Executive Summary

For

Proposed Naganur Multi Colour Granite Quarry over an extent of 2.93.0 ha of patta land

At

Survey No.: 135/1A, 136/1A and 136/2
Naganur Village
Kulithalai Taluk
Karur District
Tamil Nadu State

By

Thiru.M.Gandhi
S/o. Masanam
Karattupatti Village
Theni District
TamilNadu

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

Proposal No: SIA/TN/MIN/481951/2024, dated: 25.05.2023
ToR : SEIAA-TN/F.No.10241/SEAC/ToR-1548/2023 Dated: 27.09.2023
Amendment ToR File Number: 10241 Dated: 12.07.2024
Baseline Period: March 2023- May 2023

EIA Consultant & Laboratory
M/s. HUBERT ENVIRO CARE SYSTEMS (P) LTD, CHENNAI
NABET Certificate No & Validity: NABET/EIA/24-27/RA 0335, valid up to 31.03.2027
NABL Certificate No: TC-12310 Dated: 25.09.2023 Valid Till 24.09.2025

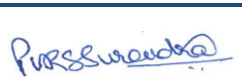
July 2024

Revision status

Name of the Client	:	**M.Gandhi**
Name of the Project	:	Proposed Naganur Multi Colour Granite Quarry over an extent of 2.93.0 Ha of patta land
Name of the report	:	Executive Summary

Project No: H/01/2023/CON/019	**Document No:** RP004

Revision details:

Rev No.	Date	Details	Prepared by: Name	Prepared by: Sign	Checked by: Name	Checked by: Sign	Approved by: Name	Approved by: Sign
R0	25.05.2024	1st Submission	P.V.R.Surendra		Vamsee		J.R.Moses	

Executive Summary

1.INTRODUCTION

The Proposed Naganur Multi Colour Granite Quarry is over extent of 2.93.0Ha of patta land in the name of Mr.M.Gandhi. The project falls under Schedule 1(a) Mining of Minor Minerals, B2 category as per EIA Notification 2006 and its Amendments thereafter and the proposed project is termed under Schedule 1(a) Mining of Minor Minerals, B1 category, as per the O.M issued vide F.No. L-11011/175/2018-IA-II (M), dated: 12.12.2018 considering the cluster mines of 21.25.0Ha area which is more than 5.00 Ha.

The Proponent has submitted lease application on 08.01.2007. Subsequently the Precise area Communication letter was obtained from the Industries Department, Vide Letter No. 3846/MMB2/2008-1, dated 25.09.2008. The mining plan was prepared and the same was approved by the Geology and Mining Department, Guindy, Chennai vide Rc. No.1765/MM2/2007, dated 10.11.2008. Mining plan period is valid upto 24.12.2013. The lease was granted vide G.O. (3D) No.123 Industries (MMB-2) Department, dated 10.12.2008 for a period of twenty years. Lease G.O enclosed as **Annexure-2**. The quarry lease deed was executed on 25.12.2008. The lessee Mr.Gandhi has made the agreement with the land owner Mr.P. Sureshkumar (Patta No. 1202) from his Power of Attorney Mr. S. Nelson for 20 years and the lease period is valid upto 24.12.2028 is enclosed in **Annexure 6&7**.

The first Scheme of mining was prepared and submitted for the period (2013-14 to 2017-18) only, due to first two years (2013-14 and 2014-15) of the scheme period already lapsed at the time of preparation. Then the Second Scheme of mining was submitted and approved for the period 2018-19 to 2022-23 vide Rc.No.4588/MM2/2018, dated 10.09.2018. The proponent has obtained EC from District Environment Impact Assessment Authority, Karur District, and Tamil Nadu vide Letter No. DEIAA-DIA/TN/MIN/17863/2018-KRR Ec.No.21/2018 Mines, dated 09.10.2018 is enclosed in **Annexure-10.** The EC granted for the period of five years 2018-19 to 2022-23 for the quantity of 40,072m^3.

The proponent has renewed the Consent from Tamil Nadu Pollution Control Board Vide Consent Order No. 2308151228480 Dated 27.03.2023 is valid upto December 24, 2023. Also the proponent has obtained work permit from the Assisstant Director of Department of Geology and Mining, Karur District Vide Rc.No.1361/Mines/2017, Dated: 21.06.2024 is enclosed in **Annexure-13**. The permit issued quantity as per AD letter is 7,425.605m^3 and the balance quantity is 32,646.395m^3. Based on the letter mentioned above, date of the last permit issued was 06.11.2023 and the total permit issued quantity as on date was 7425.605m^3.

The third Scheme of mining is prepared and approved by Vide Rc. No 8878/MM2/2023 dated 20.02.2023 for the period of 25.12.2023 to 25.12.2028 (five years). Subsequently, ToR application submitted to TN SEIAA vide online proposal no.SIA/TN/MIN/430781/2023, dated 25.05.2023, the proposed production capacity of the quarry was 39,858m^3 at 25% Recovery (ROM-1,59,427m^3) for the period of five years for the depth of 18m from the below ground level.

