EXECUTIVE SUMMARY

PROJECT PROPONENTS

Sl. No.	Name	Extent of Mining Applied
1	Thiru.S.Gnanasekaran	2.37.0 ha
2	Thiru. S. Palanisamy	1.55.0 ha
3	Tvl. Palanivel Sri Blue Metals	1.75.5 ha
4	Thiru. P.Siddharthamouli	1.21.50 ha
5	Thiru.C.N.Mani	2.47.5 ha

CHIKKARAMPALAYAM ROUGH STONE & GRAVEL QUARRY – CLUSTER

"B1" CATEGORY – MINOR MINERAL – CLUSTER – NON-FOREST LAND

CLUSTER EXTENT = 31.64.5 ha

At

Chikkarampalayam Village, Mettupalayam Taluk, Coimbatore District

As per ToR obtained and MoEF & CC Deemed ToR Notification – S.O. 996(E) Dated: 10th April 2015, for the Projects in Cluster Situation – Cluster area is calculated as per MoEF & CC Notification – S.O. 2269 (E) Dated: 01.07.2016

- Letter No SEIAA- TN/F.No.7061/SEAC/ToR-759/2020 Dated: 24.09.2020 for P1;
- Letter No. SEIAA-TN/F.No. 7029/SEAC/ToR-782/2020 Dated:06.10.2020 for P2;
- Letter No. SEIAA-TN/F.No. 8000/SEAC/ToR-851/2020 Dated: 18.02.2021for P3;

.

Environmental Consultant

GEO EXPLORATION AND MINING SOLUTIONS

Old No. 260-B, New No. 17,
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* Calculated as per MoEF & CC Notification – S.O. 2269(E) Dated: 01.07.2016

1. INTRODUCTION

Rough Stone & Gravel is the major requirements for construction industry. This EIA report is prepared by considering Cumulative load of all proposed & existing quarries of Chikkarampalayam Rough Stone & Gravel Quarries Cluster consisting of 5 Proposed and 11 Existing Quarries with total extent of Cluster of.31.64.5 ha in Chikkarampalayam Village, Mettupalayam Taluk, Coimbatore District and Tamil Nadu State, cluster area calculated as per MoEF & CC Notification S.O. 2269(E) Dated 1st July 2016.

This EIA Report is prepared in compliance with ToR obtained vide –

- Letter No Lr.No. SEIAATN/F.No. 7061/SEAC/ToR-759/2020 Dated: 24.09.2020 for P1;
- Letter No. Lr.No. SEIAATN/F.No. 7029/SEAC/ToR-782/2020 Dated:06.10.2020 for P2;
- Letter No. Lr.No. SEIAATN/F.No. 8000/SEAC/ToR-851/2020 Dated: 18.02.2021 for P3;

The Baseline Monitoring study has been carried out during the period of December 2020 - February 2021 and this EIA and EMP report is prepared for considering cumulative impacts arising out of these projects, the Cumulative Environmental Impact Assessment study is undertaken, which is followed by preparation of a detailed Environmental Management Plan (EMP) individually to minimize those adverse impacts.

"Draft EIA report prepared on the basis of ToR Issued & Standard ToR for carrying out Public Hearing for the Grant of Environmental Clearance from SEIAA, - Tamil Nadu"

1.1 DETAILS OF PROJECT PROPONENT –

PROPOSAL – P1	
Name of the Project	Thiru. S.Gnanasekaran Rough stone and Gravel quarry
S.F. No.	74/2
Extent	2.37.0 ha
Land Type	Patta Land
Village Taluk and District	Chikkarampalayam Village, Mettupalayam Taluk, Coimbatore District
PROPOSAL – P2	
Name of the Project	Thiru. S.Palanisamy Rough stone and Gravel quarry
S.F. No.	435/2B2, 435/2C, 435/2D, 435/2B1 & 435/2E
Extent	1.55.0 ha
Land Type	Patta Land
Village Taluk and District	Chikkarampalayam Village, Mettupalayam Taluk, Coimbatore District
PROPOSAL – P3	
Name of the Project	Tvl.Palanivel sri Blue Metals India Pvt Ltd Rough stone and Gravel quarry
S.F. No.	428/1A, 60/1B & 61
Extent	1.75.5 ha
Land Type	Patta Land
Village Taluk and District	Chikkarampalayam Village, Mettupalayam Taluk, Coimbatore District
PROPOSAL – P4	
Name of the Project	Thiru. P.Siddharthamouli Rough stone and Gravel quarry
S.F. No.	76/1A
Extent	1.21.50 ha
Land Type	Patta Land
Village Taluk and District	Chikkarampalayam Village, Mettupalayam Taluk, Coimbatore District

1.2 QUARRY DETAILS WITHIN 500 M RADIUS

PROPOSED QUARRIES				
CODE	**Name of the Owner**	**S.F. Nos**	**Extent**	**Status**
P1	**Thiru. S.Gnanasekaran,** S/o. Samappagownder, No.2/241, Kannarapalayam, Karamadai, Coimbatore District.	74/2	2.37.0 ha	Tor obtained vide Lr.No.SEIAA-TN/F.No.7061/SEAC/ToR-759/2020 Dated: 24.09.2020
P2	**Thiru. S.Palanisamy,** S/o.Sammappagowder, 2/246, Kannarapalayam, Karamadai, Coimbatore District	435/2B2, 435/2C, 435/2D, 435/2B1 & 435/2E	1.55.0 ha	Tor obtained vide Lr.No.SEIAA-TN/F.No.7029/SEAC/ToR-782/2020 Dated:06.10.2020
P3	**Tvl.Palanivel sri Blue Metals India Pvt Ltd,** No.19, Gowthamapuri Nagar, V.K.Village, Thaneerpandal, Coimbatore District – 641 004	428/1A, 60/1B & 61	1.75.5 ha	Tor obtained vide Lr.No. SEIAA-TN/F.No.8000/SEAC/ToR-851/2020 Dated: 18.02.2021
P4	**Thiru. P.Siddharthamouli** S/o. Palanisamy, No.2/246, Kannarapalayam, Karamadai, Coimbatore.	76/1A	1.21.50 ha	Under examination of SEIAA
P5	**Thiru.C.N. Mani,** S/o. Nanjunda Gowder, 1/40, Chinnakkaranur, Bellathi (Post), Chikkarampalayam Panchayat, Mettupalayam Taluk, Coimbatore District.	75	2.47.5	Applied.
TOTAL			**9.36.5 ha**	
EXISTING QUARRIES				
CODE	**Name of the Owner**	**S.F. No**	**Extent**	**Status**
E1	**Tmt.M.Muthammal,** W/o, R.Mahendran, No.64G-Sirumugai road, Siva nagar, Karamadai, Mettupalayam taluk, Coimbatore.	77/2E, 77/2F, 79/1A	3.33.0	22.01.2016 to 21.01.2021
E2	**Thiru.C.N. Mani,** S/o. Nanjunda Gowder, 1/40, Chinnakkaranur, Bellathi (Post), Chikkarampalayam Panchayat, Mettupalayam Taluk, Coimbatore District.	77/1B, 421/2B	3.11.0	02.03.2016 to 01.03.2021
E3	**Thiru.R.K.Palanisamy**	341/3	4.02.0	01.06.2016 to 31.05.2021
E4	**Thiru.A.Nandhakumar**	78/1, 420	1.17.0	02.06.2016 to 01.06.2021
E5	**Thiru. R.Ganesan** S/o. Ramasamy gounder, C-7, Parsan Apartment, Nanjundapuram road, Ramanathapuram, Coimbatore District- 641104	462/2A, 2B,463/1, 463/2, 466/2B	1.91.5	17.09.2016 to 16.09.2021
E6	**Thiru.R.K.Selvakumar,** S/o. T.Karivaradhan, No.4/51, Ramampalayam, Jadayampalayam (Po), Mettupalayam taluk, Coimbatore.	69	2.19.0	17.10.2017 to 16.10.2022

E7	**Tmt.P.Bagiyavathy,** W/o.Palanisamy, No.9/1A, pongali mudaliyar street, K.N.P Road, Karamadai, Coimbatore – 641 104.	428/2, 429/1, 429/2	1.81.5	17.10.2017 to 16.10.2022
E8	**Thiru.S. Gnanasekaran,** S/o. Sammappa Gowder, No.2/241, KAnnarapalayam, Karamadai (Po), Mettupalayam taluk, Coimbatore district.	77/2D (P)	1.01.2	01.10.2018 to 30.09.2023
E9	**Technomax Building solution India Pvt Ltd** Thiru, R.Raju, (Managing director) No.1/382, Mettupalayam road, Mathampalayam, Press colony (PO), Coimbatore District – 641 019	345/3	1.45.8	26.10.2018 to 25.10.2023
E10	**Tmt.R.Poorani,** W/o. R.Rajamani, No.85/54, Kondasamy Naidu Nagar, Karamadai Post, Mettupalayam taluk, Coimbatore District.	80/1	1.27.0	22.12.2018 to 21.12.2023
E11	**Tmt.T.Kaveriammal,** W/o. Thangavelu, No.24/11, belladhi road, Karamadai, Coimbatore district	77/2B	0.99.0	24.12.2018 to 23.12.2023
TOTAL			**22.28 ha**	
TOTAL CLUSTER EXTENT			**31.64.5 ha**	

Source: i).AD Letter – Rc.No.328/Mines/2018, Dated: 28.07.2020
ii).AD Letter – Rc.No.634/Mines/2018, Dated: 24.09.2020
iii).AD Letter – Rc.No.329/Mines/2018, Dated: 08.04.2019
iv).AD Letter – Rc.No.501/Mines/2018, Dated: 08.04.2019

Note: -

- **The Precise area letter has been communicated and the mining plan is not yet prepared for project P5. Therefore, the project is considered for cluster calculation but not considered for cumulative impact as there are no on-going mining operations in quarry P5 during the Baseline Monitoring Period between Dec 2020 to Feb 2021.**
- **Cluster area is calculated as per MoEF & CC Notification – S.O. 2269 (E) Dated: 01.07.2016**

1.3 SALIENT FEATURES OF THE PROPOSAL

PROPOSAL – P1		
Name of the Quarry	Thiru. S.Gnanasekaran – Roughstone and Gravel quarry.	
Toposheet No	58-A/15	
Latitude between	$11^0$14'56.68"N to $11^0$15'02.95"N	
Longitude between	$76^0$58'47.23"E to $76^0$58'52.67"E	
Highest Elevation	354m AMSL	
Proposed Depth of Mining	22 m bgl (2m Gravel + 20m Rough Stone)	
Geological Resources	**Rough Stone in m^3**	**Gravel m^3**
	4,74,000	47,400
Mineable Reserves	**Rough Stone in m^3**	**Gravel m^3**
	2,76,500	38,236
Yearwise production	**Rough Stone in m^3**	**Gravel m^3**
	2,76,500	38,236
Ultimate Pit Dimension	167m (L) x 124m (W) x 22m (D)	
Water Level in the surrounds area	55 – 60 m bgl	
Method of Mining	Opencast Mechanized Mining Method involving drilling and blasting.	
Topography	The lease applied area is exhibits plain terrain. The area has gentle sloping towards South western side. The altitude of the area is 345 m (max) above mean sea level. The area is covered by 2 m thickness of Gravel Formation. Massive Charnockite is found after 2 m (Gravel Formation) which is clearly inferred from the nearby existing mine pit.	
Machinery proposed	Jack Hammer	5 Nos
	Compressor	1 Nos
	Hydraulic Excavator	2 Nos
	Tippers	3 Nos
Blasting Method	Controlled Blasting Method by shot hole drilling and small dia of 25mm slurry explosive are proposed to be used for shattering and heaving effect for removal and winning of Rough Stone. No deep hole drilling is proposed.	
Proposed Manpower Deployment	27 Nos	
Project Cost	Rs. 51,50,390/-	
CER Cost @ 2% of Project Cost	Rs. 1,03,008/-	
Nearby Water Bodies	Canal	160m West
	Belladhi Lake	580m North West
	Odai	700m East
	Odai	1.7km East
	Bhavani River	7km North
Greenbelt Development Plan	Proposed to plant 225 trees in 2,000 Sq.m area in the 7.5 m Safety Zone	
Proposed Water Requirement	4.0 KLD	
Nearest Habitation	520m South West	

