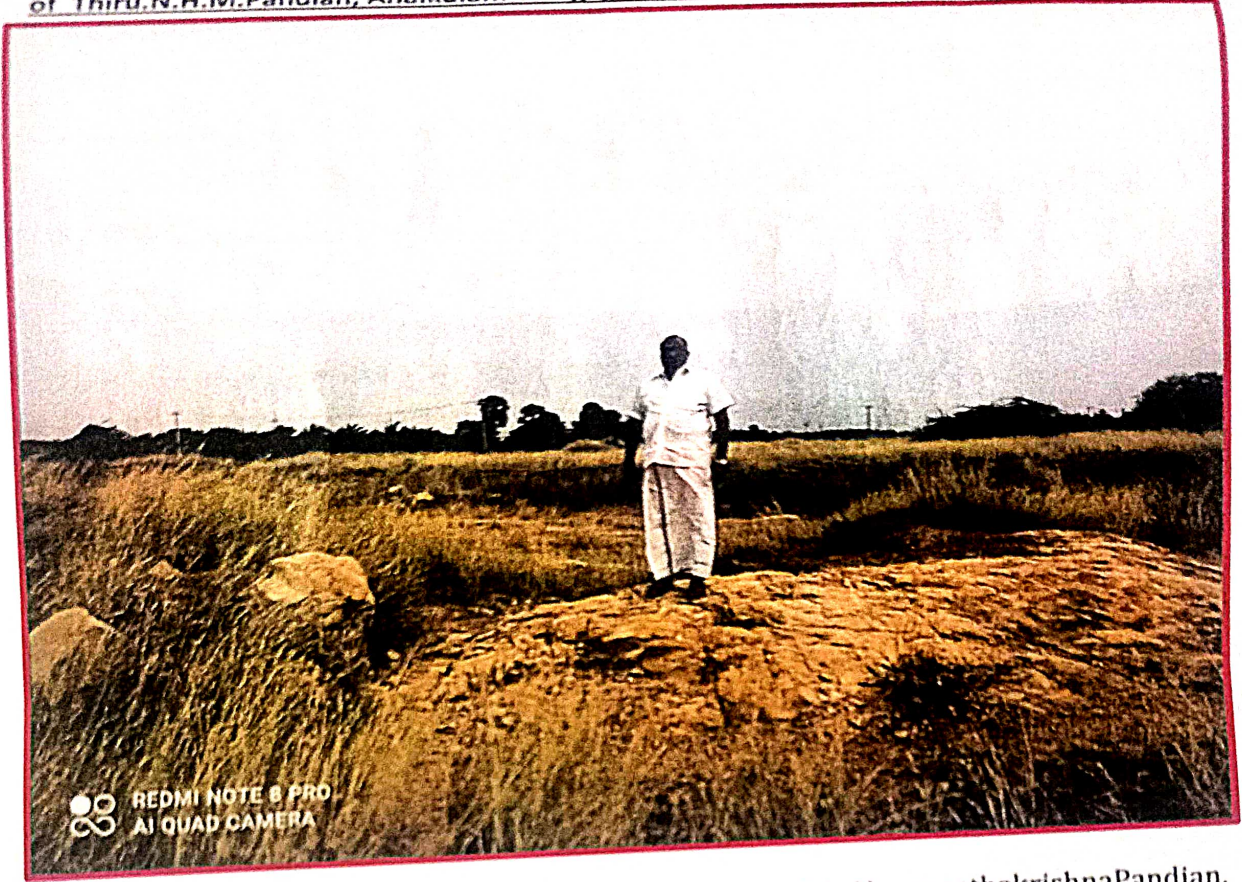
PLANS AND SECTIONS ARE PREPARED BASED ON
THE LEASE MAP AUTHENTICATED BY THE STATE
GOVERNMENT.

T.S. Ganesan
T.S. GANESAN, M.Sc.,
RQP/MAS/142/2000/A

N.H.M. Pandian

ANNEXURE-VII
VAO CERTIFICATE

TOPOGRAPHICAL VIEW OF THE PROPOSED ROUGH STONE & GRAVEL QUARRY SITE
of Thiru.N.H.M.Pandian, Anaikulam Village, VeeraKeralamPudur Taluk, Tenkasi District.



Name of the Applicant : Thiru. N.H.M.Pandian, S/o.NavaneethakrishnaPandian,
Address of applicant : D.No.4/7, Kurunthan Mozhi,
Kuruchampatti Post,
VeeraKeralampudur Taluk,
Tenkasi District- 627 860.

LOCATION DETAILS:

Extent : 3.01.00 Hectares
Survey Nos. : 302/1, 304/1A and 304/2A
Village : Anaikulam
Taluk : VeeraKeralamPudur
District : Tenkasi
State : Tamil Nadu.

