EXECUTIVE SUMMARY
OF
ENVIRONMENTAL IMPACT ASSESSMENT REPORT

For

BLACK GRANITE QUARRY

OVER AN EXTENT OF 12.25.0 HECTARE

[1193/1(Part-11):6.12.5 Ha
1193/1(Part-12):6.12.5 Ha]

At

Survey No: 1193/1(Part-11) & 1193/1(Part-12)
Villages: Kodakkal
Taluk: Sholinghur
District: Ranipet
State: Tamil Nadu

By

M/s. Tamil Nadu Minerals Limited
No. 31, KamarajarSalai,
Chepauk,
Chennai – 600 005

(Project termed under Schedule 1(a) Mining of Minerals 'B1' category as per EIA Notification 2006 and its Amendments thereafter and O.M issued vide F. No. L-11011/175/2018-IA-II (M), dated: 12.12.2018)

EIA Consultant

HUBERT ENVIRO CARE SYSTEMS (P) LTD, CHENNAI

MARCH 2022

EXECUTIVE SUMMARY

I. Background

The total extent of the quarry is12.25.0 Ha Hectares in survey no: 1193/1(Part-11) & 1193/1(Part-12) Kodakkal village, Sholinghur Taluk, Ranipet District., Tamil Nadu State. Quarry land is classified as Government Poramboke land. and lease obtained by Tamil Nadu Minerals Limited (TAMIN) vide G. O. Ms. No. 3607/MME.1/2019-1, dated: 18.11.2019 for 20 years validity from Tamil Nadu Government.

The mining plan was approved by the Commissioner of Geology & Mining, Chennai vide letter No.7719/MM4/2019, dated 14.02.2020. Scheme of Mining –I is prepared for the period of first five years.

The lease area exhibits hilly terrain topography covered by massive black granite formation. Project Site Elevation is above ~112 m from AMSL.

The project falls under B1 Category, Schedule 1(a) Mining of Minerals as per EIA Notification 2006 and its amendments thereafter.Andhra Pradesh-Tamil Nadu interstate boundary (As per SOI) is located at ≃ 6.98km towards NW direction and Andhra Pradesh-Tamil Nadu interstate boundary (As per Google) is located at ≃ 7.19km towards NW direction. The project area does not fall in CRZ zone. There is no Western Ghats within the radius of 15Km from project area. There are no notified bird sanctuaries, wild life sanctuaries as per Wild life protection Act 1972, within the radius of 15Km. The project area does not fall in 'HACA' region. TAMIN applied EC through online portal on 12.08.2020 vide Proposal No SIA/TN/MIN/55510/2020.

The proposal was placed during 174th SEAC meeting held on 12.09.2020 and 403rd SEIAA meeting held on 13.10.2020. Accordingly, ToR was issued Lr No. SEIAA-TN/F.No.7748/ToR-814/2020 dated: 09.11.2020 for the preparation of EIA/EMP.

The draft EIA/EMP report has been submitted for Public Hearing (PH). After completion of public hearing, the minutes issued will be incorporated in the final EIA report along with action plan by the proponent. Final EIA report will be submitted to TNSEAC for further appraisal of the project and obtaining Environment Clearance.

II. Management Commitment

The company is assigning prime importance for environmental protection. TAMIN will comply the all environmental laws. The quarry project will maintain well developed Greenbelt. Also all the environmental statutory requirements will be implemented and maintained continually.

III. Environmental Sensitive Areas

There are no notified ecologically sensitive areas within 15km from project boundary. The Tamil Nadu state/Andhra Pradesh state boundary (As per SOI) runs in North Westerly

direction at about ≃6.98km and The Tamil Nadu state/Andhra Pradesh state boundary (As per Google) runs in North Westerly direction at about ≃7.19km from the project boundary. The Project doesn't attract the special conditions and general conditions as per EIA Notification.3no's of water bodies are located within 3km radius from the project site. Environmentally Sensitive Areas falls within 15km from Project Boundary details are given in **Table-1.**

Table-1 Environmentally Sensitive Areas within 15km from project boundary

<table>
<tr><th>S. No</th><th>Areas</th><th>Name/ identity</th><th>Aerial distance (within 15 km.)
Proposed project location boundary</th></tr>
<tr><td>1</td><td>Areas protected under international conventions, national or local legislation for their ecological, landscape, cultural or other related value</td><td>No</td><td>
<table>
<tr><th>S. No</th><th>Monuments</th><th>Distance (≈km)</th><th>Direction</th></tr>
<tr><td>1.</td><td>Rock inscriptions in the Right flank of the Sholinghur tank</td><td>2.59</td><td>NNE</td></tr>
<tr><td>2.</td><td>Somanatha Temple Melpadi</td><td>13.86</td><td>W</td></tr>
<tr><td>3.</td><td>Choleswara Temple Melpadi</td><td>13.87</td><td>W</td></tr>
</table>
<table>
<tr><th>S. No</th><th>Heritage</th><th>Distance (≈km)</th><th>Direction</th></tr>
<tr><td>1.</td><td>Kanja Sahib Tomb - Sholinghur</td><td>3.18</td><td>NNE</td></tr>
<tr><td>2.</td><td>Sapthamathrika Sculptures Perunkanchi</td><td>2.92</td><td>S</td></tr>
<tr><td>3.</td><td>Visaleeshwarar Temple Ramkrishnarajupet</td><td>9.08</td><td>NNE</td></tr>
</table>
</td></tr>
<tr><td>2</td><td>Areas which are important or sensitive for ecological reasons - wetlands, watercourses or other water bodies, coastal zone, biospheres, mountains, forests.</td><td>Yes</td><td>
Water Bodies:
<table>
<tr><th>S. No</th><th>Places</th><th>Distance (≈km)</th><th>Direction</th></tr>
<tr><td>1.</td><td>Pond near Kodakkal</td><td>0.88</td><td>SW</td></tr>
<tr><td>2.</td><td>Sholinghur Tank</td><td>2.12</td><td>N</td></tr>
<tr><td>3.</td><td>Lake near Perunganji</td><td>2.30</td><td>SSW</td></tr>
<tr><td>4.</td><td>Kallar River</td><td>6.60</td><td>ESE</td></tr>
<tr><td>5.</td><td>Nandi River</td><td>7.43</td><td>NE</td></tr>
<tr><td>6.</td><td>Paranji Lake</td><td>10.50</td><td>ENE</td></tr>
<tr><td>7.</td><td>Mahendravadi Channel</td><td>11.79</td><td>SSE</td></tr>
<tr><td>8.</td><td>Ponnai East Bank Main Canal</td><td>12.4</td><td>WSW</td></tr>
<tr><td>9.</td><td>Ponnai River</td><td>13.08</td><td>WSW</td></tr>
<tr><td>10.</td><td>Kaveripak Tank</td><td>13.29</td><td>SSE</td></tr>
<tr><td>11.</td><td>Cherukkanur Lake</td><td>14.28</td><td>ENE</td></tr>
</table>
Reserve Forests:
<table>
<tr><th>S. No</th><th>Places</th><th>Distance (≈km)</th><th>Direction</th></tr>
<tr><td>1.</td><td>Ammur RF</td><td>6.8</td><td>SSW</td></tr>
<tr><td>2.</td><td>Banavaram RF</td><td>9.87</td><td>SE</td></tr>
<tr><td>3.</td><td>Santanavenugopalapuram Ext RF</td><td>11.12</td><td>NE</td></tr>
<tr><td>4.</td><td>Santanavenugopalapuram RF</td><td>11.74</td><td>NNE</td></tr>
<tr><td>5.</td><td>Amudala RF</td><td>12.25</td><td>WNW</td></tr>
<tr><td>6.</td><td>Vanganur RF</td><td>13.84</td><td>NNE</td></tr>
<tr><td>7.</td><td>Pullur West PF</td><td>14.68</td><td>N</td></tr>
</table>
</td></tr>
</table>