Source: Approved Mining Plan

PROPOSAL – P2		
Name of the Quarry	Thiru. S.Palanisamy Rough Stone & Gravel Quarry	
Toposheet No	58-A/15	
Latitude between	$11^0$14'59.12"N to $11^0$15'04.96"N	
Longitude between	$76^0$59'35.03"E to $76^0$59'41.20"E	
Highest Elevation	350m AMSL	
Proposed Depth of Mining	27 m bgl (2 m Gravel + 25 m Rough Stone)	
Geological Resources	Rough Stone in m^3	Gravel m^3
	3,58,450	28,676
Mineable Reserves	Rough Stone in m^3	Gravel m^3
	81,738	11,496
Yearwise Production	Rough Stone in m^3	Gravel m^3

Existing pit dimension	100m (L) x86m (W) x 17m (D)bgl	
Ultimate Pit Dimension	134m (L) x 91m (W) x 27m(D) bgl	
Water Level in the surrounds area	55 – 60 m bgl	
Method of Mining	Opencast Mechanized Mining Method involving drilling and blasting	
Topography	The lease applied area is exhibits plain terrain. The area has gentle sloping towards Northeastern side. The altitude of the area is 350 m (max) above mean sea level. The area is covered by 2 m thickness of Gravel Formation. Massive Charnockite is found after 2 m (Gravel Formation) which is clearly inferred from the nearby existing quarrying pit.	
Machinery proposed	Jack Hammer	4 Nos
	Compressor	1 Nos
	Hydraulic Excavator	1 Nos
	Tippers	1 Nos
Blasting Method	Controlled Blasting Method by shot hole drilling and small dia of 25mm slurry explosive are proposed to be used for shattering and heaving effect for removal and winning of Rough Stone. No deep hole drilling is proposed.	
Proposed Manpower Deployment	18 Nos	
Project Cost	Rs. 27,07,850/-	
CER Cost @ 2% of Project Cost	Rs.54,157/-	
Nearby Water Bodies	Odai	220m North West
	Odai	390m South East
	Canal	1.5km North West
	Belladhi Lake	2km West
	Bhavani River	6.5km North
Greenbelt Development Plan	Proposed to plant 225 trees in 2,000 Sq.m area in the 7.5 m Safety Zone	
Proposed Water Requirement	3.5 KLD	
Nearest Habitation	550m South East	

Source: Approved Mining Plan

PROPOSAL – P3		
Name of the Quarry	Tvl. Palanivel Sri Blue Metals Roughstone and Gravel quarry	
Toposheet No	58-A/15	
Latitude between	$11^0$14’56.57”N to $11^0$15’01.71”N	
Longitude between	$76^0$59’18.29”E to $76^0$59’25.17”E	
Highest Elevation	365m AMSL	
Proposed Depth of Mining	47 m bgl (2 m Gravel + 45 m Rough Stone)	
Geological Resources	Rough Stone in m^3	Gravel m^3
	7,02,000	35,100
Mineable Reserves	Rough Stone in m^3	Gravel m^3
	1,29,689	7,038
Yearwise Production	Rough Stone in m^3	Gravel m^3
Existing pit dimension	101m (L) x 86m (W) x 15m (D) bgl	
Ultimate Pit Dimension	132m (L) x 86m (W) x 42m (D) bgl	
Water Level in the surrounds area	55 – 60 m bgl	
Method of Mining	Opencast Mechanized Mining Method involving drilling and blasting	
Topography	The lease applied area is exhibits plain terrain. The area has gentle sloping towards Northeastern side. The altitude of the area is 365 m (max) above mean sea level. The area is covered by 2 m thickness of Gravel Formation. Massive Charnockite is found after 2 m (Gravel Formation) which is clearly inferred from the nearby existing quarrying pit.	
Machinery proposed	Jack Hammer	5 Nos

	Compressor	1 Nos
	Hydraulic Excavator	1 Nos
	Tippers	2 Nos
Blasting Method	Controlled Blasting Method by shot hole drilling and small dia of 25mm slurry explosive are proposed to be used for shattering and heaving effect for removal and winning of Rough Stone. No deep hole drilling is proposed.	
Proposed Manpower Deployment	21 Nos	
Project Cost	Rs. 29,13,070/-	
CER Cost @ 2% of Project Cost	Rs.58,261/-	
Nearby Water Bodies	Odai	Adjacent Lease Area NW
	Odai	740m South East
	Canal	1km West
	Belladhi Lake	1.5km North West
	Bhavani River	7km North
Greenbelt Development Plan	Proposed to plant 225 trees in 2,000 Sq.m area in the 7.5 m Safety Zone	
Proposed Water Requirement	4.0 KLD	
Nearest Habitation	1 Km East	

Source: Approved Mining Plan

PROPOSAL – P4		
Name of the Quarry	Sidharthamouli Roughstone and Gravel quarry	
Toposheet No	58-A/15	
Latitude between	$11^0$15'01.72" N to $11^0$15'05.76"N	
Longitude between	$76^0$58'53.23"E to $76^0$58'59.11"E	
Highest Elevation	356m AMSL	
Proposed Depth of Mining	37 m bgl (2 m Gravel + 35 m Rough Stone)	
Geological Resources	Rough Stone in m^3	Gravel m^3
	4,25,250	24,300
Mineable Reserves	Rough Stone in m^3	Gravel m^3
	81,705	4,950
Yearwise production	Rough Stone in m^3	Gravel m^3
Existing pit Dimension	128m (L) x 53m (W) x 17m (D)	
Ultimate Pit Dimension	158m (L) x 57m (W) x 37m (D)	
Water Level in the surrounds area	55 – 60 m bgl	
Method of Mining	Opencast Mechanized Mining Method involving drilling and blasting	
Topography	The lease applied area is exhibits plain terrain. The area has gentle sloping towards northern side. The altitude of the area is 356 m (max) above mean sea level. The area is covered by 2 m thickness of Gravel Formation. Massive Charnockite is found after 2 m (Gravel Formation) which is clearly inferred from the nearby existing quarrying pit.	
Machinery proposed	Jack Hammer	3 Nos
	Compressor	1 Nos
	Hydraulic Excavator	1 Nos
	Tippers	1 Nos
Blasting Method	Controlled Blasting Method by shot hole drilling and small dia of 25mm slurry explosive are proposed to be used for shattering and heaving effect for removal and winning of Rough Stone. No deep hole drilling is proposed.	
Proposed Manpower Deployment	22 Nos	
Project Cost	Rs.24,86,355/-	
CER Cost @ 2% of Project Cost	Rs.49,727/-	
Nearby Water Bodies	Canal	380m West
	Odai	560m East
	Belladhi Lake	760m North West
	Odai	1.5km East

	Bhavani River	7km North
Greenbelt Development Plan	Proposed to plant 175 trees in 1,700 Sq.m area in the 7.5 m Safety Zone	
Proposed Water Requirement	3.0 KLD	
Nearest Habitation	800m South West	

Source: Approved Mining Plan

1.4 STATUTORY DETAILS

PROPOSAL – P1

- The proponent applied for Rough Stone and Gravel Quarry Lease Dated: 14.06.2018
- Precise Area Communication Letter was issued by the District Collector, Coimbatore Rc.No.328/Mines/2018, Dated: 11.01.2019
- The Mining Plan was prepared by Recognized Qualified Person and approved by Assistant Director, Geology and Mining, Coimbatore District, vide Rc.No.328/Mines/2018, Dated: 18.02.2019
- The proposed project falls under "B1" Category as per Order Dated: 04.09.2018 & 13.09.2018 passed by Hon'ble National Green tribunal, New Delhi in O.A. No. 173 of 2018 & O.A. No, 186 of 2016 and MoEF & CC Office Memorandum F. No. L-11011/175/2018-IA-II (M) Dated: 12.12.2018
- Proponent applied for ToR for Environmental Clearance vides online Proposal No. SIA/TN/MIN/36228/2019 Date: 24.09.2020

PROPOSAL – P2

- The proponent applied for Rough Stone and Gravel Quarry Lease Dated: 14.06.2018
- Precise Area Communication Letter was issued by the District Collector, Coimbatore R.C.No.329/Mines/2018 Dated :11.01.2019
- The Mining Plan was prepared by Recognized Qualified Person and approved by Assistant Director, Geology and Mining, coimbatore District, vide R.C.No.329/Mines/2018 Dated :04.02.2019
- The proposed project falls under "B1" Category as per Order Dated: 04.09.2018 & 13.09.2018 passed by Hon'ble National Green tribunal, New Delhi in O.A. No. 173 of 2018 & O.A. No, 186 of 2016 and MoEF & CC Office Memorandum F. No. L-11011/175/2018-IA-II (M) Dated: 12.12.2018
- Proponent applied for ToR for Environmental Clearance vides online Proposal No. SIA/TN/MIN/36222/2019 Date: 14.05.2019

PROPOSAL – P3

- The proponent applied for Rough Stone and Gravel Quarry Lease Dated: 15.10.2018
- Precise Area Communication Letter was issued by the District Collector, Coimbatore R.C.No:634/Mines/2018 Dated :11.01.2019
- The Mining Plan was prepared by Recognized Qualified Person and approved by Assistant Director, Geology and Mining, Coimbatore District, vide R.C.No:634/Mines/2018 Dated :05.02.2019
- The proposed project falls under "B1" Category as per Order Dated: 04.09.2018 & 13.09.2018 passed by Hon'ble National Green tribunal, New Delhi in O.A. No. 173 of 2018 & O.A. No, 186 of 2016 and MoEF & CC Office Memorandum F. No. L-11011/175/2018-IA-II (M) Dated: 12.12.2018
- Proponent applied for ToR for Environmental Clearance vides online Proposal No. SIA/TN/MIN/57772/2020 Date: 26.10.2020

PROPOSAL – P4

- The proponent applied for Rough Stone and Gravel Quarry Lease Dated: 15.10.2018
- Precise Area Communication Letter was issued by the District Collector, Coimbatore Rc.No.501/Mines/2018, Dated: 11.01.2019
- The Mining Plan was prepared by Recognized Qualified Person and approved by Assistant Director, Geology and Mining, Coimbatore District, vide Rc.No.501/Mines/2018, Dated: 28.01.2019
- The proposed project falls under "B1" Category as per Order Dated: 04.09.2018 & 13.09.2018 passed by Hon'ble National Green tribunal, New Delhi in O.A. No. 173 of 2018 & O.A. No, 186 of 2016 and MoEF & CC Office Memorandum F. No. L-11011/175/2018-IA-II (M) Dated: 12.12.2018
- Proponent applied for ToR for Environmental Clearance vides online Proposal No. SIA/TN/MIN/36220/2019 Date: 19.03.2020

2. PROJECT DESCRIPTION

The proposed projects are site specific and there is no additional area required for this project. There is no effluent generation/discharge from the proposed quarries.