As per the MoEF&CC Office Memorandum F.No.IA3-22/11/2023-IA.III (E-208230), dated 28.04.2023, all valid EC issued by DEIAA shall be reappraised through SEAC/SEIAA. Since the quarry is in operation from at the time of appraisal the proposed project is appraised under violation category based on the O.M F.No.IA3-22/11/2023-IA.III (E-208230), dated 28.04.2023 during 407th SEAC meeting held on 07.09.2023 and 658th SEIAA meeting held on 26.09.2023 & 27.09.2023 and recommended for ToR under violation issued vide Letter No. SEIAA-TN/F.No.10241/SEAC/ToR-1548/2023, dated 27.09.2023. The Certified Compliance Report obtained from Regional Office, MoEF&CC vide EP/12.1/2023-24/SEIAA/126/TN/385, dated 21.03.2024 is obtained and enclosed in **Annexure-19**.

However based on MoEF&CC Office Memorandum F.No.IA3-22/11/2023-IA.III (E-208230), dated 03.11.2023, the EC granted by DEIAA which is valid as on date shall continue to be valid for 1 year from the date of issue of O.M dated 28.04.2023 and also based on MoEF & CC Office Memorandum F.No.IA3 -22/11/2023- IA.III (E-208230), dated 15.03.2024 the time period of 1 year provided in the O.M dated 28.04.2023 shall be extended for a further period of six months till 27.10.2024.

Hence the proponent requested SEAC/SEIAA for ToR amendment under Non-Violation Category and submitted ToR amendment application on 20.06.2024. Based on this, the application was appraised in 477th SEAC meeting and subsequent 737th SEIAA meeting and Amendment ToR obtained vide TOR Identification number TO24B0108TN5627909A Dated: 12.07.2024 based on F.No.IA3-22/11/2023-IA.III (E-208230), dated 03.11.2023 and F.No.IA3 -22/11/2023- IA.III (E-208230), dated 15.03.2024, for the proposed production of 1,59,427m^3 ROM and production capacity of 39,858m^3 @ 25% recovery from ROM for the estimated geological reserves of 9,55,888m^3 and Mineable Reserves of 3,18,959m^3 of multi coloured granite is enclosed in **Annexure-1**.

As per the issued Amendment ToR vide TO24B0108TN5627909A, Draft EIA has been prepared and will be submitted to Tamil Nadu Pollution Control Board, Karur District for public hearing. After public hearing, the final EIA will be submitted along with the compliance for PH Minutes to SEIAA/SEAC for seeking Environmental Clearance.

Table-1 Salient Features of the Project Site

<table>
<tr><td>Survey No.</td><td>135/1A, 136/1A and 136/2</td></tr>
<tr><td>Village</td><td>Naganur</td></tr>
<tr><td>Taluk and District</td><td>Kulithalai Taluk, Karur District</td></tr>
<tr><td>State</td><td>Tamil Nadu</td></tr>
<tr><td>Toposheet No.</td><td>C44G 5& 6</td></tr>
<tr><td>Latitude</td><td>10°44’13.432” N to 10°44’21.983” N</td></tr>
<tr><td>Longitude</td><td>78°24’02.530” E to 78°24’08.003” E</td></tr>
<tr><td>Extent Area</td><td>2.93.0Ha
<table>
<tr><th>S.No</th><th>SF.No</th><th>Area in HA</th></tr>
<tr><td>1</td><td>135/1A</td><td>1.88.5</td></tr>
<tr><td>2</td><td>136/1A</td><td>0.73.0</td></tr>
<tr><td>3</td><td>136/2</td><td>0.31.5</td></tr>
<tr><td colspan="2">Total</td><td>2.93.0</td></tr>
</table></td></tr>
<tr><td>Land</td><td>Patta Land (Patta no. 1202)</td></tr>
<tr><td>Project Cost</td><td>Rs.1,25,88,300</td></tr>
<tr><td>Lease Period</td><td>20 Years</td></tr>
<tr><td>Estimated Geological Reserves (ROM)</td><td>9,55,888m^3</td></tr>
<tr><td>Estimated Mineable Reserves (ROM)</td><td>3,18,959m^3</td></tr>
<tr><td>Proposed Production at 25% Recovery</td><td>39,858m^3(ROM-1,59,427m^3)</td></tr>
<tr><td>Depth of Mining</td><td>ExistingDepth-12m(BGL)
Proposed Depth-18m(BGL)</td></tr>
<tr><td>Method of Mining</td><td>Opencast Semi mechanized</td></tr>
<tr><td>Nearest Roads</td><td>• Major District Road MDR-482(Togaimalai-Mylampatti) at 0.37km, S
• SH-71(Musiri- Manaparai- Sethubavachathiram) at 0.38km, ENE
• NH-83Coimbatore-Nagapattinam) & NH-45(Chennai- Theni) at 11.84km, SSE</td></tr>
<tr><td>Nearest Railway station</td><td>Samudram Railway Station at 13.70km, SE</td></tr>
<tr><td>Nearest Airport</td><td>Tiruchirappalli International Airport at 33.19km, E</td></tr>
<tr><td>Nearest Town / City</td><td>Town – Manapparai at 14km, S
City – Tiruchirappalli at 25km, ENE</td></tr>
<tr><td>Water Requirement</td><td>5KLD</td></tr>
</table>

Power Requirement	120kVA
Fuel Requirements	78,960 liters for 5 years
Approved Quantity as per EC	40,072m^3
Permit Issued Quantity	7,425.605m^3
Balance Quantity	32,646.395m^3
Depth of Water Table	50m

As per Rc.No.1361/Mines/2017 dated 23.05.2023, the existing quarry details within 500m radius are given below.