<table>
<tr><td>3</td><td>Areas used by protected, important or sensitive species of flora or fauna for breeding, nesting, foraging, resting, over wintering, migration</td><td>No</td><td>Nil</td></tr>
<tr><td>4</td><td>Inland, coastal, marine or underground water</td><td>No</td><td>
<table>
<tr><th>S. No</th><th>Places</th><th>Distance (≈km)</th><th>Direction</th></tr>
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<tr><td>11.</td><td>Cherukkanur Lake</td><td>14.28</td><td>ENE</td></tr>
</table>
</td></tr>
<tr><td>5</td><td>State, National boundaries</td><td>Yes</td><td>➢ TN-AP State Boundary(As per SOI) ≈ 6.98km, NW
➢ TN-AP State Boundary(As per Google) ≈7.19km, NW</td></tr>
<tr><td>6</td><td>Routes or facilities used by the public for access to recreation or other tourist, pilgrim areas</td><td>Yes</td><td>➢ SH 61(Walajah – Sholinghur – Arakkonam) ≈0.82km , WNW
➢ NH 40(Kurnool-Ranippettai)≈ 17.63km, SW
➢ MDR 580-C.T.Road to Mahankalikapuram Road (Via) Veeramangalam Road ≈4.25 km, NNW</td></tr>
<tr><td>7</td><td>Defense installations</td><td>No</td><td>Nil within 15km radius from project boundary</td></tr>
<tr><td>8</td><td>Densely populated or built-up area</td><td>Yes</td><td>
<table>
<tr><th>S. No</th><th>Places</th><th>Distance (≈km)</th><th>Direction</th><th>Population</th></tr>
<tr><td>1.</td><td>Pudukkudiyanur</td><td>0.74</td><td>SW</td><td>240</td></tr>
<tr><td>2.</td><td>Kodakkal</td><td>0.75</td><td>S</td><td>7,948</td></tr>
<tr><td>3.</td><td>Padmapuram</td><td>1.13</td><td>NNW</td><td>720</td></tr>
<tr><td>4.</td><td>Nilotpalapuram</td><td>1.26</td><td>WNW</td><td>840</td></tr>
<tr><td>5.</td><td>Kondapalaiyam</td><td>1.36</td><td>ENE</td><td>Inside Sholinghur Town Panchayat (30,856)</td></tr>
</table>
</td></tr>
<tr><td>9</td><td>Areas occupied by sensitive man-made land uses(hospitals, schools, places of worship, community facilities)</td><td>Yes</td><td>Kodakkal village is having all the facilities which are at a distance of 0.75km (SW) from the project area.</td></tr>
</table>

<table>
<tr>
<td>10</td>
<td>Areas containing important, high quality or scarce resources(ground water resources, surface resources, forestry, agriculture, fisheries,tourism,minerals)</td>
<td>Yes</td>
<td>Water Bodies:
<table>
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</table></td>
</tr>
<tr>
<td>11</td>
<td>Areas already subjected to pollution or environmental damage. (those where existing legal environmental standards are exceeded)</td>
<td>No</td>
<td>Nil</td>
</tr>
<tr>
<td>12</td>
<td>Areas susceptible to natural hazard which could cause the project to present environmental problems (earthquakes, subsidence, landslides, erosion, flooding or extreme or adverse climatic conditions)</td>
<td>No</td>
<td>The area comes under seismic Zone-III (Moderate Risk). There is no susceptible to natural hazards like subsidence, landslides, erosion, flooding or extreme or adverse climatic conditions.</td>
</tr>
</table>