Method is mining is common for all the proposed quarries in the cluster. Rough Stone is proposed to be excavated by opencast mechanized method involving 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 the needy crushers and rock breakers to avoid secondary blasting.

2.1 SITE CONNECTIVITY TO THE PROJECT AREA

Nearest Roadway	The Nearest National Highway (NH-67) Coimbatore – Ooty – 2.5Km SW The State Highway (SH-168) Karamadai – Annur – 1.5Km-S.
Nearest Village	SH-168 Karamadai – Annur – 1.5Km-S
Nearest Town	Karamadai – 2.3 km –South West
Nearest Railway	Mettupalayam – 7.0 km – North West Side
Nearest Airport	Coimbatore –25.0 km – South side
Seaport	Kochi- 166 km – South West

2.2 LAND USE PATTERN OF THE LEASE APPLIED AREA

LAND USE PATTERN OF PROJECT – P1		
Description	**Present area in (ha)**	**Area at the end of life of quarry (Ha)**
Area under quarry	Nil	1.95.0
Infrastructure	Nil	0.01.0
Roads	Nil	0.02.0
Green Belt	Nil	0.20.0
Un – utilized area	2.37.0	0.19.0
Grand Total	**2.37.0**	**2.37.0**
LAND USE PATTERN OF PROJECT – P2		
Description	**Present area in (ha)**	**Area at the end of life of quarry (Ha)**
Area under quarry	0.48.6	1.07.5
Infrastructure	Nil	0.01.0
Roads	0.02.0	0.02.0
Green Belt	Nil	0.20.0
Un – utilized area	1.04.4	0.24.5
Grand Total	**1.55.0**	**1.55.0**
LAND USE PATTERN OF PROJECT – P3		
Description	**Present area in (ha)**	**Area at the end of life of quarry (Ha)**
Area under quarry	0.76.2	1.23.0
Infrastructure	Nil	0.01.0
Roads	0.01.0	0.02.0
Green Belt	Nil	0.20.0
Un – utilized area	0.95.3	0.29.5
Grand Total	**1.75.5**	**1.75.5**
LAND USE PATTERN OF PROJECT – P4		
Description	**Present area in (ha)**	**Area at the end of life of quarry (Ha)**
Area under quarry	0.59.4	0.85.9
Infrastructure & Road	Nil	0.01.0
Fencing	0.02.0	0.02.0
Green Belt	Nil	0.17.0
Unutilized area	0.06.1	0.15.6
Grand Total	**1.21.5**	**1.21.5**

Source: Approved Mining Plans of respective Proposals

2.3 OPERATIONAL DETAILS OF LEASE APPLIED AREA

OPERATIONAL DETAILS FOR PROJECT – P1		
PARTICULARS	**DETAILS**	
	Rough Stone (5Year Plan period)	**Gravel (3 Years Plan period)**
Geological Resources	**4,74,000**	47,400
Mineable Reserves	**2,76,500**	38,236
Production for five year plan period	2,76,500	38,236
Mining Plan Period	5 Years	
Number of Working Days	300 Days	
Production per day	**184**	42
No of Lorry loads ($6m^3$ per load)	**31**	7
Total Depth of Mining	22m bgl	

OPERATIONAL DETAILS FOR PROJECT – P2		
PARTICULARS	**DETAILS**	
	Rough Stone (5Year Plan period)	**Gravel (3Year Plan period)**
Geological Resources	3,58,450	28,676
Mineable Reserves	81,738	11,496
Production for five year plan period	81,738	11,496
Mining Plan Period	5 years	
Number of Working Days	300 days	
Production per day	54	13
No of Lorry loads ($6m^3$ per load)	9	2
Total Depth of Mining	27m bgl	

OPERATIONAL DETAILS FOR PROJECT – P3		
PARTICULARS	**DETAILS**	
	Rough Stone (5Year Plan period)	**Gravel (1 Years Plan period)**
Geological Resources	**7,02,000**	35,100
Mineable Reserves	**1,29,689**	7,038
Production for five year plan period	**1,21,194**	7,038
Mining Plan Period / Lease Applied Period	5 Years	
Number of Working Days	300 Days	
Production per day	**81**	23
No of Lorry loads ($6m^3$ per load)	**14**	4
Proposed Depth for Mining Plan Period	**40m**	2m
Total Depth of Mining	42m bgl	

OPERATIONAL DETAILS FOR PROJECT – P4		
PARTICULARS	**DETAILS**	
	Rough Stone (5Year Plan period)	**Gravel (3 Years Plan period)**
Geological Resources	**4,25,250**	24,300
Mineable Reserves	**81,705**	4,950
Production for five year plan period	**81,705**	4,950
Mining Plan Period / Lease Applied Period	5 years	
Number of Working Days	300 days	
Production per day	**54**	6
No of Lorry loads ($6m^3$ per load)	**9**	1
Total Depth of mining	37m bgl	

.Source:Respective Ps

2.4 YEAR-WISE PRODUCTION PLAN

PROPOSAL – P1		
YEAR	**ROUGH STONE (m^3)**	**GRAVEL (m^3)**
I	53,600	13,104
II	58,400	14,152
III	49,950	10,980
IV	60,400	-
V	54,150	-
TOTAL	**2,76,500**	**38,236**
PROPOSAL – P2		
YEAR	**ROUGH STONE (m^3)**	**GRAVEL (m^3)**
I	15,550	2,016
II	16,720	4,104
III	19,250	5,376
IV	17,328	-
V	12,890	-
TOTAL	**81,738**	**11,496**
PROPOSAL – P3		
YEAR	**ROUGH STONE (m^3)**	**GRAVEL (m^3)**
I	23,815	7,326
II	20,820	-
III	23,284	-
IV	34,085	-
V	14,630	-
TOTAL	**1,16,634**	**7,326**
PROPOSAL – P4		
YEAR	**ROUGH STONE (m^3)**	**GRAVEL (m^3)**
I	16,855	1,870
II	17,675	1,100
III	14,225	1,980
IV	16,500	-
V	16,450	-
TOTAL	**81,705**	**4,950**