Signature with seal
Village Administrative Officer
கிராம நிர்வாக அலுவலர்
கூகனகுளம் கிராமம்
வீரகேரளம்புதூர் வட்டம்

N.H.M. Pandian
Signature of the Applicant

அந்தஸ்து மாவட்டம், V.R. புதூர் வட்டம், அனாத்தூர்
 கிராமம், H.C.H. அனாத்தூர் 876, 1412 in சிவசு அனாத்தூர்
 302/1, 304/1A, 304/2A. பூங்கா குடியே 1.70.5, 054.0
 0.76.5 அனாத்தூர். 3.01.0 அனாத்தூர் நகராட்சி அலுவலர்
 லெண்ட் N.H.M. வாரியாரின் அனாத்தூர் அலுவலர் சிவசு அனாத்தூர்
 லெண்ட் சிவசு அனாத்தூர் அலுவலர் அனாத்தூர் அலுவலர்.

லெண்ட் Y.N. அனாத்தூர் அலுவலர் அனாத்தூர்
 அனாத்தூர் அலுவலர், அனாத்தூர், அனாத்தூர் அலுவலர்
 அனாத்தூர் அலுவலர் அனாத்தூர் அலுவலர் அனாத்தூர்
 அனாத்தூர் அலுவலர் அனாத்தூர் அலுவலர் அனாத்தூர்

கிராம நிர்வாக அலுவலர்
 அனாத்தூர் கிராமம்
 வீரகேசரம் புதூர் வட்டம்
 18/07/23

ANNEXURE-VIII
BLASTING DOCUMENT
& AGREEMENT

Sri Ramajayam

KK EXPLOSIVES

423, T, Madurai Main Road,
Thalayuthu, Sankar Nagar,
Tirunelveli - 627 357, Tamil Nadu.

GSTIN : 33ALFPK2501A1Z2

Ph : 0462 - 2301318, Mobile: 94431 67374

Licence No. : E / SC / TN / 22 / 402 / E 21905 in Form 22
E / HQ / TN / 22 / 338 / E 69859 in Form 22
E / HQ / TN / 21 / 1497 / E 32621 in Form 21

Magazine at : SF No. 1079, Thenkulam Village

H.O : KK PNEUMATIC Co.,

182/3, S.N. High Road, Tirunelveli - 627 001.



Ref: To

Date : 16.07.2023

Mr.N.H.M.Pandian,
S/o,NaveethaKrishnan Pandian,
4/7,Kurunthan Mazhi,
Kuruchanpatti Post,
Veerakeralampudur-Taluk,
Tenkasi Dist-627 860.

Sir

Sub:- Regarding Blasting Work using Explosives in your existing quarry
Ref: - Your letter dt 16.07.23

We are having explosives licence Nos E/SC/TN/22/402/E21905 and E/HQ/TN/22/338/E69859 and E/SC/TN/22/681/E96022 situate in SF NO 1079 Thenkulam Village, Manur Taluk, Tirunelveli District. Our Office Functioning at 423T, Madurai Main Road, Sankarnagar, Thalayuthu, Tirunelveli-627 357

We are enacting 2 explosives vans for transporting detonator and class 2 explosives separately for our magazine to work site and well experienced and licenced Blaster and Shotfirer for safe blasting work since 16 years