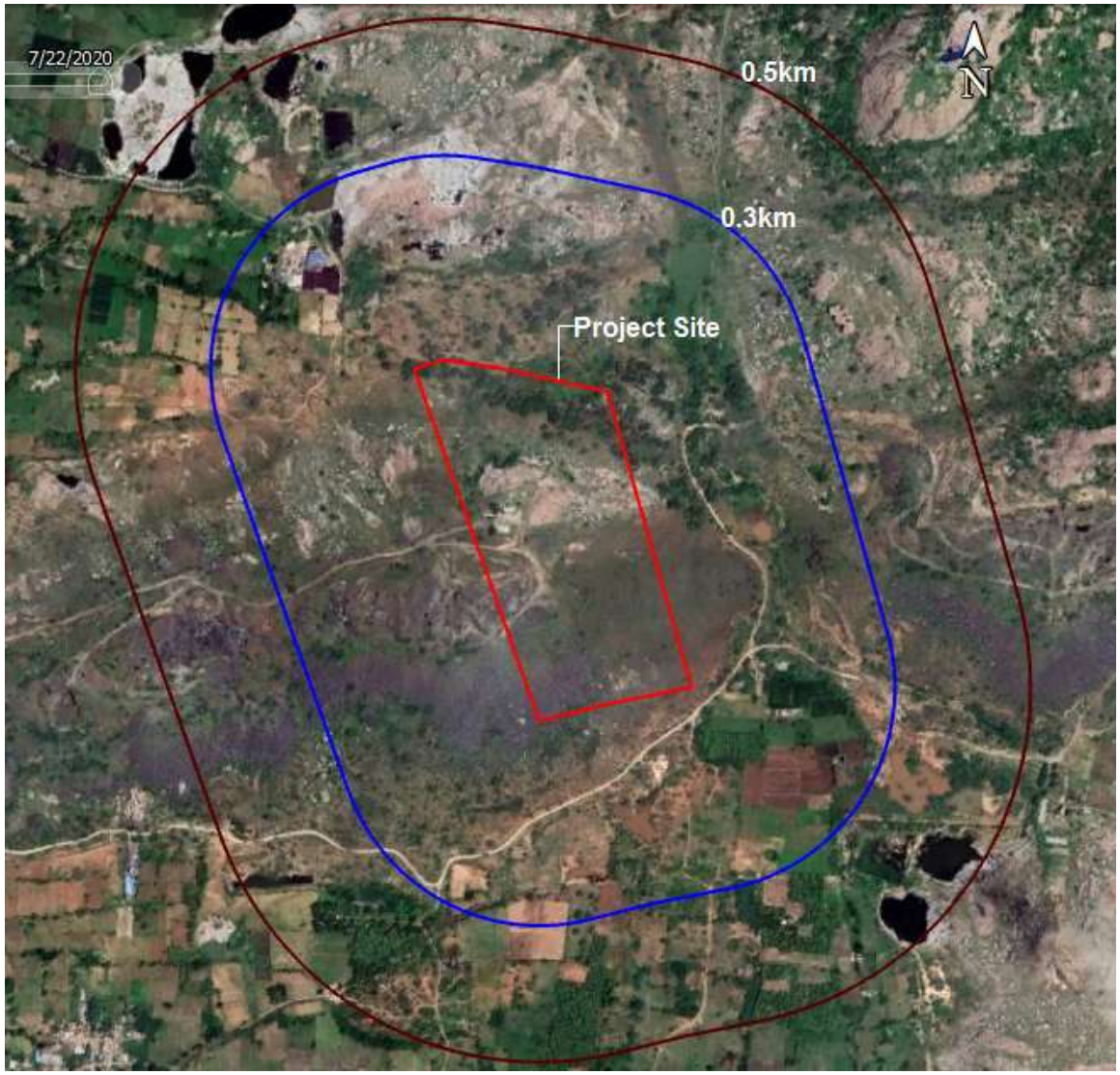


Figure-1 Google Imagery of the project site

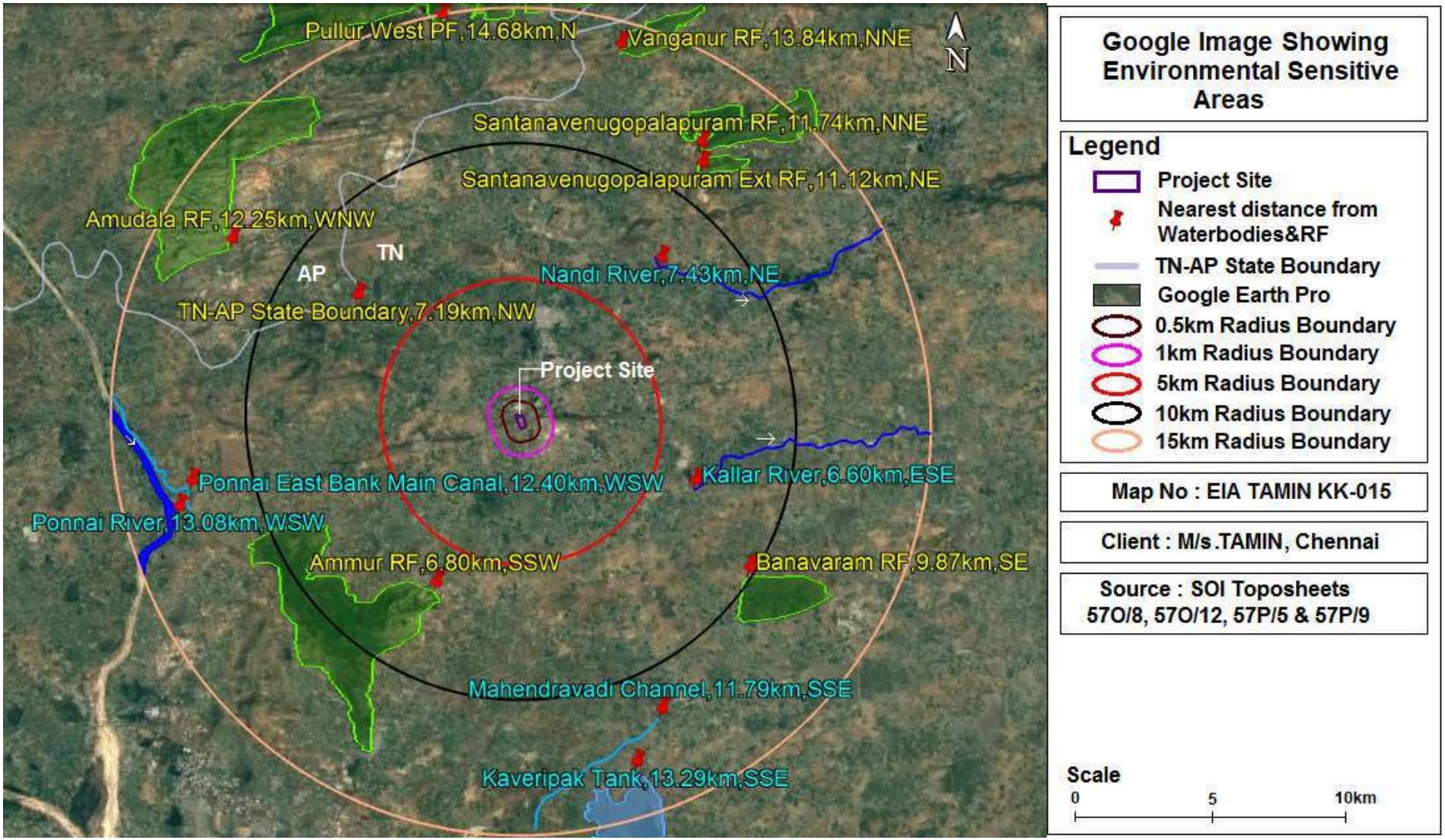
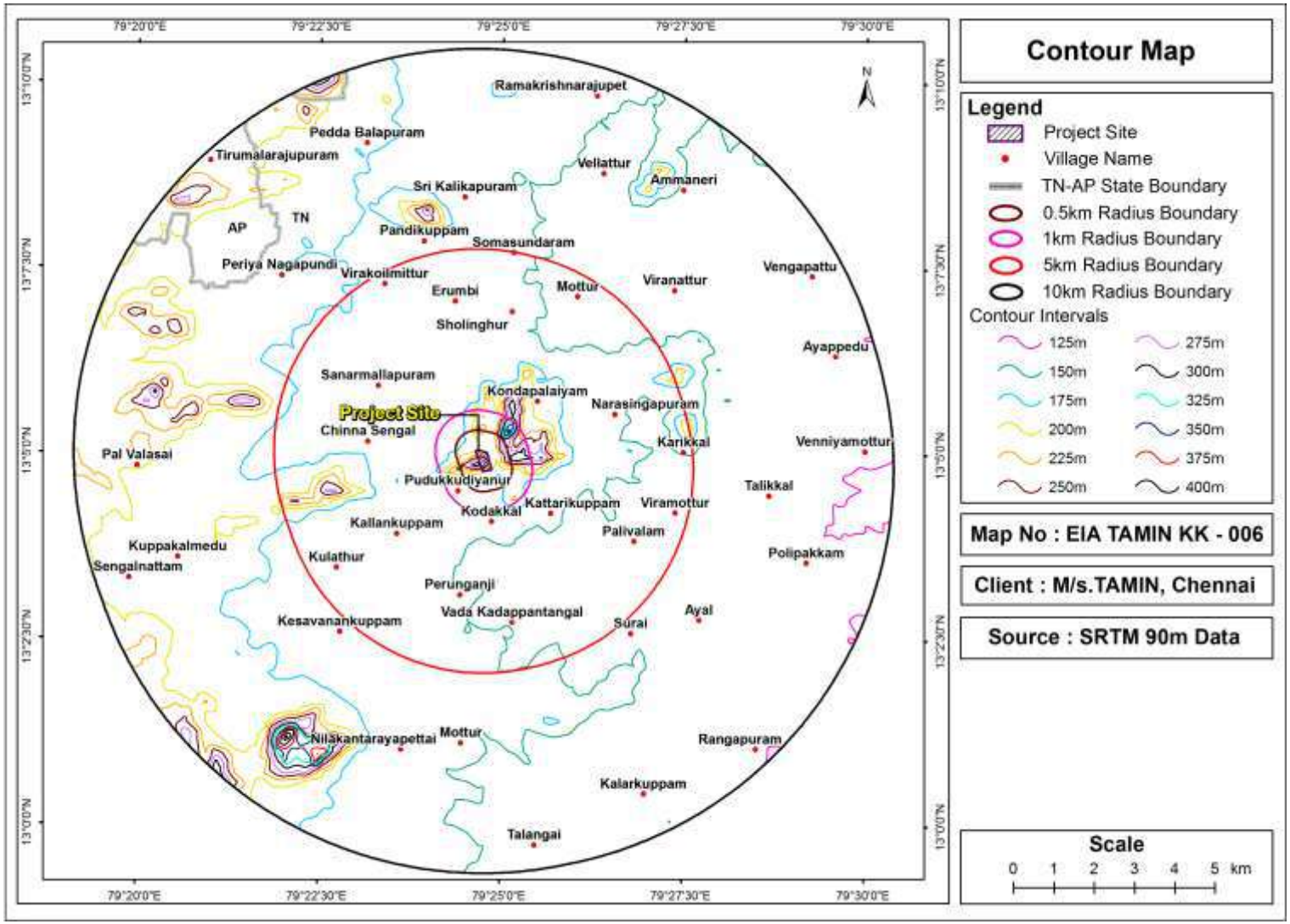