Source: Approved Mining Plan

FIGURE – 1: GOOGLE IMAGE SHOWING APPLIED QUARRY LEASE AREA – P1

FIGURE – 2: GOOGLE IMAGE SHOWING APPLIED QUARRY LEASE AREA – P2

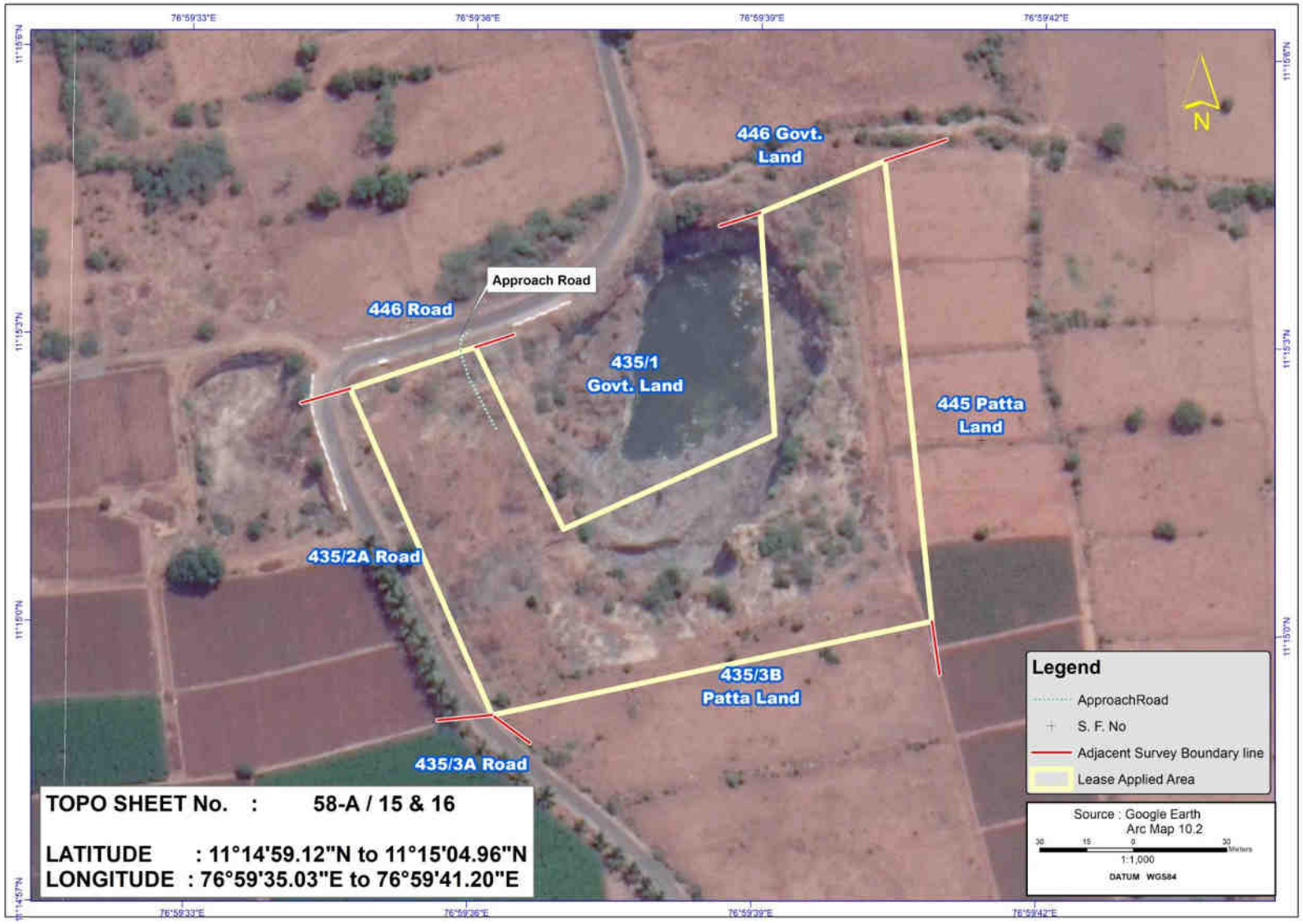


FIGURE – 3: GOOGLE IMAGE SHOWING APPLIED QUARRY LEASE AREA – P3

FIGURE – 4: GOOGLE IMAGE SHOWING APPLIED QUARRY LEASE AREA – P4

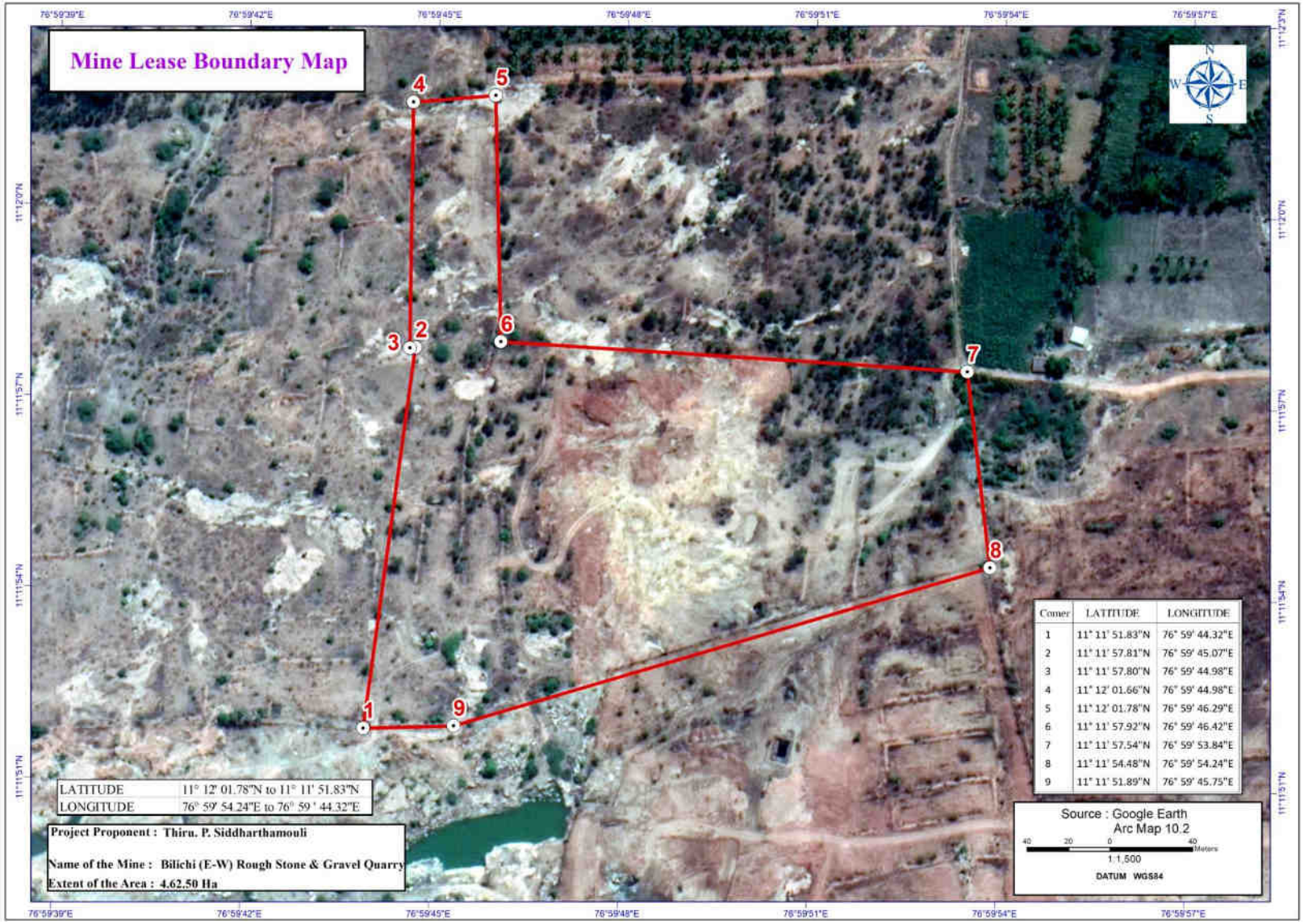
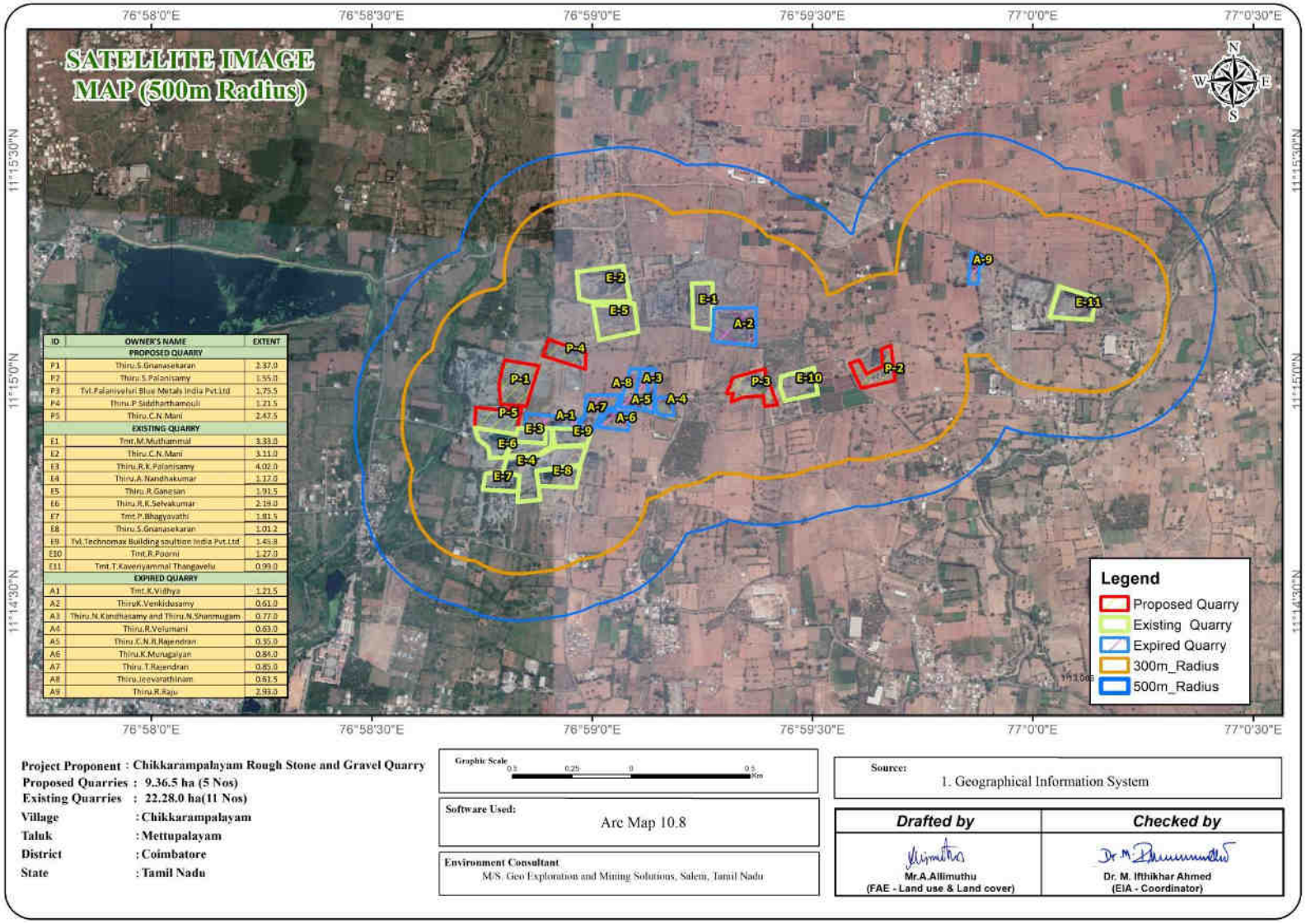


FIGURE – 5: GOOGLE IMAGE SHOWING APPLIED QUARRY LEASE AREA – P5

FIGURE – 6: GOOGLE IMAGE SHOWING CLUSTER (500 m QUARRIES)



ID	OWNER'S NAME	EXTENT
	PROPOSED QUARRY	
P1	Thiru.S.Gnanasekaran	2.37.0
P2	Thiru.S.Palanisamy	1.55.0
P3	Tvl.Palaniyelvi Blue Metals India Pvt.Ltd	1.75.5
P4	Thiru.P.Siddharthamouli	1.21.5
P5	Thiru.C.N.Mani	2.47.5
	EXISTING QUARRY	
E1	Tmt.M.Muthammal	3.33.0
E2	Thiru.C.N.Mani	3.11.0
E3	Thiru.R.K.Palanisamy	4.02.0
E4	Thiru.A.Nandhakumar	1.17.0
E5	Thiru.R.Ganesan	1.91.5
E6	Thiru.R.K.Selvakumar	2.19.0
E7	Tmt.P.Bhagyavathi	1.81.5
E8	Thiru.S.Gnanasekaran	1.01.2
E9	Tvl.Technomax Building soultion India Pvt.Ltd	1.45.8
E10	Tmt.R.Poorni	1.27.0
E11	Tmt.T.Kaveriyammal Thangavelu	0.99.0
	EXPIRED QUARRY	
A1	Tmt.R.Vidhya	1.21.5
A2	ThiruK.Venkidusamy	0.61.0
A3	Thiru.N.Kandhasamy and Thiru.N.Shanmugam	0.77.0
A4	Thiru.R.Velumani	0.63.0
A5	Thiru.C.N.R.Rajendran	0.35.0
A6	Thiru.K.Murugaiyan	0.84.0
A7	Thiru.T.Rajendran	0.85.0
A8	Thiru.Jeavarathinam	0.61.5
A9	Thiru.R.Raju	2.93.0

Project Proponent : Chikkarampalayam Rough Stone and Gravel Quarry
Proposed Quarries : 9.36.5 ha (5 Nos)
Existing Quarries : 22.28.0 ha(11 Nos)
Village : Chikkarampalayam
Taluk : Mettupalayam
District : Coimbatore
State : Tamil Nadu