Table-2 Cluster Details within 500m Radius

S.No	Name of the lessee	Area (Ha)	S.F.No	Lease Period
1.	Thiru.M.Gandhi S/o. Masanam, Karattupatti Village, Andipatti Taluk	2.93.0	135/1A, 136/1A, 136/2	25.12.2008 to 24.12.2028
2.	Tvl.TAMIN Ltd 31, Kamarajar Salai, Cheppauk, Chennai -5	10.12.0	120(Part)	06.03.2023 to 05.03.2043
3.	M/s.PRP Exports Therkkutheru Village, Melur, Madurai District.	1.83.0	149/3B(Part) 150(Part)	17.12.2008 to 16.12.2028
4.	M/s.PRP Exports Therkkutheru Village, Melur, Madurai District.	1.95.0	123/4 134/1	17.12.2008 to 16.12.2028
5.	M/s.G.V Granites, 19G.Main Road, Thogamalai, Kulithalai Taluk, Karur District	1.39.0	160/2B, 160/5A, 160/5C,449/1B	21.09.2004 to 20.09.2024
6.	M/s.PRP Exports Velu Complex, Madurai Main Road, Melur, Madurai District	2.01.5	149/1B1(P), 149/3A1(P), 149/3B(P), 150(P)	08.06.2005 to 07.06.2025
7.	Thiru.M.Singaram 21/B Chathiram St, Thogamalai , Kulithalai Taluk, Karur District	1.01.5	148/1F2(P), 160/2A1, 160/3, 160/4	06.07.2007 to 05.07.2027
Totaal Cluster Area		**21.25.0**		

2. PROJECT DESCRIPTION

2.1 Method of Quarrying

An open cast quarrying by semi-mechanized method will be adopted to operate the quarry. The total production is 39,858m^3 with annual peak production would be 8,050m^3 of granite during the five year of Mining plan period at the rate of 25% recovery from ROM of 1,59,427m^3.

2. 2 Conceptual Quarry Plan

The geological resource estimated based on the geological cross-sections up to the economically workable depth of 42m (1m top soil+41m Multi coloured granite) depth below from the ground profile yields 2,38,972m^3 at the rate of 25% recovery and 9,55,888m^3 of ROM.

The mineable reserves have been computed as 79,740m^3 at the rate of 25% recovery and 3,18,959m^3 of ROM. The mineable reserves are calculated by deducting the mineral locked up area under safety distance and bench loss. Hence the remaining area is taken for calculation of mineable reserves upto 18m depth.

The total proposed ROM is 1,59,427m^3 The total recoverable reserves of 25% is 39,858m^3. The annual peak production would be 8050m^3 of Multi Colour granite during the five year of Mining plan period at the rate of 25% recovery.

Table- 3 Proposed and Achieved Quantity in the Previous Scheme of Mining Period (2008-2023)

Year	Proposed		Achieved					
	ROM	Production @20%	Waste 80%	Total excavation	Top soil	ROM (pro+waste)	Despatch	Waste reject non saleable block
25.12.2008 - 24.12.2018	-			19284	3100	16184.000	2402.321	13707.590
25.12.2018 - 24.12.2019	39504	7901	31603	4200.00	--	4200.000	1354.024	2845.976
25.12.2019 - 24.12.2020	40164	8033	32131	545.000		545.000	313.449	231.551
25.12.2020 - 24.12.2021	40032	8006	32026	781.250		781.250	443.048	338.202
25.12.2021 - 24.12.2022	40452	8090	32362	6135.380		6135.880	1654.223	4481.657
25.12.2022 -	40212	8042	32170	12983.338		12983.338	2500.043	10483.295

07.06.2023								
Sub total	**200364**	**40072**	**160291**	**24645.468**	**0**	**24645.468**	**6264.787**	**18380.681**
Grand total	**200364**	**40072**	**160291**	**43929.468**	**3100**	**40829.468**	**8667.108**	**32162.360**

Table-4 Existing Pit Details

Depth No	Existing R.L	Pit R.L	Area in m2	Top soil		ROM)		Total Volume (m3)
				depth (m)	Volume (m3)	depth (m)	Volume (m3)	
Depth 1	144	141	2724	1	2724.000	2	5448.0	8172.0
Depth 2	144	138	376	1	376.000	5	1880.0	2256.0
Depth 3	144	138	681	-	-	6	4086.0	4086.0
Depth 4	144	134	930	-	-	10	9300.0	9300.0
Depth 5	144	132	1676.29	-	-	12	20115.468	20115.468
Total					**3100.000**		**40829.468**	**43929.468**

Table-5 Excavation Details

Total excavation as per existing pit(m^3)	Despatch (m^3)	Rough Block Stock (m^3)	Top Soil used for		Waste utilized for ramp and road (m^3)	Waste Dump (80 x 47 x 7.8m (Avg)
			Afforestation	Bund 135 x 5x 3m Avg		
43929.468	8667.108	470.472	1075.00	2025.0	2363.688	29328.0