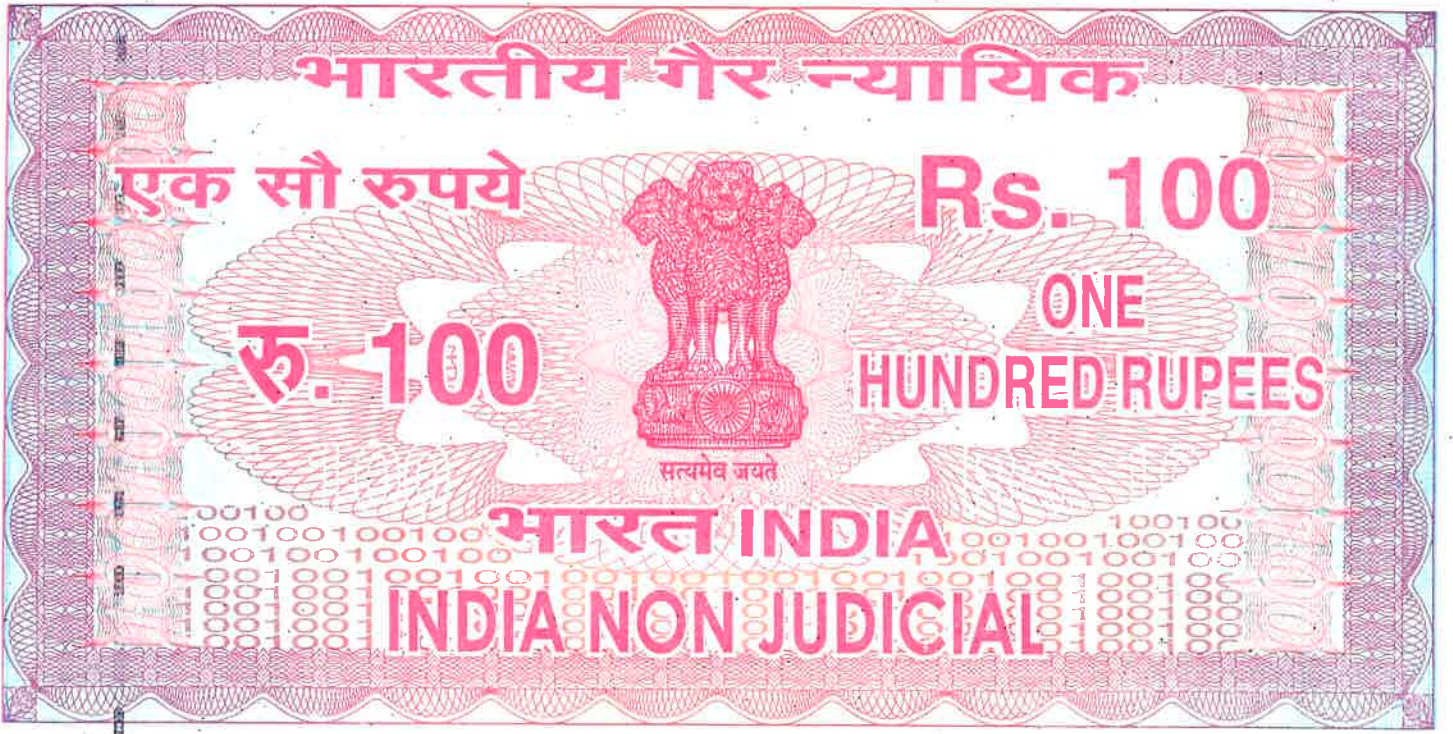
We are willing undertake blasting work on contract basis at your SF Nos.302/1,304/1A & 304/2A -over an area 3.01.0 Hect. Anaikulam Village Veerakeralampudur Taluk, Tenkasi District.

Thanking You



Yours Faithfully,
For KK Explosives,

N.H.M. Pandian



தமிழ்நாடு தமில்நாடு TAMILNADU

17 JUL 2023
100

N.H.M. Pandian
Surandai

CK 464761
P. ஜோசப் P. ராயன்
முத்திரைத்தாள் விற்பனையாளர்
74, மதுரை ரோடு, திருநெல்வேலி
உரிமம் எண்: 3 of 1997

DEED OF AGREEMENT OF CONDUCT BLASTING OPERATION

This agreement on the day of License to be granted Thiru.N.H.M. Pandian, S/o.Navaneethakrishna Pandian residing at No.4/7,Kurunthan Mozhi,Kuruchanpatti Post, , Veerakeralampudur Taluk , Tenkasi District - 627 860.

hereinafter referred to as First Party the owner of Proposed granted Quarry and Thiru. K.KAMARAJ, No.1079, Thenkalam Village, Manur Taluk, Tirunelveli District, License of Sri.K.K.Explosives, (E/SC/TN/22/402/E21905 PARTY and From 22 (hereinafter called as Dealer of explosives) Second Party

N.H.M. Pandian
(N.H.M.Pandian)
First Party

K.KAMARAJ
(K.KAMARAJ)
Second Party

Where as the owner of the Quarry having License to be granted for SF.No 302/1,304/1A & 304/2A over an area 3.01.0 Ha. in Anaikulam Village, Veerakeralampudur Taluk , Tenkasi District.

And where as the dealer of Explosives have agree to carry out the blasting operation in skillful scientific shot firer till the valid date.

Where as the party of the second part has decided to entrust the work of conducting blasting in his / their quarry work to the party of the first part on contract basis as per mutually agreed terms and conditions.

Where as the Second party is responsible for blasting operations and also making his own arrangement for the explosives and exploding machines / equipments required for the work. The entire blasting equipment will be handled by the Second Party having valid license and short firer permits under the explosives Rules, 2008, issued by the department of Explosive and hereby undertake the responsibility for the work entrusted.

Where as payment will be made periodically by the party of the second party for the quantity of Explosives used and hours and time of the exploding equipments put into use calculations will be made and element will be arrived at on completion of blasting operations.


(N.H.M.Pandian)
First Party


(K.KAMARAJ)
Second Party

Witnesses

1. T. S. Suresh "Thiruvalluvar" Isthree/-
Thiruvalli Town
Thiruvalli - 627 006

अनुज्ञप्ति प्ररूप एल. ई.-3 | LICENCE FORM LE-3

(विस्फोटक नियम, 2008 की अनुसूची 4 के भाग 1 के अनुच्छेद 3(क) से (घ) देखिए।)
(See article 3(a) to (d) of Part I of Schedule IV of Explosives Rules, 2008)

(ग) उपयोग के लिए एक समय पर वर्ग 1,2,3,4,5 या वर्ग 7 के विस्फोटक या किसी मैगजीन में वर्ग 6 के विस्फोटक रखने के लिए अनुज्ञप्ति
Licence to possess : (c) for use,explosives of class 1, 2,3,4,5,6 or 7 in a magazine