Graphic Scale 0.5 0.25 0 0.5 Km

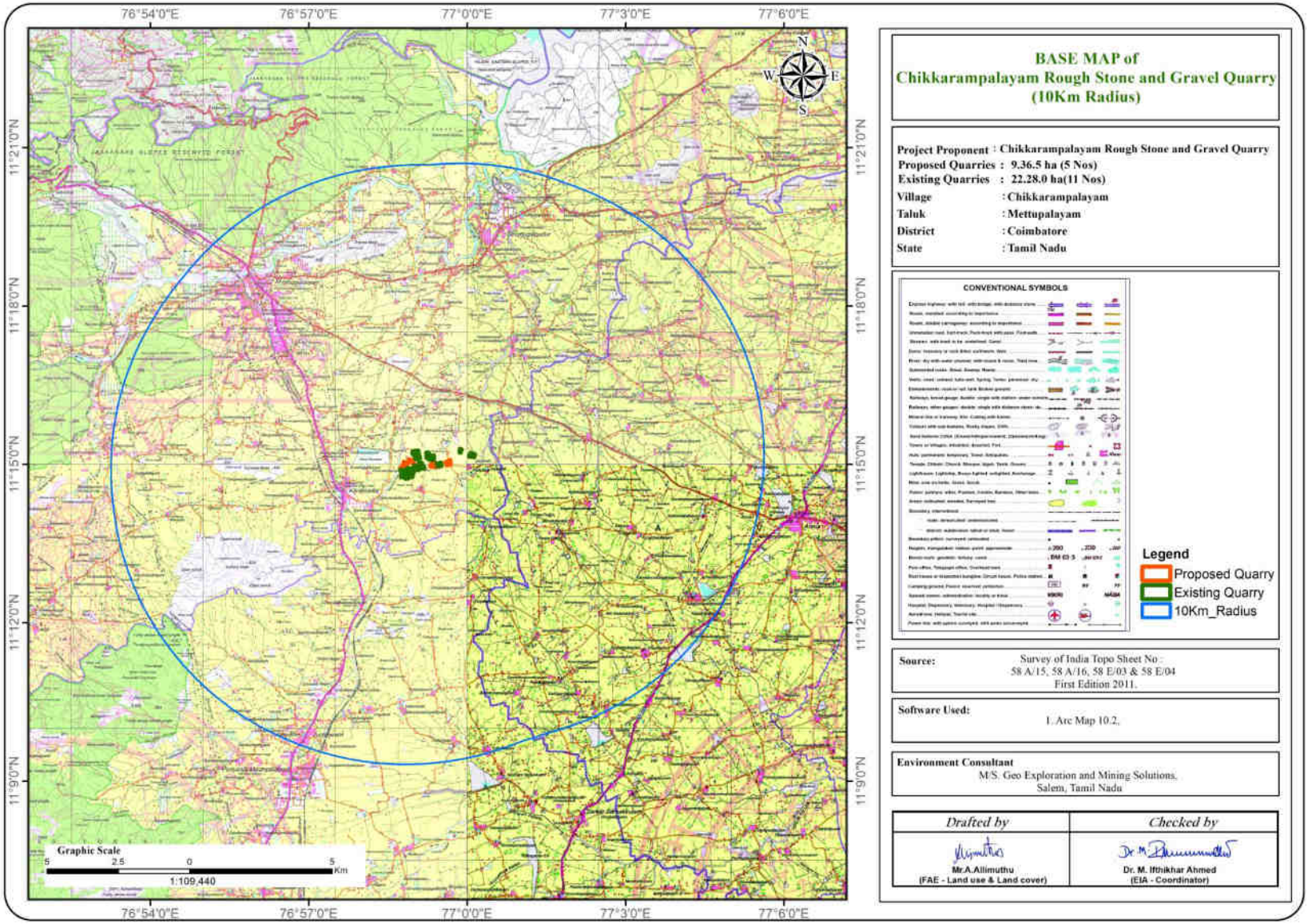
Source: 1. Geographical Information System

Software Used: Arc Map 10.8

Environment Consultant
M/S. Geo Exploration and Mining Solutions, Salem, Tamil Nadu

Drafted by	Checked by
Mr.A.Allimuthu (FAE - Land use & Land cover)	Dr. M. Ifthikhar Ahmed (EIA - Coordinator)

FIGURE – 7: TOPOSHEET MAP COVERING 10 KM RADIUS



2.5 METHOD OF MINING

- Proposed Method of Mining is common for all the Proposed Projects – The method of mining is Opencast Mechanized Mining Method is being proposed by formation of 5.0 meter height bench with a bench width not less than the bench height.

The Rough Stone is a batholith formation and the splitting of rock mass of considerable volume from the parent rock mass will be carried out by deploying jackhammer drilling and Slurry Explosives will be used for blasting. Hydraulic Excavators attached with Rock Breakers unit will be deployed for breaking large boulders to required fragmented sizes to avoid secondary blasting and hydraulic excavators attached with bucket unit will be deployed for loading the Rough Stone into the tippers and then the stone is transported from pithead to the nearby crushers.

2.6 PROPOSED MACHINERY DEPLOYMENT

PROPOSAL – P1				
S.NO.	**TYPE**	**NOS**	**SIZE/CAPACITY**	**MOTIVE POWER**
1	Jack hammers	5	1.2m to 2.0m	Compressed air
2	Compressor	1	400psi	Diesel Drive
3	Excavator with Bucket / Rock Breaker Unit 4	2	300 HP	Diesel Drive
4	Tippers / Dumpers	3	20 Tonnes	Diesel Drive
PROPOSAL – P2				
S.NO.	**TYPE**	**NOS**	**SIZE/CAPACITY**	**MOTIVE POWER**
1	Jack hammers	4	1.2m to 2.0m	Compressed air
2	Compressor	1	400psi	Diesel Drive
3	Excavator with Bucket / Rock Breaker Unit 4	1	300 HP	Diesel Drive
4	Tippers / Dumpers	1	20 Tonnes	Diesel Drive
PROPOSAL – P3				
S.NO.	**TYPE**	**NOS**	**SIZE/CAPACITY**	**MOTIVE POWER**
1	Jack hammers	5	1.2m to 2.0m	Compressed air
2	Compressor	1	400psi	Diesel Drive
3	Excavator with Bucket / Rock Breaker Unit 4	1	300 HP	Diesel Drive
4	Tippers / Dumpers	2	20 Tonnes	Diesel Drive
PROPOSAL – P4				
S.NO.	**TYPE**	**NOS**	**SIZE/CAPACITY**	**MOTIVE POWER**
1	Jack hammers	3	1.2m to 2.0m	Compressed air
2	Compressor	1	400psi	Diesel Drive
3	Excavator with Bucket / Rock Breaker Unit 4	1	300 HP	Diesel Drive
4	Tippers / Dumpers	1	20 Tonnes	Diesel Drive

Source: Approved Mining Plans

2.7 CONCEPTUAL MINING PLAN/ FINAL MINE CLOSURE PLAN

- At the end of life of mine, the excavated mine pit / void will act as artificial reservoir for collecting rain water and helps to meet out the demand or crises during drought season.
- After mine closure the greenbelt developed along the safety barrier and top benches and temporary water reservoir will enhance the ecosystem
- Mine Closure is a process of returning a disturbed site to its natural state or which prepares it for other productive uses that prevents or minimizes any adverse effects on the environment or threats to human health and safety.
- The principle closure objectives are for rehabilitated mines to be physically safe to humans and animals, geo-technically stable, geo-chemically non-polluting/ non-contaminating, and capable of sustaining an agreed post-mining land use.

2.8 ULTIMATE PIT DIMENSION

PROPOSAL – P1			
Pit	**Length (Max) (m)**	**Width (Max) (m)**	**Depth (Max)**
I	167	124	22
PROPOSAL – P2			
Pit	**Length (Max) (m)**	**Width (Max) (m)**	**Depth (Max)**
I	134	91	27 m bgl
PROPOSAL – P3			
Pit	**Length (Max) (m)**	**Width (Max) (m)**	**Depth (Max)**
I	132	86	30 m bgl
PROPOSAL – P4			
Pit	**Length (Max) (m)**	**Width (Max) (m)**	**Depth (Max)**
I	158	57	37 m bgl

Source: Approved Mining Plan

3. DESCRIPTION OF THE ENVIRONMENT

Field monitoring studies to evaluate the base line status of the project site were carried out during December 2020 to February 2021 as per CPCB guidelines. Environmental Monitoring data has been collected with reference to proposed mine by OMEGAA LABORATORIES ISO 9001: 2008, OHSAS 18001: 2007 Certified & MoEF Notified Laboratory

3.1 ENVIRONMENT MONITORING ATTRIBUTES

Sl.No.	**Attributes**	**Parameters**	**Source and Frequency**
1	Ambient Air Quality	PM_{10}, $PM_{2.5}$, SO_2, NO_2	Continuous 24-hourly samples twice a week for three months at 9 locations (2 Core & 7 Buffer)
2	Meteorology	Wind speed and direction, temperature, relative humidity and rainfall	Near project site continuous for three months with hourly recording and from secondary sources of IMD station
3	Water quality	Physical, Chemical and Bacteriological parameters	Grab samples were collected at 6 locations – 2 ground water and 4 surface water samples; once during study period.
4	Ecology	Existing terrestrial and aquatic flora and fauna within 10 km radius circle.	Limited primary survey and secondary data was collected from the Forest department.
5	Noise levels	Noise levels in dB(A)	7 locations – data monitored once for 24 hours during EIA study
6	Soil Characteristics	Physical and Chemical Parameters	Once at 5 locations during study period
7	Land use	Existing land use for different categories	Based on Survey of India topographical sheet and satellite imagery and primary survey.
8	Socio-Economic Aspects	Socio-economic and demographic characteristics, worker characteristics	Based on primary survey and secondary sources data like census of India 2011.

9	Hydrology	Drainage pattern of the area, nature of streams, aquifer characteristics, recharge and discharge areas	Based on data collected from secondary sources as well as hydro-geology study report prepared.
10	Risk assessment and Disaster Management Plan	Identify areas where disaster can occur by fires and explosions and release of toxic substances	Based on the findings of Risk analysis done for the risk associated with mining.

Source: Field Monitoring Data

The data has been collected as per the requirement of the ToR issued by SEIAA – TN.

3.2 LAND ENVIRONMENT

S.No	CLASSIFICATION	AREA_Ha	Area_%
1	Builtup-Urban	1308.83	3.48
2	Decidious Forest	1226.9	3.26
3	Evergreen Forest	277.979	0.74
4	Scrub Land	2238.48	5.96
5	Scrub Forest	392.19	1.04
6	Mining Area	336.875	0.89
7	Crop Land	13905.3	37
8	Fallow Land	13099.1	34.8
9	Agricultural Land	2887.21	7.68
10	Builtup-Rural	1407.69	3.74
11	Water Bodies	178.5	0.47
12	River	287.005	0.76
	Total area	**37546.1**	**100**

The total mining area within the study area is 336.87.5 ha i.e., 0.89%. The cluster area of 31.64.5 ha contributes about 9.39% of the total mining area within the study area. This small percentage of Mining Activities shall not have any significant impact on the environment.

3.3 SOIL ENVIRONMENT

Physical Characteristics –

The physical properties of the soil samples were examined for texture, bulk density, porosity and water holding capacity. The soil texture found in the study area is Clay to Sandy Loam Soil and Bulk Density of Soils in the study area varied between 1.24 – 1.47 g/cc. The Water Holding Capacity and Porosity of the soil samples is found to be medium i.e. ranging from 32.8 – 43.8 %.

Chemical Characteristics –

- The nature of soil is slightly alkaline to strongly alkaline with pH range 7.22 to 8.73
- The available Nitrogen content range between 133 to 153 kg/ha
- The available Phosphorus content range between 26.5 to 43.4 kg/ha
- The available Potassium range between 27.5 to 43.2 mg/kg

3.4 WATER ENVIRONMENT

Surface Water

Ph:

The pH varied from 7.25 to 7.56 while turbidity found within the standards (Optimal pH range for sustainable aquatic life is 6.5 to 8.5 pH).

Total Dissolved Solids:

Total Dissolved Solids varied from 324 to 370 mg/l, the TDS mainly composed of carbonates, bicarbonates, Chlorides, phosphates and nitrates of calcium, magnesium, sodium and other organic matter.

Other parameters:

Chloride content is 70.6 – 79.4 mg/l. Nitrates varied from 12.6 to 14.2 mg/l, while sulphates varied from 25.3 to 27 mg/l.