Table -6 Yearwise Development/Production for the next Five Years

Year	Section	RL	Bench	Length (m)	width (m)	Depth (m)	Volume in (m^3)	Recovery @25% (m^3)	Waste @ 75% (m^3)	Top soil (m^3)
25.12.2023 to 24.12.2024	XY–AB	144-138	I	85	25	1				2125
		144-138	I	85	25	5	10625	2656	7969	
		141-138	II	40	27	3	3240	810	2430	
		134-132	II	22	35	2	1540	385	1155	
		138-132	II	75	35	6	15750	3938	11812	
		Total					**31155**	**7789**	**23366**	**2125**
25.12.2024 to 24.12.2025	XY-CD	144-143	I	43	38	1				1634
		143-141	I	43	38	2	3268	817	2451	
		144-143	I	10	50	1				500
		143-141	I	10	50	2	1000	250	750	
		141-138	I	40	85	3	10200	2550	7650	
		138-132	II	40	73	6	17520	4380	13140	
		Total					**31988**	**7997**	**23991**	**2134**
25.12.2025 to 24.12.2026	XY-EF	144-143	I	29	109	1				3161
		143-138	I	29	107	5	15515	3879	11636	
		138-132	II	29	95	6	16530	4133	12397	
		Total					**32045**	**8012**	**24033**	**3161**
25.12.2026 to 24.12.2027	XY-GH & XY-AB	144-143	I	39	75	1				2925
		143-138	I	39	75	5	14625	3656	10969	
		138-132	II	33	63	6	12474	3119	9355	
		132-126	III	17	50	6	5100	1275	3825	
		Total					**32199**	**8050**	**24149**	**2925**
25.12.2027 to 24.12.2028	XY-AB & XY - CD	132-126	III	89	60	6	32040	8010	**24030**	**-**
	Total						32040	8010	**24030**	**-**
	Grand Total						**159427**	**39858**	**119569**	**10345**

Total Proposed ROM : 1, 59, 427m^3
Total Recoverable Reserves@ 25% : 39, 858 m^3
Granite waste @ 75% : 1,19,569 m^3
Topsoil : 10,345 m^3
Granite waste : 1:3

2.3 Man power Requirement

Manpower details are given below.

Table -7 Manpower Details

S.No	Description	No of persons
A	**Technical/Mining Personnel**	
1	Mine Manager (Holder of Manager Certificate of Competency under MMR, 1961	1
2	Mines Foreman	1
3	Machinery operator	4
B	**Workers**	
1	Skilled	16
2	Semi- Skilled	20
3	Un-skilled	13
	Total	**55**

2.4 List of Equipments

The list of Equipment is given below.

Table -8 List of Machineries

S. No	Machinery	Capacity	Numbers
1	Excavator	300 LC	2
2	Compressor	450/150 psi	2
3	Dumpers/Tippers	25/10 Tonnes	2
4	Diamond wire saw	10 m^3/day	2
5	Jack Hammers (32mm dia.)	1.2 to 6m	4
6	Diesel Generator	125 kva	1
7	Hyd.drilling machine	60hp	2
8	Crawlercrane	855	2
9	Mobile crane	12T	1

2.5 Land Use pattern of the study area

Land Use Pattern of the Mining lease area is given in below table

Table-9 Land Use Pattern

S.No	Description	Present area (Ha)	Area required during present Scheme Period in Ha	Area at the end of the quarry (Ha)
1	Area under quarry	0.60.3	1.02.9	1.63.2

2	Safety area	0.68.5	0.00.0	0.68.5
3	Waste dumps	0.27.5	0.15.4	0.42.9
4	Infrastructure	0.00.0	0.01.0	0.01.0
5	Roads	0.01.0	0.01.0	0.02.0
6	Green Belt	0.01.0	0.01.0	0.02.0
7	Stocking Blocks	0.02.8	0.10.6	0.13.4
8	Untouched area	1.31.9	-1.31.9	0
Total		**2.93.0**	**0**	**2.93.0**

2.6 Waste Management

Total topsoil will be generated during this scheme period is 10,345m^3 which will be preserved all along the safety zone and will be utilized for construction of bund and afforestation purposes. Total waste produced during this scheme period will be around 1,19,569m^3. The total waste material will be proposed to dump on the North eastern side with maximum dimension of (L)90m X (W) 47m X (H) 28.27m avg which will be act as temporary waste dump.

2.7 Greenbelt Details

The total area for the proposed green belt is 0.01.00 Ha during 5 years of the proposed quarrying activity and it is proposed to plant 125 no's of trees within the 7.5m safety buffer zone mine lease area.

Table-10 Proposed Greenbelt Development Details

Year	No of trees proposed to be planted	Area to be covered in m^2	Name of the species to be plant	Survival rate expected in %	No of trees expected to be grown
2023-28	125	1100	Neem, Casuarinas, Pongamia Pinnata, Tamarind	80	100

3. IMPACTS AND MITIGATION MEASURES

3.1 Impacts due to Mining

Various environmental impacts which have been identified due to the mining operations are discussed in the following sections. The environmental parameters most commonly affected by mining activities are:

3.2 Soil Environment

3.2.1 Impacts

Potential impacts on land environment are envisaged due to hazardous and non-hazardous wastes generated due to various operations in the project site like municipal waste from domestic use and waste diesel oil from quarry machineries.

3.2.2 Mitigation Measures

Good housekeeping and best practices of waste handling shall be adopted to eliminate/minimize the risks of soil contamination. The wastes generated will be stored in temporary storage facility and transferred to nearby municipal disposal bins. Waste oil generated from quarry machineries and the same is disposed through TNPCB Authorized dealers.