Figure-2 Environmental sensitive areas covering within 15 km from project boundary

Figure 3 Contour map of Study Area



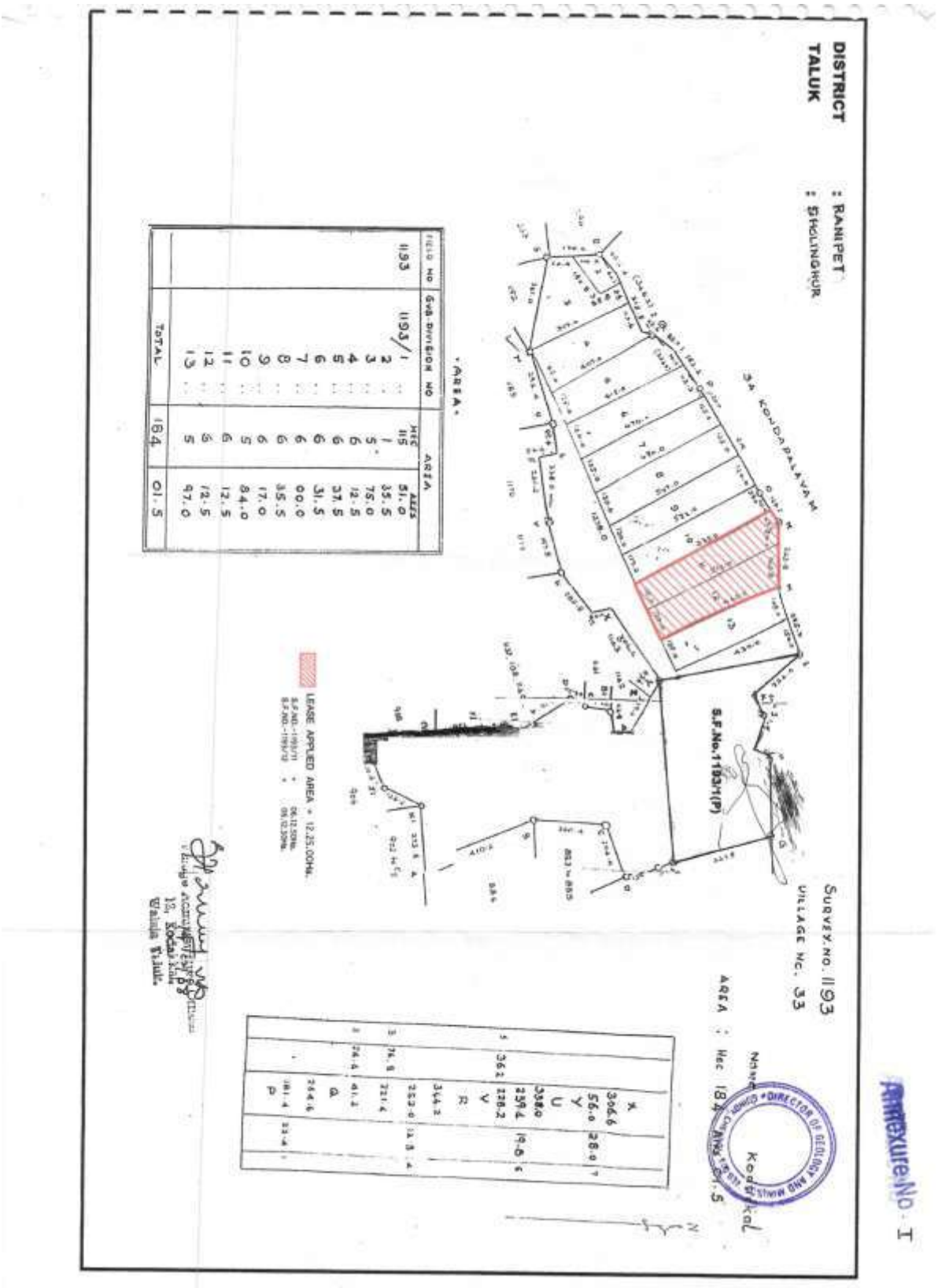

DISTRICT : RANIPET
TALUK : SHOLINGHUR
Survey No. 1193
Village No. 33
S.F.No.1193/1(P)
Annexure No. I