Ground Water

The pH of the water samples collected ranged from 7.14 to 7.49 and within the acceptable limit of 6.5 to 8.5. pH, Sulphates and Chlorides of water samples from all the sources are within the limits as per the Standard. On Turbidity, the water samples meet the requirement. The Total Dissolved Solids were found in the range of 227 - 516 mg/l in all samples. The Total hardness varied between 166 – 269 mg/l for all samples.

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

3.5 AIR ENVIRONMENT

The baseline studies on air environment include identification of specific air pollution parameters and their existing levels in ambient air. The ambient air quality with respect to the study zone of 10 km radius around the proposed quarry forms the baseline information.

FIGURE – 14: WIND ROSE DIAGRAM

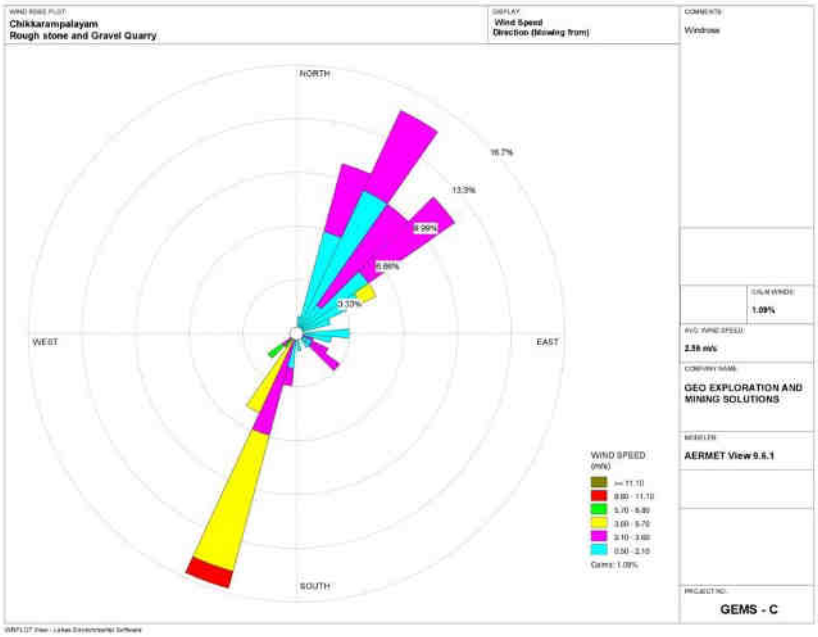
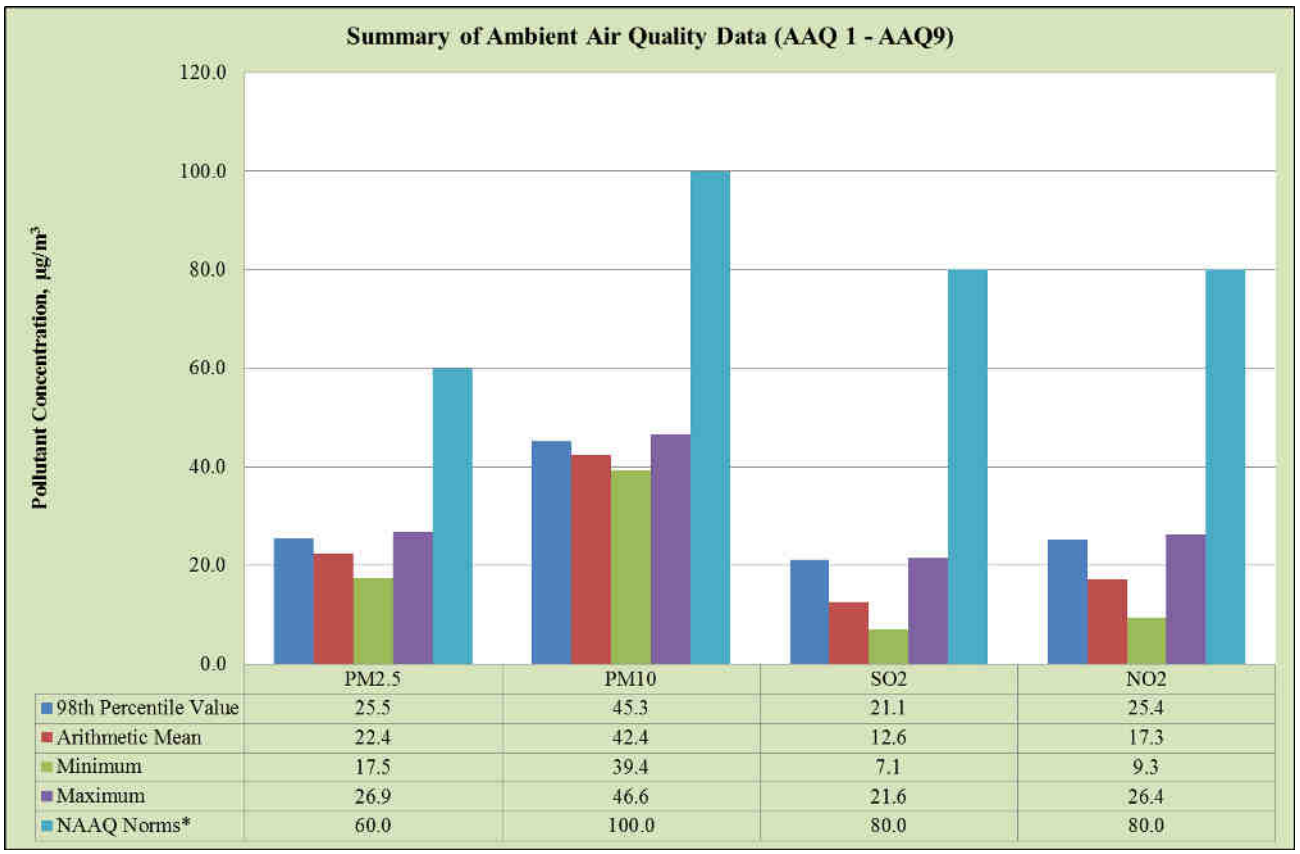


FIGURE – 15: SUMMARY OF AMBIENT AIR QUALITY DATA



	PM2.5	PM10	SO2	NO2
98th Percentile Value	25.5	45.3	21.1	25.4
Arithmetic Mean	22.4	42.4	12.6	17.3
Minimum	17.5	39.4	7.1	9.3
Maximum	26.9	46.6	21.6	26.4
NAAQ Norms*	60.0	100.0	80.0	80.0

The results of ambient air quality monitoring for the period (December 2020 to February 2021) are presented in the report. Data has been complied for three months.

As per monitoring data, PM_{10} ranges from 39.4 µg/m^3 to 46.6 µg/m^3, $PM_{2.5}$ data ranges from 17.5 µg/m^3 to 26.9 µg/m^3, SO_2 ranges from 7.1 µg/m^3 to 21.6 µg/m^3 and NO_2 data ranges from 9.3 µg/m^3 to 26.4 µg/m^3. The concentration levels of the above criteria pollutants were observed to be well within the limits of NAAQS prescribed by CPCB.

3.6 NOISE ENVIRONMENT

Ambient noise levels were measured at 7 (Seven) locations around the proposed project area. Noise levels recorded in core zone during day time were from 41.8 to 42.3 dB (A) Leq and during night time were from 38.1 to 38.6 dB (A) Leq. Noise levels recorded in buffer zone during day time were from 39.1 to 42.8 dB (A) Leq and during night time were from 38 to 39.6 dB (A) Leq.

3.7 ECOLOGICAL ENVIRONMENT

The study involved in the collection of primary data by conducting a survey in the field, examination of floral and faunal records in previously published reports and records. Analysis of the information is the view of the possible alteration in the environment of the project site. For the survey of fauna, both direct and indirect observation methods were used.

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

3.8 SOCIO ECONOMIC ENVIRONMENT

It includes demographic structure of the area, provision of basic amenities viz., housing, education, health and medical services, occupation, water supply, sanitation, communication, transportation, prevailing diseases pattern as well as feature like temples, historical monuments etc., at the baseline level. This will help in visualizing and predicting the possible impact depending upon the nature and magnitude of the project.

The socio economic study of surveyed villages gives a clear picture of its population, average household size, literacy rate and sex ratio etc. It is also found that a part of population is suffering from lack of permanent job to run their day to day life. Their expectation is to earn some income for their sustainability on a long-term basis.

The proposed projects will aim to provide preferential employment to the local people there by improving the employment opportunity in the area and in turn the social standards will improve.

4. ANTICIPATED ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES – IN COMMON FOR ALL PROPOSED QUARRIES (P1 – P5)

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 sustainable resource extraction.

4.1 LAND ENVIRONMENT:

ANTICIPATED IMPACT

- Permanent or temporary change on land use and land cover.
- Change in Topography: Topography of the ML area will change at the end of the life of the mine.
- Movement of heavy vehicles sometimes cause problems to agricultural land, human habitations due to dust, noise and it also causes traffic hazards.
- Due to degradation of land by pitting the aesthetic environment of the core zone may be affected.
- Earthworks during the rainy season increase the potential for soil erosion and sediment laden water entering the water ways.

If no due care is taken wash off from the exposed working area may choke the water course & can also causes the siltation of water course.

MITIGATION MEASURES

- The mining activity will be gradual confined in blocks and excavation will be undertaken progressively along with other mitigative measures like phase wise development of greenbelt etc.
- Construction of garland drains all around the quarry pits and construction of check dam at strategic location in lower elevations to prevent soil erosion due to surface runoff during rainfall and also to collect the storm water for various uses within the proposed area
- Green belt development along the boundary within safety zone. The small quantity of water stored in the mined out pit will be used for greenbelt
- Thick plantation will be carried out on unutilized area, top benches of mined out pits, on safety barrier, etc.,
- At conceptual stage, the land use pattern of the quarry will be changed into Greenbelt area and temporary reservoir
- In terms of aesthetics, natural vegetation surrounding the quarry will be retained (such as in a buffer area i.e., 7.5 m safety barrier and other safety provided) so as to help minimise dust emissions.
- Proper fencing will be carried out at the conceptual stage, Security will be posted round the clock, to prevent inherent entry of the public and cattle.

4.2 WATER ENVIRONMENT

ANTICIPATED IMPACT

- The major sources of water pollution normally associated due to mining and allied operations are:
  - Generation of waste water from vehicle washing.
  - Washouts from surface exposure or working areas
  - Domestic sewage
  - Disturbance to drainage course in the project area
  - Mine Pit water discharge
- Increase in sediment load during monsoon in downstream of lease area
- This being a mining project, there will be no process effluent. Waste from washing of machinery may result in discharge of Oil & grease, suspended solids.
- The sewage from soak pit may percolate to the ground water table and contaminate it.
- Surface drainage may be affected due to Mining
- Abstraction of water may lead to depletion of water table.