अनुज्ञप्ति सं. (Licence No.) : E/SC/TN/22/402(E21905)

वार्षिक फीस रुपए (Annual Fee Rs): 9800/-

1. Licence is hereby granted to

M/s. K.K.Explosives (अधिभोगी / Occupier : K. Kamaraj~), M/s. K.K.Explosives, No.423,T.Madurai Main Road, Thalayuthu, Sankar Nagar, Town/Village - THALAYUTHU, District-THIRUNELVELI, State-Tamil Nadu, Pincode - 627357



को अनुज्ञप्ति अनुदत्त की जाती है।

2. अनुज्ञप्तिधारी की प्रास्थिति | Status of licensee : **Partnership Firm**

3. अनुज्ञप्ति निम्नलिखित प्रयोजनों के लिए विधिमाम्य है।

Licence is valid only for the following purpose.

possess for use of **Slurry Explosives, Safety Fuse, Detonating Fuse, Detonators, - के उपयोग के लिए**

4. अनुज्ञप्ति विस्फोटकों के निम्नलिखित किस्मों, प्रकार और मात्रा के लिए विधिमाम्य है।

Licence is valid for the following kinds and quantity of explosives: -- (क) (a)

क्र. Sr. No.	नाम और विवरण Name and Description	वर्ग और प्रभाग Class & Division	उप-प्रभाग Sub-division	मात्रा किसी एक समय में Quantity at any one time
1.	Slurry Explosives	2,0	0	4000 Kg.
2.	Safety Fuse	6,1	0	20000 Mtrs
3.	Detonating Fuse	6,2	0	30000 Mtrs
4.	Detonators	6,3	0	44000 Nos.

(ख) किसी एक कैलेंडर मास में खरीदे जाने वाले विस्फोटक की मात्रा [अनुच्छेद 3(ख) और (ग) के अधीन अनुज्ञप्ति के लिए]

(b) Quantity of explosives to be purchased in a calendar month[applicable for licence under article 3(b) and (c)] :

18 times as above.

5. निम्नलिखित रेखाचित्र (रेखाचित्रों) से अनुज्ञप्त परिसर की पुष्टि होती है।

रेखाचित्र क्र. (Drawing No.) E/SC/TN/22/402(E21905)

The licensed premises shall conform to the following drawing(s):

दिनांक (Dated) 04/07/2023

6. अनुज्ञप्ति परिसर निम्नलिखित पते पर स्थित हैं। The licensed premises are situated at following address:

Survey No(s). 1079 , ग्राम (Town/Village) : **Thenkulam**

पुलिस थाना (Police Station) : **Manur**

जिला (District)

THIRUNELVELI

राज्य (State)

Tamil Nadu

दूरभाष (Phone)

ई-मेल (E-Mail)

पिनकोड (Pincode)

फैक्स (Fax)

7. अनुज्ञप्ति परिसर में निम्नलिखित सुविधाएं अंतर्विष्ट हैं।

The licensed premises consist of following facilities.

: **A magazine with lobby and a Detonator room**

8. अनुज्ञप्ति समय - समय पर यथासंशोधित विस्फोटक अधिनियम, 1884 और उनके अधीन विरचित विस्फोटक नियम, 2004 के उपबंधों, शर्तों और अतिरिक्त शर्तों और निम्नलिखित उपाबद्धों के अधीन रहते हुए अनुदत्त की जाती है।

The licence is granted subject to the provision of Explosives Act 1884 as amended from time to time and the Explosives Rules, 2008 framed there under and the conditions, additional conditions and the following Annexures.

1. उपर्युक्त क्रम सं. 5 में यथा कथित रेखाचित्र (स्थान, सन्निर्माण संबंधी और अन्य विवरण दर्शित करते हुए)।

Drawings (showing site, constructional and other details) as stated in serial No. 5 above.

2. अनुज्ञप्ति प्राधिकारी द्वारा हस्ताक्षरित इस अनुज्ञप्ति की शर्तों और अतिरिक्त शर्तों।

Conditions and Additional Conditions of this licence signed by the licensing authority.

3. दूरी प्ररूप DE-2 | Distance Form DE-2.

9. यह अनुज्ञप्ति तारीख 31 मार्च 2008 तक विधिमाम्य रहेगी। This licence shall remain valid till 31st day of March 2008.

यह अनुज्ञप्ति, अधिनियम या उसके अधीन विरचित नियमों या अनुसूची V के भाग 4 के प्रति निर्दिष्ट सेट-VII के अधीन तथा उपवर्णित इस अनुज्ञप्ति की शर्तों का अधिक्रमण करने या यदि अनुज्ञप्त परिसर योजना या उससे संलग्न उपबंध में दर्शित विवरण के अनुरूप नहीं पाए जाने पर निलंबित या प्रतिसंहत की जा सकती है, जहां वह लागू हो।

This licence is liable to be suspended or revoked for any violation of the Act or Rules framed there under or the conditions of this licence as set forth under Set VIII, wherever applicable, referred to in Part 4 of Schedule V or if the licensed premises are not found conforming to the description shown in the plans and Annexure attached hereto.