Figure 4 FMB

Annexure No. IV

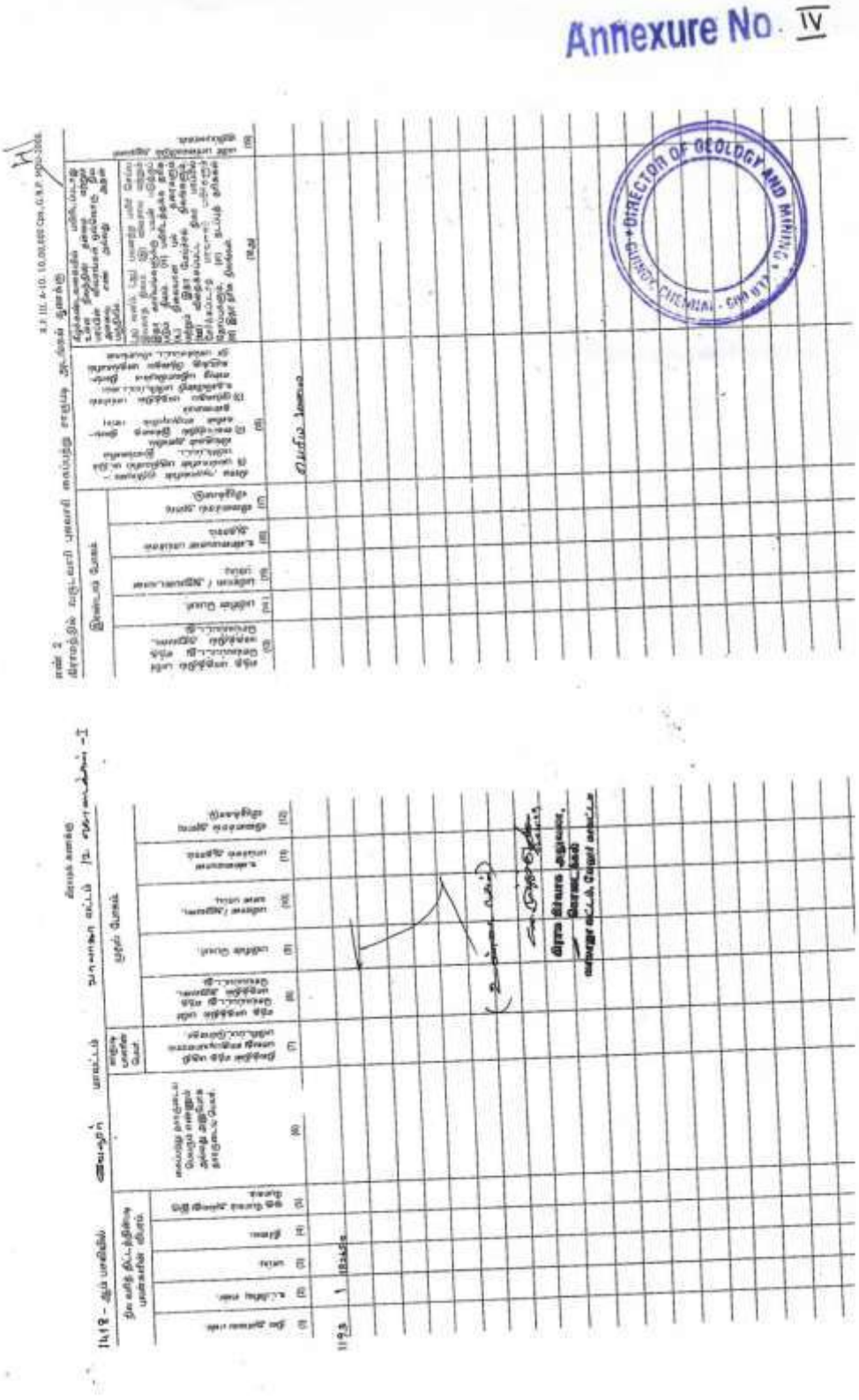


Figure- 5'A' Register

IV. Black Granite Quarry Reserves

- Geological Reserves of Black Granite estimated based on the Geological cross sections was 5,38,240 m^3. By applying the 10% recovery 53,824 m^3.
- The updated mineable reserves have been arrived as 2,23,562 m^3 and by applying 10% recovery 22,356 m^3.

V. Summary of the Magnitude of Operation

- The black granite quarrying operations will be carryout by opencast semi mechanized method by formation of benches. Benches are proposed with a height of 6m & 6m.
- Geological reserves of Black granite have been computed based on the Geological Plan & Sections up to the economically workable average depth of 40m from the top of the hill and the granite body works out to 5, 38, 240 m^3. By applying 10% recovery the effective Geological reserves works out 53,824 m^3.
- Mineable Reserves have been computed as 2,23,562 m^3 after deleting the reserves locked up in safety barrier and benches based on the Conceptual Plan and sections, the effective (Saleable) Mineable Reserves have been worked out as 22,356 m^3 by applying the recovery factor 10%. The annual peak production per year would be 2,005m^3 of ROM of saleable and 20,048m^3 of ROM during the first five year of Mining plan period at the rate of 10% recovery.

VI. Land Requirement

The Black Granite Quarry is over an extent of 12.25.0 Ha. Located in S.F.No.1193/1, Part-11 & Part-12, Kodakkal village, Sholinghurtaluk, Ranipet District, TamilNadu State, lies in the Eastern Longitude from 79°24'38.74"E to 79°24'51.88"E and Northern latitude from 13°4'45.90"N to 13° 5'2.83"N. The area is marked in the survey of India Topo Sheet No. 57 O/8, 57 O/12 & 57 P/5. The quarry area exhibits hilly terrain; the altitude of the area is above ~182 - 293 m AMSL. The method of mining is Open cast semi mechanized.The lithology of the mining lease will be submitted on final EIA report. Land use Patterns is given in **Table-2.**

Table-2 Land use Pattern

S. No	Land Use	Area to be required during the mining plan(Ha)	Area at the end of the quarrying period (Ha)
1	Area under Quarry	0.67.5	1.71.5
2	Waste Dump	1.71.0	5.89.0
3	Infrastructure	0.00.5	0.00.5
4	Road	0.15.0	0.25.0
5	Green Belt	0.06.5	0.20.0
6	Un utilized Area	9.64.5	4.19.0
	Total	**12.25.0**	**12.25.0**

VII. Granite Reserves

Table -4 Granite Quarry Reserves

S. No	Description	Granite (m^3)	Recovery 10% (m^3)	Granite waste 90% (m^3)
1	Geological Resource	5,38,240	53,824	4,84,416
2	Mineable Reserves	2,23,562	22,356	2,01,206

Table -5Year wise Production details

S. No	Year	ROM (m^3)	Recovery @10% (m^3)	Granite Waste @ 90 % (m^3)	Side Burden (m^3)
1	First	20,085	2009	18076	-
2	Second	19,954	1995	18999	1040
3	Third	19,997	2000	17997	1599
4	Fourth	20,075	2007	18068	1959
5	Fifth	20,128	2013	18115	1096
Total		**1,00,239**	**10,024**	**90,215**	**5,694**

Estimated Life of the Quarry:

- Mineable ROM : 2, 23,562 m^3
- Mineable Recoverable Reserved @10% : 22,356 m^3
- Average Production per Year@10% : 10,024/5 Years= 2,005 m^3
- Estimated Life of the Quarry : 22,356/2,005 m^3=11 years