MITIGATION MEASURES

- Garland drains, settling tank will be constructed along the individual mining leases. The Garland drains of the individual leases will be connected to settling tank and after settling the water will be discharged out to the natural drainage
- Rainwater will be collected in sump in the mining pits and will be allowed to store and pumped out to surface setting tank of 15 m x 10m x 3m to remove suspended solids if any. This collected water will be judiciously used for dust suppression onwards and such sites where dust likely to be generated and for developing green belt. The proponent will collect and judicially utilize the rainwater as part of rainwater harvesting
- Providing benches with inner slopes and through a system of drains and channels, allowing rain water to descent into surrounding drains, so as to minimize the effects of erosion & water logging arising out of uncontrolled descent of water.
- Reuse the water collected during storm for dust suppression and greenbelt development within the mines
- Installing interceptor traps/oil separators to remove oils and greases. Water from the tipper wash-down facility and machinery maintenance yard will pass through interceptor traps/oil separators prior to its reuse;
- Using flocculating or coagulating agents to assist in the settling of suspended solids during monsoon seasons;
- Periodic analysis of quarry pit water and ground water quality in nearby villages.
- Domestic sewage from site office & urinals/latrines provided in ML is discharged in septic tank followed by soak pits.
- Waste water discharge from mine will be treated in settling tanks before using for dust suppression and tree plantation purposes.
- De-silting will be carried out before and immediately after the monsoon season.
- Regular monitoring and analysing the quality of water in open well, bore wells and surface water

4.3 AIR ENVIRONMENT

ANTICIPATED IMPACT

- During mining, at various stages activities such as excavation, drilling, blasting, and transportation of materials, particular matter (PM), gases such as Sulphur dioxide, oxides of Nitrogen from vehicular exhaust are the main air pollutants.
- Emissions of noxious gases due to incomplete detonation of explosive may sometimes pollute the air.
- The fugitive dust released from the mining operations may cause effect on the mine workers who are directly exposed to the fugitive dust.
- Simultaneously, the air-borne dust may travel to longer distances and settle in the villages located near the mine lease area.

MITIGATION MEASURES

Drilling – To control dust at source, wet drilling will be practiced. Where there is a scarcity of water, suitably designed dust extractor will be provided for dry drilling along with dust hood at the mouth of the drill-hole collar.

Advantages of Wet Drilling:-

- In this system dust gets suppressed close to its formation. Dust suppression become very effective and the work environment will be improved from the point of occupational comfort and health.
- Due to dust free atmosphere, the life of engine, compressor etc., will be increased.
- The life of drill bit will be increased.
- The rate of penetration of drill will be increased.
- Due to the dust free atmosphere visibility will be improved resulting in safer working conditions.

Blasting –

- Establish time of blasting to suit the local conditions and water sprinkling on blasting face
- Avoid blasting i.e., when temperature inversion is likely to occur and strong wind blows towards residential areas
- Controlled blasting include Adoption of suitable explosive charge and short delay detonators, adequate stemming of holes at collar zone and restricting blasting to a particular time of the day i.e. at the time lunch hours, controlled charge per hole as well as charge per round of hole
- Before loading of material water will be sprayed on blasted material
- Dust mask will be provided to the workers and their use will be strictly monitored

Haul Road & Transportation –

- Water will be sprinkled on haul roads twice a day to avoid dust generation during transportation
- Transportation of material will be carried out during day time and material will be covered with taurpaulin
- The speed of tippers plying on the haul road will be limited below 20 km/hr to avoid generation of dust.
- Water sprinkling on haul roads & loading points will be carried out twice a day
- Main source of gaseous pollution will be from vehicle used for transportation of mineral; therefore weekly maintenance of machines improves combustion process & makes reduction in the pollution.
- The un-metalled haul roads will be compacted weekly before being put into use.
- Over loading of tippers will be avoided to prevent spillage.
- It will be ensured that all transportation vehicles carry a valid PUC certificate
- Grading of haul roads and service roads to clear accumulation of loose materials.

Green Belt –

- Planting of trees all along main mine haul roads and regular grading of haul roads will be practiced to prevent the generation of dust due to movement of dumpers/trucks
- Green belt of adequate width will be developed around the project areas

Occupational Health –

- Dust mask will be provided to the workers and their use will be strictly monitored
- Annual medical check-ups, trainings and campaigns will be arranged to ensure awareness about importance of wearing dust masks among all mine workers & tipper drivers
- Ambient Air Quality Monitoring will be conducted six month once to assess effectiveness of mitigation measures proposed

4.4 NOISE ENVIRONMENT

ANTICIPATED IMPACT

Noise pollution poses a major health risk to the mine workers. Following are the sources of noise in the existing open cast mine project are being observed such as Drilling, & Blasting, Loading and during movement of vehicles.

MITIGATION MEASURES

- Usage of sharp drill bits while drilling which will help in reducing noise;
- Secondary blasting will be totally avoided and hydraulic rock breaker will be used for breaking boulders;
- Controlled blasting with proper spacing, burden, stemming and optimum charge/delay will be maintained;
- The blasting will be carried out during favourable atmospheric condition and less human activity timings by using nonelectrical initiation system;
- Proper maintenance, oiling and greasing of machines will be done every week to reduce generation of noise;
- Provision of sound insulated chambers for the workers working on machines (HEMM) producing higher levels of noise;
- Silencers / mufflers will be installed in all machineries;
- Green Belt/Plantation will be developed around the project area and along the haul roads. The plantation minimizes propagation of noise;
- Personal Protective Equipment (PPE) like ear muffs/ear plugs will be provided to the operators of HEMM and persons working near HEMM and their use will be ensured though training and awareness.
- Regular medical check–up and proper training to personnel to create awareness about adverse noise level effects.

4.5 BIOLOGICAL ENVIRONMENT

ANTICIPATED IMPACT

There are no National Park and Archaeological monuments within project area. There are no migratory corridors, migratory avian-fauna, rare endemic and endangered species. There are no wild animals in the area. No breeding and nesting site were identified in project site. No National park and Wildlife Sanctuary found within 10km radius. The dumps / bunds around the mine itself act as a good barrier for entry of stray animals. In the post mining stage, barbed wire fencing is proposed all around the mined-out void to prevent fall of animals in the mine pits.

MITIGATION MEASURES

To reduce the adverse effects on natural flora/fauna status of the area due to deposition of dust generated from mining operations, water sprinkling and water spraying systems will be ensured in all dust prone areas to arrest dust generation. Methodical and well-planned plantation scheme will be carried out.

4.5.1 GREENBELT DEVELOPMENT PLAN

PROPOSAL – P1					
Year	No. of trees proposed to be planted	Survival %	Area to be covered sq.m	Name of the species	No. of trees expected to be grown
I	45	80%	400	Neem, Pongamia Pinnata, Casuarina etc.,	36
II	45	80%	400		36
III	45	80%	400		36
IV	45	80%	400		36
V	45	80%	400		36
PROPOSAL – P2					
Year	No. of trees proposed to be planted	Survival %	Area to be covered sq.m	Name of the species	No. of trees expected to be grown
I	45	80%	400	Neem, Pongamia Pinnata, Casuarina etc.,	36
II	45	80%	400		36
III	45	80%	400		36
IV	45	80%	400		36
V	45	80%	400		36
PROPOSAL – P3					
Year	No. of trees proposed to be planted	Survival %	Area to be covered sq.m	Name of the species	No. of trees expected to be grown
I	45	80%	400	Neem, Pongamia Pinnata, Casuarina etc.,	36
II	45	80%	400		36
III	45	80%	400		36
IV	45	80%	400		36
V	45	80%	400		36
PROPOSAL – P4					
Year	No. of trees proposed to be planted	Survival %	Area to be covered sq.m	Name of the species	No. of trees expected to be grown
I	35	80%	340	Neem, Pongamia Pinnata, Casuarina etc.,	28
II	35	80%	340		28
III	35	80%	340		28
IV	35	80%	340		28
V	35	80%	340		28

4.6 SOCIO ECONOMIC ENVIRONMENT

ANTICIPATED IMPACT

Employment generation due to the project will provide direct employment for about 88 persons.

MITIGATION MEASURES

- Good maintenance practices will be adopted for plant machinery and equipment, which will help to avert potential noise problems.
- Green belt will be developed in and around the project site as per Central Pollution Control Board (CPCB) guidelines.
- Appropriate air pollution control measure will be taken to minimize the environmental impact within the core zone.
- For the safety of workers, personal protective appliances like hand gloves, helmets, safety shoes, goggles, aprons, nose masks and ear protecting devices will be provided as per mines act and rules.
- Benefit to the State and the Central governments through financial revenues by way of royalty, tax, DMF, NMET etc, from this project directly and indirectly.

5. **ANALYSIS OF ALTERNATIVES (TECHNOLOGY AND SITE)**

The site has been selected based on geological investigation and exploration as below:

- Occurrence of minerals at the specific site.
- Transportation facility for materials & manpower.
- Overall impact on environment and mitigation feasibility
- Socio – economic background.

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

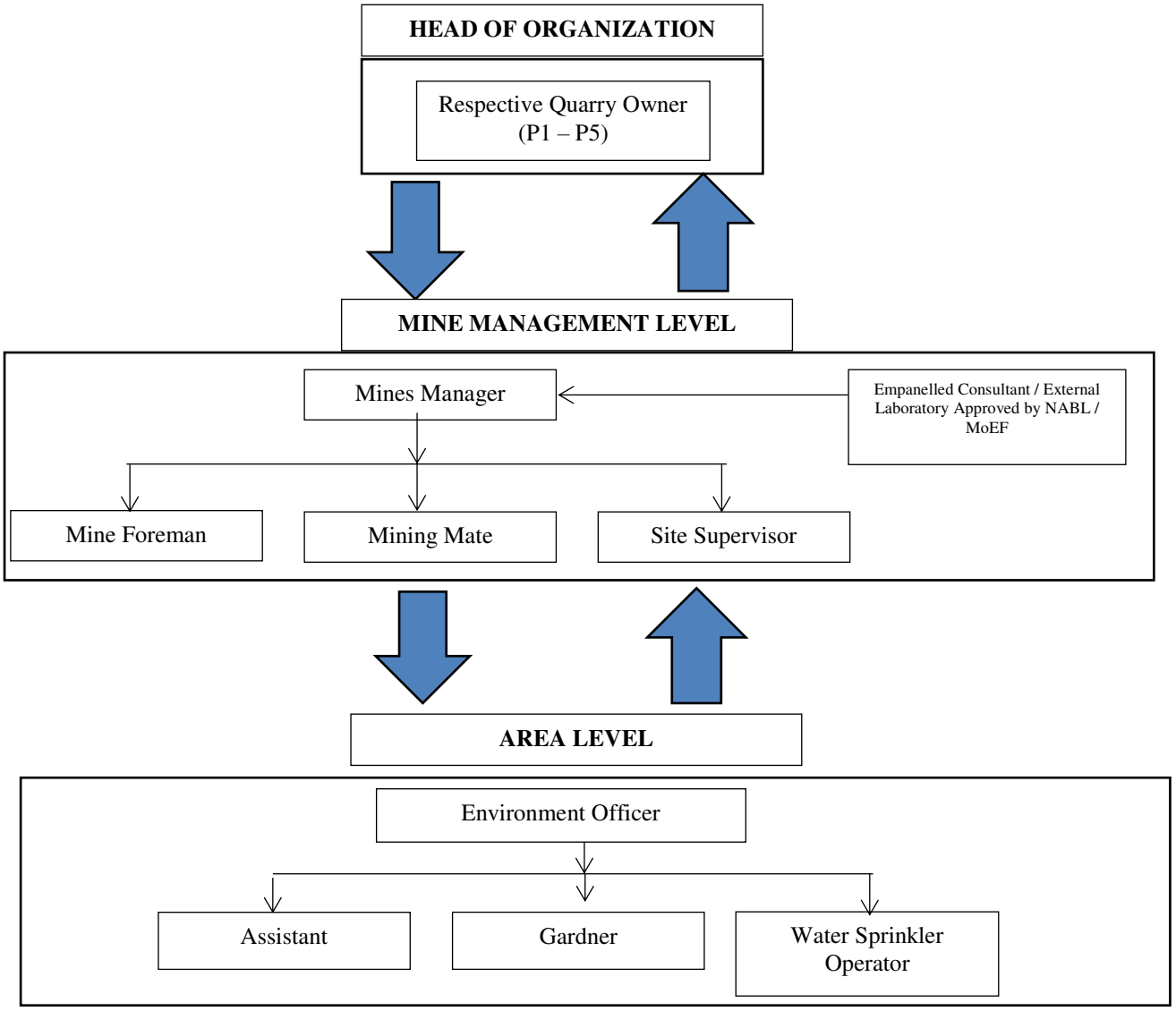
6. **ENVIRONMENT MONITORING PROGRAM**

Usually an impact assessment study is carried over short period of time and the data cannot bring out all variations induced by natural or human activities. Hence regular monitoring program of Environmental parameters is essential to take into account the changes in the Environment.