तारीख | The Date - 01/02/2025

संयुक्त मुख्य विस्फोटक नियंत्रक | Joint Chief Controller of Explosives
South Circle, Chennai

Amendments :

- Change in Postal Address dated : 28/01/2010
- Amendment of Quantity of Explosives/Monthly Purchase Limit dated : 25/03/2011
- Amendment of Quantity of Explosives/Monthly Purchase Limit dated : 23/08/2012
- Change in Postal Address dated : 17/10/2012
- Amendment of Quantity of Explosives/Monthly Purchase Limit dated : 04/07/2023

Transfers :

- Change in Licensee Name/Address/Status dated : 09/02/2018

नवीनीकरण के पृष्ठानक के लिए स्थान
Space for Endorsement of Renewal

नवीकरण की तारीख Date of Renewal	समाप्ति की तारीख Date of Expiry	अनुज्ञापन प्राधिकारी के हस्ताक्षर और स्टाम्प Signature of licensing authority and stamp
02/03/2020	31/03/2025	Sd/- Jt. Chief Controller of Explosives, South Circle, Chennai

कानूनी चेतावनी : विस्फोटकों को गलत ढंग से चलाने या उनका दुरुपयोग विधि के अधीन गंभीर दंडिक अपराध होगा।
Statutory Warning : Mishandling and misuse of explosives shall constitute serious criminal offence under the law.

N. H. M. Poochan

Licence Endored under Rule 107(3) of Explosives Rules, 2008
By Shri C Shanmugam, Deputy Chief Controller of Explosives, Chennai on 28/01/2010

अनुमति प्रारूप एनई - 7 / LICENCE FORM LE-7
(विस्फोटक नियम 2008 की अनुसूची 4 के भाग 1 का अनुच्छेद 7 देखें)
(See article no 7 of Part 1 of Schedule IV of Explosives Rules, 2008)

अनुमति : सड़क वैन में विस्फोटकों के परिवहन के लिए
Licence to : transport explosives in a road van

अनुमति संख्या / Licence No. : E/SC/TN/25/567(E51794)
वार्षिक फीस रूप / Annual Fee Rs : 2500/-



- अनुमति एतद्वारा जारी की जाती है
Licence is hereby granted to : Shri K.KAMARAJ M.A.K.K. Explosives (Occupier : Shri K.Kamaraj)
16, Yathavar East Street, Palayamkottai-627002, Tirunelveli District,
District-THIRUNELVELI, State-Tamil Nadu, Pincode-627002
- अनुमतिधारी की प्रस्थिति / Status of licensee : Individual
- सड़क वैन की विशेषियाँ / Particulars of the road van:

पंजीकरण संख्या / Registration No.

यान का मेक एवं मॉडल / Make and model of vehicle

लदान रहित वजन / Unladen weight

लदान सहित अधिकतम वजन / Maximum laden weight

परिवहन के लिए अनुमति विस्फोटकों की अधिकतम मात्रा
Maximum quantity of explosives permitted for transport

इंजिन संख्या / Engine No.

चैसिस संख्या / Chassis No.

अन्य फिटिंग्स का विवरण / Description of Other Fittings

वाहन के लिए अनुमति विस्फोटकों की मात्रा / Quantity of Explosives permitted to carry

TN 72 AD 0099

TATA-SFC-407 TWIN TYRE

2420 Kg(s)

5300 Kg(s)

2880 Kg(s)

497 SPIC 35 HQZ 833041

MAT 357 176 98 NH 24242

Spark Arrestor, Fire Extinguisher,

Battery cut off switch

2880 Kg(s)

- अनुमति परिसर निम्नलिखित आरेखण (आरेखणों) के अनुरूप होना चाहिए / The licensed premises shall conform to the following drawing(s):
आरेखण संख्या / Drawing No : E/SC/TN/25/567(E51794) दिनांक / dated : 28/01/2010

- समय समय पर यथा संशोधित विस्फोटक अधिनियम, 1884 और उसके अधीन बनाए गए विस्फोटक नियम, 2008 के उपबन्धों और शर्तों एवं निम्नलिखित अनुमतिधारी के अधीन अनुमति प्रदान की जाती है।
The licence is granted subject to the provision of Explosives Act 1884 as amended from time to time and the Explosives Rules, 2008 framed thereunder and the conditions and the following annexures....
(क) उपर्युक्त क्रम संख्या 4 में यथाकथित सड़क वैन का आरेखण / (a) Drawings of the road van as stated in serial no.4 above.
(ख) अनुमति प्राधिकारी द्वारा हस्ताक्षरित शर्तें / (b) Conditions signed by the licensing authority.