VIII. Water Requirement

Table-6 Water requirement breakup

S. No	Description	Water Requirement (KLD)
1	Drinking &Domestic purpose	1.5
2	Wire Saw Cutting	0.5
3	Dust suppression	1.0
4	Green Belt	0.5
	Total	**3.5**

IX. Power & Fuel Requirement

The power requirement is 60 kVA. The Power requirement is met through DG set with a capacity of 125 kVA**.** ThePower & Fuel requirement is given in **Table-7.**

Table-7Power&Fuel Requirement

S. No	Description	Power Required
1	Power requirement (kVA)	60
2	Power Backup (DG set)	1*125 kVA
3	Fuel requirements (Lts/Day)	200

X. Manpower

Manpower details are given in **Table-8.**

Table -8 Man power of the Project

S. No	Description	Numbers
A. Technical/Mining Personnel		
1	Geologist/Agent (M.Sc., Qualified)	1
2	Mine Manager (Holder of Mines Manager Certificate of Competency under MMR, 1961	1
3	Mining Mate cum Blaster	1
4	Machinery operator	6
5	Diesel Mechanic	1
B . Workers		
1	Skilled	1
2	Semi- Skilled	9
3	Un-skilled	10
Total		**30**

Indirect manpower is 20Nos.

XI. Solid Waste Generation & Management

Municipal Solid Waste Management

Table -9 Municipal Solid Waste generation & Management

S. No	Type	Quantity Kg/day	Disposal method
1	Organic	8.1	Municipal bin including food waste
2	Inorganic	5.4	TNPCB authorized recyclers
Total		**13.5**	

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

XII. Hazardous Waste Management

The type of hazardous waste and the quantity generated are given in **Table-10.**

Table -10 Hazardous Waste Generation and Management

Waste Category No	Description	Quantity (L/Year)	Mode of Disposal
5.1	Waste Oil	3.0	Will be Collected in leak proof containers and disposed TNPCB Authorized Agencies for Reprocessing/Recycling

XIII. Nearest Human Settlement

The detail of nearest human settlement from the project site is provided in **Table-11.**

Table-11. Nearest Human Settlement

S. No	Name	Distance (~km)& direction	Population Census 2011
1	Pudukkudiyanur	0.74(SW)	240
2	Kodakkal	0.75(NNW)	7,948
3	Padmapuram	1.13(ENE)	720
4	Nilotpalapuram	1.26(S)	840
5	Kondapalaiyam	1.36(SE)	Inside Sholinghur Town Panchayat(30,856)

XIV. Industries within 15km radius

The details of Industries within 15km radius from the project site are given in **Table -12.**

Table -12 Industries within 15km radius from the project site

Sl. No	Description	Dist(~km)	Direction
1.	Turbo Energy Private Limited-TEL	2.22	ESE
2.	Brakes India Unit-2	2.27	ESE
3.	Brakes India Warehouse	2.37	E
4.	Brakes India Limited - Brake Division	2.67	NNE
5.	Brakes India Private Ltd	3.09	NE
6.	Sholingur Textiles Ltd	3.72	ENE
7.	TVS Supply Chain Solutions Ltd C/o Turbo Energy Pvt Ltd	3.87	ESE
8.	Poorvik Engineering Pvt Ltd (Plant II)	4.09	SE
9.	Midrange auyo components	4.47	S
10.	ABI Soorai Green	5.94	SSE
11.	Sri Muni Pachaiyappan Textiles Pvt Ltd	7.15	ENE
12.	Real Talent Engineering Pvt Ltd	7.74	NNE
13.	RSVS Granite	12.71	SSE
14.	Dewas Metal Sections	13.47	WSW
15.	Sri Ramana Industries	14.16	SW
16.	Caprienzymes	14.3	SW
17.	AKSOL Indutries	14.35	SW
18.	Powergear Ltd	14.54	WSW
19.	Kostal India Pvt Ltd	14.7	WSW
20.	Uttam Polyrubs India Pvt. Ltd	14.71	SSW
21.	Nezone Tubes Ltd	14.72	WSW
22.	Gnutti Carlo India Pvt Ltd	14.72	SW
23.	MKK Metal Sections Pvt Ltd	14.75	WSW
24.	TCT Aqua Chemicals P Ltd	14.75	SSW
25.	Sicgilsol India Pvt Ltd	14.76	WSW
26.	Sanskar Chemicals & Drugs Pvt Ltd	14.79	SSW
27.	Funskool (India) Ltd	14.84	WSW
28.	Metco Roof Pvt Ltd	14.88	WSW
29.	Madhavan Dyeing Factory	14.93	E

XV. Analysis of Alternatives Sites Considered :-

Alternate sites are not considered as there is some good granite material in this field.

XVI. Project Cost

The total capital investment on the project is 99.97 Lakhs. The Capital investment of the Project is given in **Table-13.**

Table-13 Capital Investment on the Project

S. No	Description of the Cost	Cost in Lakhs
I. Fixed Asset Cost		
1	Land Cost (Lease)	--
	Labours Shed	50,000
	Sanitary facilities	50,000
	Fencing Cost	1,25,000
	Sub Total	**2,25,000**
II. Variable cost		
1	**Operational Cost**	
	Machineries	95,67,000
	Sub Total	**95,67,000**
2	**EMP Cost**	
	Afforestation	30,000
	Water Sprinkling	50,000
	Water Quality Test	25,000
	Air Quality Test	25,000
	Noise/Vibration Test	25,000
	Sub Total	2,05,000
3	**CSR Activities**	50,000
Grand Total		**99,97,000/- ≃Rs. 1 Crore**

XVII. Mine Closure Plan

- In the Black Granite Quarry operations proposed bench height of 6m for the first five years and 40m during the entire life of the quarry, hence the ground water will not be disturbed in any manner. Afforestation will be carried out and maintained in the safety barriers till the plants reach the stabilize level.
- Office room, Toilet, Store room will be well maintained. The sludge from the toilet will be periodically removed and the same will be used as a manner for afforestation.
- Sentries will be posted in the night to prevent the inadvertent entry of public. Sufficient caution and sign boards will be kept in and around the quarry to induct public for awareness.
- Blasting will be carried out in a specific time after giving sufficient caution to the public, sentries will be posted on a 1km radius with whistle and flags during small amount of blasting (blasting is carried out only for secondary fragments and not to liberate the granite body from the parent rock mass).
- It is proposed not to back fill the ultimate pit, in as much as good quantity of reserves is available below the workable depth of 40m and there is possibility of technology of up

gradation in granite mining for greater depths in course of time for safe mining at economic cost beyond 40m depth. The pit boundaries shall be safely fenced and used for agricultural purpose when the pit is filled with underground see page or rain waters.

- Afforestation and green belt development will be maintained in all the boundaries, till the trees attain the stabilize level. At present area is virgin.

XVIII. Description of Environment

Meteorological Environment

The micro-meteorological conditions during the study period for hourly data of wind speed, wind direction and temperature were recorded at the project site. The nearest Indian Meteorological Department (IMD) station located to project site is Vellore, the annually determined wind direction is North East.