3.3. Land Environment:

3.3.1 Land Degradation

The impact on land will be due to the following aspects:

- Land degradation due to disposal of large volume of waste materials.
- Creation of infrastructural facilities like office, rest shelter, first-aid centre and other service facilities.

3.3.2. Mitigation Measures

- Dust suppression using water sprinklers.
- Contour overburden dump to minimize erosion.
- Greenbelt around infrastructures within the mine lease area and along the road by using native plants.

3.4 Air Environment:

3.4.1 Impacts on Air Environment

The major air pollution sources from the mining operations are DG sets, mining activities like drilling, blasting and transportation. The DG sets are provided with stacks of adequate height to disperse the emanating flue gases containing suspended particulate matter, oxides of Sulphur and nitrogen without affecting the ground level concentrations. 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. The sources of air emission are detailed below in **Table 11**.

Table-11 Sources of air pollution at quarry

S. No	Source of emission	Pollutant
1.	Excavation of Granite	PM
2.	Operation of diesel driven equipment	Gaseous emission
3.	Transportation of product	PM

3.4.2 Mitigation measures

- Use of dust aprons on drilling equipment and adopting wet drilling methods.
- Using controlled blasting, the impact of air pollution was mitigated.

- The production of blast fumes containing noxious gases will be redused by the following methods:
  - Use of adequate booster/primer.
  - Proper stemming of the blast hole.
  - Development of greenbelt.

Table-12 Dust control measures in quarry

S. No	Operation or source	Control options
1	Drilling	➢ Liquid injection (water or water plus a wetting agent) ➢ Capturing and venting emissions to a control device. ➢ Drills should be provided with dustextractors (dry or wet system)
2	Blasting	➢ Water spray before blasting ➢ Water spray on blasted material prior to transportation ➢ Use of control blasting technique
3	Loading	Water spray
4	Hauling	Water spray, treatment with surface agents, soil stabilization, Traffic control.
5	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

3.4.3. Air Quality Modelling:

Total maximum GLCs from emissions as given below

Table -13 Total maximum GLCs from emissions

S.No	Pollutant	Max. Base Line Conc. (µg/m^3)	Estimated Incremental Conc. (µg/m^3)	Total Conc. (µg/m^3)	NAAQ standard
1.	PM	69.73	10.36	80.09	100
2.	SO_2	18.92	0.73	19.65	80
3.	NO_X	24.75	1.67	26.42	80

The maximum ground level concentration observed due to mining activities and vehicular movement by using air modelling for PM, SO_2 and NO_x are 80.09µg/m^3, 19.65µg/m^3 and 24.62µg/m^3 respectively.

3.5. Impacts due to Transportation

The Granite is transported to consumer directly as based on the requirement. The granite will be transported through existing road by tippers and approximate trips required is 2 times per week. This minimum trip does not create impact on existing transportation.The vehicular movement for the proposed project is given in below table.

Table-14 Traffic Volume after Implementation of the Project

For the Road	Volume of Traffic	Volume (V)	Road Capacity (C)	V/C Ratio	LOS Category*	Traffic Classification
Existing	4003	4589	15000	0.31	"A"	Free Flow
After implementation	4007	5943	15000	0.31	"A"	Free Flow

**LOS (Level of Service) categories are A-Free Flow, B- Reasonably Free Flow, C-Stable Flow, D-Approaching unstable flow, E- Unstable flow, F- Forced or breakdown flow*

Due to propose project there will be slight increment in the vehicle movement but the level of service (LOS) anticipated will be Free Flow.

3.5.1 Mitigation Measures

- Regular water sprinkling on haul and access roads.
- Greenbelt development along the haul roads, dumps and along the boundaries of the lease area.
- Utmost care will be taken to prevent spillage of sand and stone from the trucks.

3.6 Wastewater Generation

There is no effluent generation. The domestic sewage of 1.6 KLD will be disposed through septic tank followed by soak pit.

3.6.1. Mitigation Measures

3.6.2. Surface Water Pollution Control Measures

- Construction of garland drains of suitable size around mine area and dumps to prevent rain water descent into active mine areas.
- During monsoon season, the rain water will be collected by natural slope of area to water fed tank of the mine and it will be utilized for dust suppression and greenbelt development.
- The dump tops will be provided with inner slopes to control water flow to prevent erosion washouts. The dumps tops and slopes of in active areas will be covered with grasses, shrubs, mulching, etc, to prevent erosion, till final backfilling of dumps into mined out areas.

3.6.3. Ground Water Pollution Control Measures

- The domestic sewage from the toilets will be routed to septic tanks.
- Regular monitoring of water levels and quality in the existing open wells and bore well in the vicinity will be carried out.

3.6.4. Rain Water Harvesting

The rainwater will be diverted by garland drains to the sump area within the mine lease. The stored water will be used for agriculture activities.

3.6.5. Mitigation Measures

- Construct barriers at suitable intervals along the path of the drains.
- Provide necessary overflow arrangement to maintain the natural drainage system.

3.7. Impact of Noise / Vibrations & Mitigation Measures

3.7.1. Impact of Noise

The main sources of noise in the mine are as follows:

- Transportation vehicles
- Loading & unloading of minerals
- Drilling
- Controlled Blasting

3.7.3. Noise Due to Blasting

Blasting activities are involved in this Quarry as green belt will be developed around the mine which restricts the propagation of noise. The main source of noise in quarrying is due to usage of machinery like excavators, mining tippers and compressors and diesel generators.