- यह अनुमति तारीख 31 मार्च 2014 तक विधिमान्य रहेगी / This licence shall remain valid till 31st day of March 2014

यह अनुमति अधिनियम या उसके अधीन विरचित नियमों या इस अनुमति की शर्तों के उल्लंघन, अनुसूची 5 के भाग 4 में सन्दर्भित, जहाँ भी लागू हो, या यदि अनुमति परिसर आरेखण या उससे संलग्न उपायद्वों में दर्शाए गए विवरण के अनुरूप नहीं पाए जाने पर निलम्बित या प्रतिसंवत की जा सकती है।
This licence is liable to be suspended or revoked for any violation of the Act or rules framed there under or the conditions of this licence as set forth under, wherever applicable, referred to in Part 4 of Schedule V or if the licensed premises are not found conforming to the description shown in the plans and annexure attached hereto.

दिनांक / Date: 28/01/2010

अनुमति के नवीनीकरण हेतु पंजीकन / Endorsement for renewal of licence

संयुक्त मुख्य विस्फोटक नियंत्रक / Joint Chief Controller of Explosives
दक्षिणचल, चेन्नई / South Circle, Chennai

नवीनीकरण की तिथि
Date of Renewal

वैधता समाप्ति की तिथि
Date of Expiry

अनुमति प्राधिकारी के हस्ताक्षर
Signature of licensing authority

30/01/2019

31/03/2024

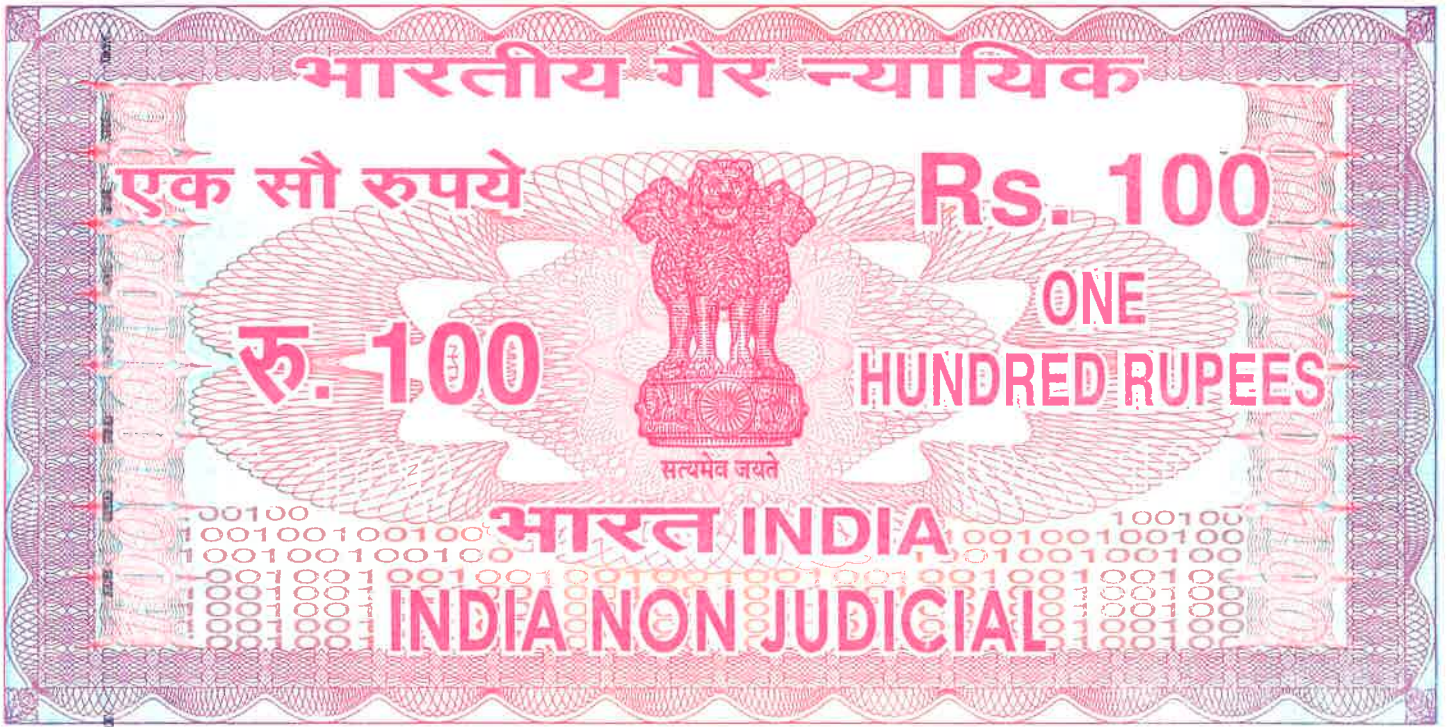
Jt. Chief Controller of Explosives, South Circle, Chennai

[Signature]

वैधानिक चेतावनी : विस्फोटकों का लापरवाही से प्रयोग या दुरुपयोग, विधि के अधीन गम्भीर दण्डित अपराध होगा।
Statutory Warning : Mishandling and misuse of explosives shall constitute serious criminal offence under the law.