The site specific meteorological data of study period, during the study period **(December 2020 - February 2021)**.Maximum temperature is 38^{o}C Minimum temperature is 25^{o}C and Avg. Temperature: 36.3^{0}C. Relative humidity is 65%. Average Wind Speed is in study period is 4.1m/s Study period predominant wind pattern is from South West.

Table-14Total maximum GLCs from emissions

Pollutant	Max. Base Line Conc. (µg/m^3)	Estimated Incremental Conc. (µg/m^3)	Total Conc. (µg/m^3)	NAAQ standard	% contribution of concentration above Base line
PM_{10}	67	14	81	100	20.90
$PM_{2.5}$	31	9	40	60	29.03
SO_2	16	1	17	80	6.25
NO_X	28	3	31	80	10.71

Ambient Air Quality

Maximum concentrations of PM_{10}, $PM_{2.5}$, SO_2, NO_2, CO, Pb, O_3, NH_3, C_6H_6, C_{20} H_{12}, As,Ni, are well within the National Ambient Air Quality Standards for Industrial, Commercial and Residential areas at all monitoring locations during the study period.

The ambient air quality has been monitored at 8 locations for 12 parameters as per NAAQS, 2009 within the study area. The average baseline levels of PM_{10} (43.7 µg/m³-68.5 µg/m³), $PM_{2.5}$ (23.6 µg/m³ -38.9 µg/m³), SO_2 (8.6 µg/m³ – 16.9 µg/m³), NO_2 (19.7 µg/m³ – 35.2µg/m³), CO (0.18mg/m^3 – 0.37mg/m^3) and some are BDL, all the parameters are well within the National Ambient Air Quality Standards for Industrial and Residential areas at all monitoring locations during the study period.

Noise Environment

Ambient noise levels were monitored using precision noise level meter in and around the project site at 10 km radius at 8 locations during study period. In industrial area, day time noise level was about 56.9 dB(A) and 49.6 dB(A) during night time, which is within prescribed limit by MoEF&CC (75 dB(A) Day time & 70 dB(A) Night time).

In residential area day time noise levels varied from 50.5 dB(A) to 54.8 dB(A) and night time noise levels varied from 41.2 dB(A) to 43.5 dB(A) across the sampling stations. The field observations during the study period indicate that the ambient noise levels in Residential area is within the limit prescribed by CPCB (55 dB (A) Day time & 45 dB (A) Night time).

Water Environment

The prevailing status of water quality at 08 locations for surface water and 8 locations for ground water have been assessed during December 2020 - February 2021.The standard methods prescribed in IS were followed for sample collection, preservation and analysis in the laboratory for various physiochemical parameters.

Surface water quality

- pH ranges from 7.26 to 8.24.
- Total Dissolved Solids range from 640 mg/l to 796 mg/l.
- Total hardness ranges between 207 mg/l – 376 mg/l.
- BOD values varying from 2 to 8mg/l.
- COD varies from 17 to 52 mg/l.
- The concentration of heavy metals like As, Cd, Cr, Pb, Mn, Hg, Ni and Se at all locations are within the limits of IS 2296:1992.

Ground Water Quality

- The average pH ranges from 6.94-8.27.
- TDS value varied from varied from 560 mg/l to 798 mg/l
- The chloride concentration ranged from 108.5mg/l to 247.2 mg/l
- Sodium range from 62.5 mg/l to 109.6 mg/l
- Potassium concentration range from 3.9 to 7.2 mg/l.
- Magnesium ranges from 19.2 to 38.6 mg/l within the permissible limitof the IS 10500: 2012.
- The sulphate content of the ground water of the study area is varied between 38.2 mg/l – 95.2 mg/l meeting the acceptable limit of the IS 10500: 2012’
- It is observed that all the collected ground water samples meets the drinking water standards (IS 10500:2012) and can be used for drinking.

Land Environment

Assessment of soil characteristics is of paramount importance since the vegetation growth, agricultural practices and production is directly related to the soil fertility and quality. Soil sampling was carried out at eight (08) locations in the study area. It is observed that,

- The pH of the soil samples ranged from 7.24 -8.56.
- Conductivity of the soil samples ranged from 194 – 286umhos/cm
- Nitrogen content ranged from 132.7 mg/kg to 179.4 mg/kg
- Phosphorous ranged from 13.8 mg/kg - 27.8 mg/kg
- Potassium content ranges from 225.8 mg/kg - 412.3 mg/kg.

Biological Environment

The species observed in the study area are mostly commercial crops and plantation crops and breaks were also observed throughout the semi-evergreen and moist deciduous forest types. There is no extinct flora and fauna species found in the study area.

XIX. Socio Economic Environment

In 2011 census, the total population of Vellore district was 3936331. Of this, rural population was 2234344 and urban population was 1701987. In 2001, they were 3477317, 2169319 and 1307998 respectively. Madapalli village in Tirupathur taluk had the highest population of 14,868 and Madakadappa R.F. village in Vaniyambadi taluk recorded the lowest population of 14 in the district. Ambur Reserve Forest Village in Ambur taluk is the largest village with an area of 10656.09 hectares and Ambur Plantation Reserve Forest in Ambur taluk is the smallest village with an area of 2.47 hectares.

The rural literacy was 67.4% in 2001 which has marginally increased to 7.3% in 2011 with 74.7% while the urban literacy in the district was 80.5% in 2001. The urban literacy in the district has seen significant increase in 2011 census compared to 2001 census. In 2011 census, Vellore district has returned 79.2% as literate population; males with 86.5% and females with 71.9%.The total literacy in 2001 was 72.4%; males with 82.4% and females at 62.8%.

Socio Economic profile of the study area:

- The project is in the village of Kodakkal of sholinghur taluk of Ranipet district.
- The area is rural and the main occupation is agriculture and its related activities.
- The population of the project area is 3,32,573.
- The male and female population is 1,67,282 and 1,65,291 respectively.

XX. Anticipated Environmental Impacts

Air Environment

The emissions mainly generated from the mining activities are Blasting, Drilling, Excavation, Loading, Unloading, and transportation etc. Machinery like compressors and jack hammers are used for Drilling. Fugitive dust control in quarry is given in **Table-15.**

Table-15 Fugitive dust control in Quarry

S. No	Activities	Best practices
1	Drilling	Drills should be provided with dust extractors (dry or wet system)
2	Blasting	➢ Water spray before blasting ➢ Water spray on blasted material prior to transportation ➢ Use of controlled blasting technique
3	Transportation of mined material	➢ Covering of the trucks/dumpers to avoid spillage ➢ Compacted haul road ➢ Speed control on vehicles ➢ Development of a green belt of suitable width on both sides of road, which acts as wind break and traps fugitive dust

Noise Environment

Baseline study showed that the noise levels in both Industrial area and in Residential area are slightly exceeded the limit prescribed by MoEF&CC. The designed equipment with noise levels not exceeding beyond the requirements of Occupational Health and Safety Administration Standard will be employed.