3.7.4. Mitigate Measures

Following mitigation measures should be taken to control noise pollution are,

- Wherever the noise levels exceed 85 dB (A), workers should be provided with earmuffs, ear plugs etc.
- All vehicles and machinery will be properly lubricated and maintained regularly.
- Speed of the Vehicles entering and leaving the quarrying lease will be limited to 25 kmph.
- Unnecessary use of horns by the drivers of the vehicles shall be avoided.
- Controlled blasting with proper spacing, burden and stemming will be maintained
- No secondary blasting.
- Minimum quantity of detonating fuse will be consumed by using alternatively Excel non-electrical initiation system.
- The blasting will be carried out during favorable atmospheric condition and less human activity timings.

3.8. Impact of Vibration

Blasting activities are involved in Granite Quarry operations. The vibration during the moment of machinery will be minimal for a short span that will be well within the prescribed limits.

3.8.1. Mitigation Measures

- Proper quantity of explosive, suitable stemming materials and appropriate delay system are to be adopted for safe blasting.
- Safe blasting zones are kept around the periphery of the quarry.
- Proposed peripheral green belt will be developed in 7.5m safety zone around the quarry.
- Overcharging will be avoided. The charge per delay will be minimized and preferably more number of delays will be used per blasts.

3.9. Impact on Human Settlement

There are no monuments or places of worships in mine area. Ground vibration and noise pollution is maintained minimal and confined to the mine area. The quality of water both surface and ground water is good and all parameters of drinking water are as per IS standards. Water quality analysis will be carried out at periodical intervals during post project monitoring.

The PM, NOx and SO_2 have been observed to be below the prescribed limit. Noise levels have also been found to be below the permissible limits at all the locations.

3.8.1. Mitigation Measures

- The noise generated in the lease area will get attenuated due to plantation all around the lease area.
- As preventive measures, greenbelt development around the mine lease area will be further strengthening for control of air emission to environment.
- All the employees will be periodically medically examined.

3.9. Biological Environment

3.9.1. Mining activities and their impact on biodiversity

Table -15 Impacts on Biodiversity

S. No	Activity	Examples of aspects	Examples of biodiversity impact
1	Extraction	Land clearing	Loss of habitat, introduction of plant diseases, Siltation of water courses
2	Blasting, Digging and hauling	Dust, noise ,vibration, water pollution	Disruption of water courses ,impacts on aquatic ecosystems due to changes in hydrology and water quality
3	Waste dumping	Clearing, water and soil pollution	Loss of habitat, soil and water contamination, sedimentation.
4	Air emissions	Air pollution	Loss of habitat or species

5	Waste disposal	Oil and water pollution	Encouragement of pests, disease transfer, contamination of groundwater and soil
6	Access roads	Land clearing	Habitat loss or fragmentation, water logging upslope and drainage shadows down slope
7	Water supply (potable or industrial)	Water abstraction or mine dewatering	Loss or changes in habitat or species composition

3.9.2. Mitigation Measures

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. The proponent has proposed a sum of Rs. 8,62,500/-for the conservation plan for the schedule -1 Species listed in the below table.

Table -16 List of Schedule -1 Species in the study area

Sl.No	Common Name	Scientific Name	IUCN status	
	Phasianidae			
1	Indian peafowl	*Pavo cristatus*	LC	Sch- 1
	Accipitridae			
2	Brahminy kite	*Haliastur indus*	LC	Sch- 1
3	Shikra	*Accipter badius*	LC	Sch- 1

3.10. Impacts on Occupational Health due to project operations

Anticipated occupational illness sequel to mining activities involved in the project. Occupational health problems due to dust & noise and Occupational illness by quarry activities are as follows;

- Dust related pneumonia
- Rheumatic arthritis
- Segmental vibration disorder

3.10.1. Mitigate Measures for Occupational Health

- Adoption of dust suppression measures like spraying water, use of drill with dust collection system or wet drills etc.
- Development of Green Belt
- 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.

Table-17 Mitigation for occupational health and safety

S.No	Activity	Mitigation measures
1	Excavation	➢ Planned excavation, avoid haphazard mining
2	Drilling and blasting	➢ In addition, the operators and other workers should be provided with masks, helmets, gloves and earplugs. ➢ Using controlled blasting techniques
3	Safety zone	➢ Provisions for a buffer zone between the local habitation and the mine lease in the form of a green belt of suitable width. ➢ Restricted entry, use of sirens and cordoning of the blasting area are some of the good practices to avoid accidents.
4	Overburden stabilization	➢ Accidents are known to happen due to overburden collapse. ➢ Therefore, slope stabilization and dump stability are critical issues for safety and environment. Proper measures will be taken care.
5	Worker's health surveillance	➢ Health survey programmers for workers and local community. ➢ Regular training and awareness of employees to be conducted to meet health and safety objectives.

3.11. Mitigation Measures for Safety Aspects

- To reduce pollution emanation from quarry operations, carry out splitting of sheet rock by diamond wire saw which largely reduces the dust and noise generation.
- Water sprinkling on haul roads and dumping yards, etc.
- Green belt creation wherever possible to arrest dust and reduce noise propagation.
- All staff and workers will be provided with PPE to guard against excess noise levels
- Provision of safety Helmets, goggles, safety boots, ear muffs, gas masks, etc.
- To provide appropriate instruction, training, retraining, vocational training, etc.
- Organization of safety contests and safety campaigns regularly to update knowledge of safe operational procedures, etc.
- Observation and compliance of all precautions, control measures and stipulations on above lines will ensure that in this project, health and safety problems will be minimal.