ANNEXURE-IX

AFFIDAVIT AND CER DETAILS



தமிழ்நாடு தமில்நாடு TAMILNADU

17 JUL 2023

N.H.M. Pandian
Surandai

CK 464760

P. ஜோசப் P. ராயன்
முத்திரைத்தாள் விற்பனையாளர்
74, மதுரை ரோடு திருநெல்வேலி-1
உரிம எண்: 3 01 1997

AFFIDAVIT to SEIAA, Tamil Nadu

I N.H.M.Pandiyar, S/o.NavaneethaKrishnaPandian residing at No.4/7, Kurunthan Mozhi village, Kuruchampatti Post, VeeraKeralampudur Taluk, Tenkasi District, solemnly declare and sincerely affirm that:

I have applied for Prior Environment Clearance to SEIAA, Tamil Nadu for quarry lease for quarrying of **Rough stone and Gravel quarry over an extent of 3.01.0 hectares of pattta Land at S.F.Nos. 302/1, 304/1 & 304/2A of Annikulam village, VeeraKeralampudur Taluk, Tenkasi District, Tamil Nadu State.**

1. I swear to state and confirm that within 10km radius of the quarry site, none of the following is situated
 - a. Protected Areas notified under the Wild life (Protection) Act, 1972.
 - b. Critically polluted areas as notified by the Central Pollution Control Board constituted under Water (Prevention and Control of Pollution) Act, 1974
 - c. Eco-Sensitive areas as notified.



N.H.M. Pandian

:2:

2. I will ensure to take up the following Corporate Environment Responsibility (CER) activities as per OM of MoEF & CC dated 01.05.2018

CER Activity		Project Cost (Rs. in Lakh)	CER Cost (Rs in Lakh)
Providing necessary facilities to Panchayat Union Elementary school, Anaikulam village.		128.68	5.00
Provisions	Amount		
1. LCD Smart Board to the school.	Rs. 2,00,000/-		
2. Wall painting materials	Rs. 50,000/-		
3. Environmental awareness related books for library.	Rs. 1,50,000/-		
4. Greenbelt development in and around the periphery of campus	Rs. 50,000/-		
5. Adequate toilets for the students	Rs. 50,000/-		
Total	Rs. 5,00,000/-		
Total Cost Allocation		128.68	5.00

3. List of quarries within 500m radius from the periphery of the proposal

S.No.	Name of the Lessee	Village & S.F No.	Extent (Ha)	Lease Status
a. Details of Abandoned Quarries				
NIL				
b. Details of Expired Quarries				
NIL				
c. Details of Existing Quarries				
1	Thiru,M.Abdul Ali, S/o.Mohammed Sharffudhin, No.8,Moonushuzhi Road Vadakarai Village, Shenkottai Taluk, Tenkasi District.	S.F.Nos. 1, 2, 11/2 & 12, Surandai Part-1 (V)	4.00.00	Lease Peiod : 27.03.2023 to 26.03.2024
2	Thiru.D.Sankaranarayanan S/o.Durai Raj, 9-7-7/1, Bus Stand Road, Surandai, VeerakeralamPudur Taluk, Tenkasi District.	SF.Nos. 279/3A(P) & 279/4(P), Anaikulam (V)	0.98.50	Lease Period: 10.10.2022 to 09.10.2027
d. Details of Present Proposed Quarries				
1.	N.H.M.Pandian, S/o.NavaneethakrishnaPandian 4/7, Kurunthan Mozhi, VeerakeralamPudur Taluk, Tenkasi District.	SF.Nos.302/1 304/1A & 304/2, Anaikulam (V)	3.01.00	Present Proposed
Total			7.99.50	



N.H.M. Pandian

: 3 :

4. There will not be any hindrance or disturbance to the people during transportation. No villages are present enroute during transportation
5. There are no approved habitations within 300m radius from the periphery of the quarry
6. I swear that Greenbelt development will be carried out during the course of quarrying operation and maintained
7. The required insurance will be taken in the name of the labourers working in the quarry site
8. I will not engage any child labour in our quarry will be provided to all the laborers working in my quarry
9. I will not engage any child labour for any kind of quarry works
10. All types of safety / Personal protective equipment will be provided to all the labourers working in the quarry
11. There is no permanent structure located within 300m radius from the periphery of the quarry

I ensure to do all the social and Environment commitment as mentioned in the Mining Plan to the best of my knowledge.

N.H.M. Pandian

N.H.M. Pandian
Deponent



P. RAJUPERUMAL B.A., B.L.,
ADVOCATE / NOTARY
1/258, R.G.J. Complex,
Opp. to Collectorate
VIRUDHUNAGAR - 626 002.

Solemnly affirmed and signed
before me at Virudhunagar

அனுப்புகர்.