Land Use

The quarry is in operations since 1995 and extent of lease area is 12.25.0Ha. Land classifies as a Government land, Mining Lease obtained from Tamil Nadu Government for 20 years videLr. No. 3607/MME.1/2019-1, dated: 18.11.2019

Wastewater Management

Sewage (1.27 KLD) is being sent to septic tank. There is no process effluent generation in quarry project.

Biological Environment

To reduce the adverse effects on flora/fauna status that are found in project area due to deposition of dust generating from mining operations, water sprinkling and water spraying systems will be ensured in all dust prone areas to arrest dust generation.

Solid/ Hazardous Waste Management

Municipal Solid Wastes including food waste are being disposed to municipal bin.

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.

Risk Identification & Management

❖ **Identification of Hazards in Open Cast Mining**

There are various factors, which can cause disaster in the mines. These hazards are as follows:

- Drilling
- Blasting
- Overburden handling
- Heavy Machinery

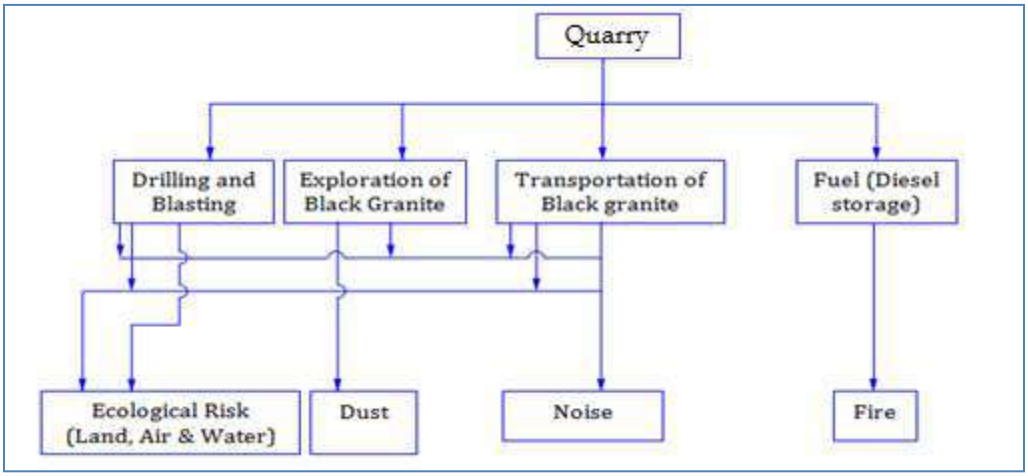


Figure-6 Identification of hazards in opencast mine

❖ **Safety Measures at the quarry**

- Adequate care has been taken in deciding the size of the bench for the working pit.
- The benches are properly sloped at an angle of 60 degree to avoid any spillage of benches.
- Adequate drainage system at the top of the pit and also on the benches shall be made to prevent erosion of the benches.
- The quarries will be protected by garland drains around the periphery for storm water drainage.

Post Project Environmental Monitoring

Table -16 Post Project Environmental Monitoring Program

S. No	Area of Monitoring	Number of Sampling Stations	Frequency of Sampling	Parameters to be Analyzed
1.	Meteorology	One	Hourly and Daily basis.	Wind speed and direction, Temperature, Relative Humidity, Atmospheric pressure, Rainfall.
2.	Ambient Air Quality	2 Stations (In downwind)	Twice a week:24 hourly period	PM_{10}, $PM_{2.5}$, SO_2, and NO_2
3.	Noise	2 (two within core area and two in buffer area)	Once every season	Ambient Equivalent continuous Sound Pressure Levels (Leq) at day and Night time.
4	Exhaust from DG set	Stack of DG set	Quarterly	PM_{10}, $PM_{2.5}$, SO_2 & CO
5	Vehicular Emissions	Parking area	Periodic monitoring of vehicles	Air emission and noise, PCU
6	Soil	2 Locations within Project Site	Yearly Once	Physico chemical properties, Nutrients, Heavy metals
7	Terrestrial Ecology	Within 10km, around the project	Once in three years	Symptoms of injuries on plants
8	Surface/ Ground water quality	Two Locations Within Project Site	Yearly Once	As per ISO 10500 Standard parameters

XXI. Disposal of Waste

The Mine waste in the mine includes the over burden, side burden, rock fragments and rubbles generated as mineral rejects during production works and the country rock fragments generated during development works as approach road formation, formation of dumping yard sites etc., During the first five years of Mining Plan period, such waste material are proposed to be dumped along the Southern part of the lease area where it comprises of country rock terrain.A sustainable plastic waste management plan by installing bins for collection/Segregation of recyclable and non-recyclable plastic waste at the proposed project site will be implemented.

XXII. Occupational Health Measures

- Adoption of dust suppression measures like spraying water, use of drill with dust collection system or wet drills etc.
- Plantation.
- Avoid blasting during unfavorable wind & atmospheric conditions.
- Use of personal protective equipment. Compliance with DGMS circulars.
- Emergency response plan that includes installation of emergency response equipment to combat events such as fire.

- All personnel required to handle hazardous materials will be provided with personal protective equipment suitable for the hazardous material being handled.
- On-site first aid facilities will be provided and employees will be extended to the local community in emergencies.

XXIII. Greenbelt Development

The green belt plantation programme will be continued till the end of the mining operation in the area. In framing out this programme on a sustainable and scientific base, due consultation and coordination with the forest department will be sought. The existing plantation will be developed inside the mining lease is about 0.06.50Ha, out of 12.25.0Ha.Plants are chosen to provide aesthetic, ecological and economical value. Trees will help to arrest propagation of noise and help to lessen dust pollution due to dust arresting action. The total of Rs.30,000/- allocated for greenbelt activities.

XXIV. Emergency Management Plan

The salient features of Emergency Management Plan include

- Emergency shutdown procedure
- Fire protection system
- Emergency safety equipment & Reporting and response to emergency
- Emergency Help from nearby industries and tie up with nearby industries.

XXV. Corporate Environmental Responsibility

- TAMIN Kodakkal site had no Relocation and Rehabilitation.
- Most villages have benefitted mutually at Kodakkal where the mining industry has provided indirect jobs for labor and villages provide accommodation for the labor and staff. Supportive industries like food supply and essential shops are economic growth in the villages.
- 2 %(Rs.1,99,940) on total cost will be allocated for CER activities.

XXVI. Benefits of the Proposed Project

- The quarrying activities will give benefit toe local people 30 & 20 Nos direct and indirect.
- Improvement in Per Capita Income.
- Local pancayat as well as Govt. will get benefits by means of Royalty, DMT and other taxes
- The socio - Economic conditions of the village and distance will enhance due to the project, hence the project should be allowed after considering all the parameters.
- It can thus be concluded that the project is environmentally compatible, financially viable and would be in the interest of construction industry thereby indirectly benefiting the masses.

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