4. PROJECT COST & ESTIMATED TIME OF COMPLETION

4.1. Project Cost

The estimated project cost is given below

Table-18 Project Cost

S.No	Description of the Cost	Amount in Rs.
A. Operational Cost		
1.	Land Cost S.F.Nos.12/1A to 12/3E and 12/5A=2.13.0HaxRs.1,91,000/Ha=4,06,830/- S.F.Nos.12/4A to 12/4B=0.17.0HaxRs.2,12,500/Ha=36,125/-	5,83,000

2.	Labourers shed (already constructed)	2,00,000/-
3.	Sanitary facilities	75,000/-
4.	First aid room and Accessories & safety kits	50,000/-
5.	Excavator (2nos)	35,00,000/-
6.	Crawler crane (1 no)	15,00,000/-
7.	Diesel generator (1 no)	7,50,000/-
8.	Tipper (1 no)	7,00,000/-
9.	Diamond wire saw (2 nos)	6,00,000/-
10.	Compressor with loose tools (2 nos) & jack hammer (4 nos)	8,00,000/-
11.	Wagon drill (2 nos)	8,00,000/-
12.	Drinking water facility & water sprinkling	1,00,000/-
13.	Fencing cost (700m lengthxRs.300/- per meter)	2,19,000/-
14.	Garland Maintenance	1,65,000/-
15.	Greenbelt development under safety zone during this scheme period (200m saplimgxRs.200/-per saplimg)	20,000/-
	Total	**1,00,62,000/-**
B. EMP Cost		
1.	Air Environment	9,09,300
2.	Noise	50,000
3.	Water Environement	23,000
4.	Waste Management	1,10,000
5.	Implementation of EC, Mining Plan & DGMS Condition	11,84,000
6.	Greenbelt	2,50,000
	Total	**25,26,300**
	Total Project Cost	**1,25,88,300**

4.2. Proposed schedule for approval and implementation

The time schedule for the completion of the proposed mining project is given in the below table.

Table-19 Project schedule

Particulars	Time Schedule
Submission of Draft EIA/EMP to TNPCB for Public Hearing	August 2024
Conduction of Public Hearing and submitting final EIA/EMP	September 2024
Presentation to SEAC and Obtaining EC	November 2024

The project will be implemented after Obtaining EC from SEIAA and CTO from PCB.

4.3 CER Activity:

The proponent is proposing for CER activities for the Thogaimalai Government Higher Secondary School for Rs.4.0 Lakhs. Based on O.M F.No. 22-65/2017-IA.III dated 1.05.2018, 1.0% of the Project Cost need to be spent for CER activities i.e., Rs. 1.26 Lakhs need to be spent for the CER activity. However the proponent proposing for Rs. 4.0Lakhs which is 3.1% of Project cost.

5. MINING CLOSURE PLAN

5.1. Progressive Mine Closure Plan

The various schedules for mining activities regarding mining of granite block, waste disposal, proposed land use pattern, environmental preservation measures, disaster management plan, etc. have been fully covered in the EIA/EMP report. Pit boundaries shall be safely fenced and the pit water filled with underground seepage or rain water will be used for agriculture purpose. Afforestation and green belt development will be maintained in all the boundaries, till the trees attained the stabilized level. When the remaining reserves will be completely exhausted, the mine closure plan will be prepared and submitted to the competent authority to obtain approval and the same will be implemented. At the end of the quarry, pit boundaries shall be safely fenced with 7.5m buffer safety zone and rain water or seepage water stored in the pit will be used for agriculture purpose. Garland drain will be constructed around the quarry area to prevent surface run off rain water entering to the pit.

6. REHABILITATION AND RESETTLEMENT

There will be no Rehabilitation and Resettlement in this proposed project.

7. SITE ANALYSIS

Environmental sensitive such as water bodies, reserved forest, wildlife sanctuary, national park, human settlements and other ecological features are given below.

7.1 Environmental Sensitive areas

The environmental sensitive areas covering an aerial distance of 15 km from the project boundary is given in below table.

Table-20 List of Water Bodies

S.No	Water bodies	Distance (~km)	Direction
1	Pond	Adjacent to Site	W
2	Paranthadi Lake	0.89	SW
3	Nayakkar Kulam	1.06	ENE
4	Kalugur Lake	2.00	NW
5	Gudalur Lake	4.38	NNE
6	Stream near Gudalur	4.40	NNE
7	Kalladai Lake	5.66	ESE
8	Napili R	5.67	ENE
9	Toppampatti Lake	8.12	S
10	Puttur Lake	8.39	ENE
11	Nallur Lake	9.73	NNE
12	Ponnai Ar/Mamundi Ar/Ariyar R	12.87	SE
13	Lake near Samudram	13.52	SE

14	New Kattalai High Level Canal	13.89	NE
15	Panjappatti Lake	14.23	NW
16	Pungar R	14.26	NW

Table-21 List of Monuments

S.No	Monuments	Distance (~km)	Direction
1	Togaimalai Sri Subramanya Swamy Temple & Sri Meenakshi Sundareswar Temple	1.65	SE