தலைமை ஆசிரியர்,
ஊராட்சி ஒன்றிய தொடக்கப்பள்ளி,
ஆனைகுளம் - 627 859,
DISE Code : 33290508001.

பெறுகர்.

திரு N.H.M. பாண்டியன் AvL.
8/0 K. பவதித்திடு அண்ணா பாண்டியன்,
4/7 ஜெந்தன பொது
குடிசை அட்டி (P) V.K. புதுத் துறை
தென்காடி திருச்சி.

சீய் யா,

பட்டியல் எண்கள் 302/1, 304/2A
304/1A ஆனைகுளம் திருச்சி.

பொருள்:- ஆனைகுளம் ஜெந்தன பொது
பள்ளி - கற்றல் கற்பித்தல் பணி -
LCD Smart Board - அமைத்த
து வேண்டுகள் - கீழே.

தென்காடி மாவட்டம் கடை யாருல் ஓர்
திரை ஆனைகுளம் ஜெந்தன பொது பொது
பள்ளியில் 188 மாணவ மாணவியர் கல்வி
பயிற்சி உடுகின்றனர். தற்போது நவீன கல்வித்
- கற்றல் கற்றல் கற்பித்தல் பணிபுனை அமைத்து
பொது " LCD Smart Board" அமைத்த து
அனுப்ப வேண்டுகிறேன்.

இந்த தேவியாக மாணவ மாணவியர்
கற்றல் கல்வி மட்டத்தில் புகலம் பயனாக
அமையும் எனவே ஜெந்தன பொது

நாள்: 23.06.2023

N.H.M. Pandian

தலைமை ஆசிரியர்
ஊராட்சி ஒன்றிய தொடக்கப்பள்ளி
ஆனைகுளம் - 627 859
தொடர்புள்ள ஒன்றியம்
DISE Code : 33290508001

ANNEXURE-X
NABET CERTIFICATE



**QUALITY COUNCIL
OF INDIA**
Creating an Ecosystem for Quality



National Accreditation Board for Education and Training



Certificate of Accreditation

Eco Tech Labs Pvt Ltd.,

48, 2nd Main Road, Ram Nagar South Extension, Pallikaranai, Chennai- 600100, T.N.

The organization is accredited as **Category-A** under the QCI-NABET Scheme for Accreditation of EIA Consultant Organization, Version 3: for preparing EIA-EMP reports in the following Sectors –

S. No	Sector Description	Sector (as per)		Cat.
		NABET	MoEFCC	
1	Mining of minerals - including Open cast only	1	1 (a) (i)	B
2	Thermal power plants	4	1(d)	A
3	Coal washeries	6	2 (a)	B
4	Metallurgical industries - Ferrous only	8	3 (a)	B
5	Synthetic organic chemicals industry (dyes & dye intermediates; bulk drugs and intermediates excluding drug formulations; synthetic rubbers; basic organic chemicals, other synthetic organic chemicals and chemical intermediates)	21	5 (f)	A
6	Airports	29	7 (a)	A
7	Industrial estates/ parks/ complexes/areas, export processing Zones (EPZs), Special Economic Zones (SEZs), Biotech Parks, Leather Complexes	31	7 (c)	A
8	Building and construction projects	38	8 (a)	B
9	Townships and Area development projects	39	8 (b)	B

Note: Names of approved EIA Coordinators and Functional Area Experts are mentioned in SAAC minutes dated Apr. 20, 2021 and supplementary minutes dated Oct.19, 2021 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/22/2217 dated Jan. 19, 2022. The accreditation needs to be renewed before the expiry date by Eco Tech Labs Pvt. Ltd., Chennai following due process of assessment.

Sr. Director, NABET
Dated: Jan. 19, 2022

Certificate No.
NABET/EIA/2124/SA 0147

Valid up to
Sep. 15, 2023

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





QCI/NABET/ENV/ACO/24/3167

March 07, 2024

To,

Eco Tech Labs Pvt Ltd.,
48, 2nd main road, Ram Nagar South Extn,
Pallikaranai, Chennai-600100, Tamil Nadu
(Kind Attention: Mr. A Dhamodharan)

Sub.: Extension of Validity of Accreditation till June 06, 2024– regarding

Ref.: 1. Certificate no. NABET/EIA/2124/SA 0147

2. Request e-mail dated March 02, 2024

Dear Sir,

This has reference to the Accreditation of your organization under the QCI-NABET EIA Scheme and your request email dated March 02, 2024. It is to inform your good self that the validity of **Eco Tech Labs Pvt Ltd.**, is hereby extended till **June 06, 2024**, or the completion of the accreditation process, whichever is earlier.

2. The above extension is subject to the submission of required documents/information concerning your existing application, timely submission/closure of NC/Obs (if any), and applicable fee (pending if any) during the application process.

3. You are requested not to use this letter after the expiry of the above-stated date.

With best regards.

(A K Jha)
Senior Director
QCI-NABET