Table-22 List of Reserved Forest

S.No	Reserved Forest	Distance (~km)	Direction
1	Viramalai RF	2.82	WSW
2	Amaiyapuram RF	11.37	SSW
3	Vaiyamalaippalaiyam RF	13.40	WSW

Table-23 Nearby Human Settlement

S.No	Villages	Distance (km)	Direction	Population
1	Kirshnanpatti	0.18km	SSW	50
2	Mettuppatti	0.27km	NNE	250
3	Mettupillaiyar	0.47km	W	200
4	Muttakkanpatti	0.78km	NE	150
5	Paranthadi	0.96km	SSW	100
6	Togaimalai	0.99km	SE	9,792

8. BASELINE STUDY

8.1. Study Period

The baseline environmental surveys were carried out during March 2023-May 2023 with in the study area

8.2. Ambient Air Quality

Table-24 Summary of Ambient Air Quality Monitoring

S.No	Parameters (µg/m³)	Minimum of Average	Maximum of Average	NAAQ Standards
1	PM_{10}	44.16	58.68	100
2	$PM_{2.5}$	17.63	29.24	60
3	SO_2	7.72	15.93	80
4	NO_2	11.42	20.83	80

The ambient air quality has been monitored at 8 locations for 13 parameters as per NAAQS, 2009 within the study area.

8.3. Noise Environment

Ambient noise levels were monitored using precision noise level meter in and around the project site at 10km radius at 8 locations during study period.

- In Industrial areas day time noise levels was about 52 dB (A) and 43 dB (A) during night time, which is within prescribed limit by CPCB (75 dB(A) Day time & 70 dB(A) Night time).
- In residential areas day time noise levels varied from 50 dB (A) to 54 dB (A) and night time noise levels varied from 40 dB (A) to 43 dB(A) across the sampling stations. The field observations during the study period indicate that the ambient noise level is within the prescribed limit by CPCB (55 dB (A) Day time & 45 dB (A) Night time).

8.4. Water Quality

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

8.4.1 Surface water quality

Table -25 Summary of Surface Water Quality Monitoring

S.No	Parameters	Minimum	Maximum	IS 2296:1992 Standards
1	pH	6.1	8.4	6.5 – 8.5
2	TDS (mg/l)	419	498	500
3	COD (mg/l)	27	46	-
4	BOD (mg/l)	5	9	2
5	Total Hardness	77.46	188.4	-

8.4.2 Ground Water Quality

Table-26 Summary of Ground Water Quality Monitoring

S.No	Parameters	Minimum	Maximum	IS 10500: 2012 Standards	
				Acceptable Limit	Permissible Limit
1	pH	6.1	7.2	6.5 – 8.5	NR
2	Total Hardness (mg/l)	168.4	364.2	200	600
3	Total Dissolved Solids(mg/l)	449.7	954.4	500	2000

8.5. Soil Quality

Assessment of soil characteristics is paramount importance for the soil fertility and quality. Soil sampling was carried out at eight locations in the study area. The summary of the soil quality is given below

Table-27 Summary of Soil Quality Monitoring

S.No	Parameters	Minimum	Maximum
1	pH	4.5	6.2
2	Electrical conductivity (µS/cm)	910	2310
3	Nitrogen (mg/kg)	55.0	93.56
4	Phosphorus (mg/kg)	2.993	7.511
5	Potassium (mg/kg)	47.50	82.57

9. WASTE HANDLING

9.1. Solid Waste Management

The municipal solid waste generation and management details are given in **Table-28**.

Table-28 Municipal Solid Waste generation & Management

S.No	Type	Quantity Kg/Day	Disposal Method
1	Organic	14.85	Municipal Bin
2	Inorganic	9.9	TNPCB authorized recyclers
	Total	**24.75**	

As per CPHEEO guidelines: MSW per capita/day =0.45

9.2. Hazardous waste Management

The type of hazardous waste and the quantity generated are given in **Table-29**

Table-29 Hazardous Waste 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 to TNPCB Authorized Agencies

10. POST PROJECT MONITORING

10.1. Post Project Environmental Monitoring

The Project proponent set up regular monitoring stations to assess the quality of the environment.

Table-30 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 (One in upwind and one in downwind)	Twice a week:24 hourly period	PM10, PM2.5, 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	PM10, PM2.5, SO_2, and CO

5	Vehicular Emissions	Parking area	Periodic monitoring of vehicles	Air emission and noise, PCU
6	Soil	Two Locations within the 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 2012 & IS 2296 - 1992 Standard parameters

11. CONCLUSION

The proposed **"Proposed Naganur Multi Colour Granite Quarry over an extent of 2.93.0 Ha of patta land"** will be beneficial for the development of the nearby villages. Due to this proposed quarry, 55 no's of employment potential will be deployed which increase the social benefits of nearby villages. Environmental aspects like dust emission, noise, siltation due to surface run-off, etc. will have to be controlled within the permissible limit to avoid impacts on the surrounding environment. Necessary pollution control equipment like water sprinkling, plantation, personal protective equipment, etc., will form regular practice in the project. Additional pollution control measures and environmental conservation measures will be adopted to control/minimize impacts on the environment and socio-economic environment of the area. Measures like development of green belt and plantation along with transport road will be created. The CER measures proposed to be adopted by the proponent will improve the social and economic status of the nearby villages.