The Objective of Monitoring -

- To check or assess the efficiency of the controlling measures;
- To establish a data base for future impact assessment studies.

6.1 ENVIRONMENTAL MONITORING CELL



6.2 POST ENVIRONMENTAL CLEARANCE MONITORING SCHEDULE

IN COMMON FOR P1 – P5					
S. No.	Environment Attributes	Location	Monitoring		Parameters
			Duration	Frequency	
1	Air Quality	2 Locations (1 Core & 1 Buffer)	24 hours	Once in 6 months	Fugitive Dust, $PM_{2.5}$, PM_{10}, SO_2 and NO_x.
2	Meteorology	At mine site before start of Air Quality Monitoring & IMD Secondary Data	Hourly / Daily	Continuous online monitoring	Wind speed, Wind direction, Temperature, Relative humidity and Rainfall
3	Water Quality Monitoring	2 Locations (1SW & 1 GW)	-	Once in 6 months	Parameters specified under IS:10500, 1993 & CPCB Norms
4	Hydrology	Water level in open wells in buffer zone around 1 km at specific wells	-	Once in 6 months	Depth in bgl
5	Noise	2 Locations (1 Core & 1 Buffer)	Hourly – 1 Day	Once in 6 months	Leq, Lmax, Lmin, Leq Day & Leq Night
6	Vibration	At the nearest habitation (in case of reporting)	–	During blasting Operation	Peak Particle Velocity
7	Soil	2 Locations (1 Core & 1 Buffer)	–	Once in six months	Physical and Chemical Characteristics
8	Greenbelt	Within the Project Area	Daily	Monthly	Maintenance

7. ADDITIONAL STUDIES

7.1 RISK ASSESSMENT FOR P1 – P5

The methodology for the risk assessment has been based on the specific risk assessment guidance issued by the Directorate General of Mine Safety (DGMS), Dhanbad, vide Circular No.13 of 2002, dated 31st December, 2002. The DGMS risk assessment process is intended to identify existing and probable hazards in the work environment and all operations and assess the risk levels of those hazards in order to prioritize those that need immediate attention. Further, mechanisms responsible for these hazards are identified and their control measures, set to timetable are recorded along with pinpointed responsibilities.

The whole quarry operation will be carried out under the direction of a Qualified Competent Mine Manager holding certificate of competency to manage a metalliferous mine granted by the DGMS, Dhanbad. Risk Assessment is all about prevention of accidents and to take necessary steps to prevent it from happening.

7.2 DISASTER MANAGEMENT PLAN FOR P1 – P5

The Disaster Management Plan is aimed to ensure safety of life, protection of environment, protection of installation, restoration of production and salvage operations in this same order of priorities.

The objective of the Disaster Management Plan is to make use of the combined resources of the mine and the outside services to achieve the following:

- Rescue and medical treatment of casualties;
- Safeguard other people;
- Minimize damage to property and the environment;
- Initially contain and ultimately bring the incident under control;
- Secure the safe rehabilitation of affected area; and
- Preserve relevant records and equipment for the subsequent inquiry into the cause and circumstances of the emergency.

7.3 CUMULATIVE IMPACT STUDY

CUMULATIVE PRODUCTION LOAD OF ROUGH STONE

Quarry	Production for five year plan period	Per Year Production in m^3	Per Day Production in m^3	Number of Lorry Load Per Day
P1	2,76,500	55,300	184	31
P2	81,738	16,348	54	9
P3	1,21,194	24,239	81	14
P4	81,705	16,341	54	9
Total	**5,61,137**	**1,12,228**	**373**	**63**
E1	24,575	4,915	16	3
E2	1,99,440	39,888	134	22
E3	2,88,900	57,780	193	32
E4	78,942	15,788	53	17
E5	1,02,120	20,424	68	11
E6	47,390	9,478	32	5
E7	22,010	4,402	15	3
E 8	34,130	6,826	23	4
E9	1,06,085	21,217	71	12
E10	77,355	15,471	52	9
E11	71,075	14,215	47	8
Total	**1,052,022**	**210,404**	**704**	**126**
Grand Total	**1,613,159**	**322,632**	**1,077**	**189**

CUMULATIVE PRODUCTION LOAD OF GRAVEL

Quarry	Production for five year plan period	Per Year Production in m^3	Per Day Production in m^3	Number of Lorry Load Per Day
P1	38,236	12,745	42	7
P2	11,496	3,832	13	2
P3	7,038	7,038	23	4
P4	4,950	1,650	6	1
Total	**61,720**	**25,265**	**84**	**14**
E1	32	-	-	-
E2	-	-	-	-
E3	1,200	1,200	4	1
E4	4,212	2,106	7	1
E5	132	132	1	1
E6	6,360	3,180	11	2
E7	10,064	2,013	7	1
E8	1,104	1,104	4	1
E9	19,060	9,530	32	5
E10	7,068	7,068	24	4
E11	-	-	-	-
Total	**49,232**	**26,333**	**90**	**16**
Grand Total	**1,10,952**	**51,598**	**174**	**30**

PREDICTED NOISE INCREMENTAL VALUES IN 500 M RADIUS QUARRIES

Location ID	Background Value (Day) dB(A)	Incremental Value dB(A)	Total Predicted dB(A)	Residential Area Standards dB(A)
Habitation Near P1	41.4	45.8	47.1	55
Habitation Near P2	47	45.3	49.2	
Habitation Near P3	42	40.1	44.2	
Habitation Near P4	48.3	42.0	49.2	
Habitation Near P5	46.1	48.1	50.2	
Habitation Near E1	38.86	47.6	48.2	
Habitation Near E2	39.16	46.7	47.4	
Habitation Near E3	42.44	41.5	45.0	
Habitation Near E4	46.92	46.1	49.5	
Habitation Near E5	42.2	48.5	49.4	
Habitation Near E6	43.85	44.5	47.2	
Habitation Near E7	39.26	43.2	44.7	
Habitation Near E8	40.3	41.5	44.0	
Habitation Near E9	37.84	40.1	42.1	
Habitation Near E10	41.01	42.6	44.9	
Habitation Near E11	36.3	49.2	49.4	

Source: Lab Monitoring Data

ANTICIPATED GROUND VIBRATIONS IN CLUSTER

Location ID	Distance & Direction
Habitation Near P1	520m SW
Habitation Near P2	550m SE
Habitation Near P3	1Km East
Habitation Near P4	800m SW
Habitation Near E1	470m SW
Habitation Near E2	420m SW
Habitation Near E3	750m NW
Habitation Near E4	380m West
Habitation Near E5	350m south
Habitation Near E6	850m NW
Habitation Near E7	850m SE
Habitation Near E8	500m SW
Habitation Near E9	1km NE
Habitation Near E10	600m West
Habitation Near E11	700m SW

SOCIO ECONOMIC BENEFITS FROM CLUSTER

	Project Cost	CER @ 2%
P1	Rs.51,50,390	Rs.1,03,008
P2	Rs. 27,07,850	Rs.54,157
P3	Rs. 29,13,070	Rs.58,261
P4	Rs.24,86,355	Rs.49,727
Total	**Rs.1,32,57,665**	**Rs.2,65,153**
E1	Rs.38,04,000	Rs.76,080
E2	Rs.63,38,000	Rs.1,26,760
E3	Rs.65,66,000	Rs. 1,31,320
E4	Rs.31,56,000	Rs. 63,120
E5	Rs.61,55,000	Rs.1,23,100
E6	Rs. 34,98,000	Rs. 69,960
E7	Rs.31,51,000	Rs.63,020
E8	Rs.31,50,000	Rs.63,000
E9	Rs. 29,58,000	Rs. 59,160
E10	Rs.36,28,550	Rs.73,000
E11	Rs.32,64,085	Rs. 67,000
Total	**Rs. 4,56,68,635**	**Rs. 9,15,520**
Grand Total	**Rs. 5,89,26,300**	**Rs. 11,80,673**

EMPLOYMENT BENEFITS

Description	Employment
P1	27
P2	18
P3	21
P4	22
Total	**88**
E1	14
E2	9
E3	14
E4	11
E5	14
E6	18
E7	18
E8	12
E9	14
E10	21
E11	10
Total	**155**
Grand Total	**243**

GREENBELT DEVELOPMENT BENEFITS FROM CLUSTER

CODE	No of Trees proposed to be planted	Survival %	Area Covered Sq.m	Name of the Species	No. of Trees expected to be grown
P1	225	80%	2000	Neem, Casuarina	180
P2	225	80%	2000	Neem, Casuarina	180
P3	225	80%	2000	Neem, Casuarina	180
P4	175	80%	1700	Neem, Casuarina	140
Total	**850**	**80%**	**7,700**	**Neem, Casuarina**	**680**
E1	100	80%	1000	Neem, Casuarina	80
E2	100	80%	1000	Neem, Casuarina	80
E3	150	80%	1000	Neem, Casuarina	120
E4	150	80%	1500	Neem, Casuarina	120
E5	100	80%	1000	Neem, Casuarina	80
E6	400	80%	2000	Neem, Casuarina	320
E7	400	80%	2000	Neem, Casuarina	320
E8	100	80%	1000	Neem, Casuarina	80
E9	200	80%	1000	Neem, Casuarina	160
E10	100	80%	750	Neem, Casuarina	90
E11	150	80%	2500	Neem, Casuarina	120
Total	**1950**	**80%**	**14,750**	**Neem, Casuarina**	**1,570**

8. PROJECT BENEFITS

Four Proposed Projects for Quarrying Rough Stone at Chikkirampalayam Village aims to produce cumulatively 5,61,137 m^3 Rough Stone & 61,720 $m^3$of Gravel over a period of 5 Years. This will enhance the socio-economic activities in the adjoining areas and will result in the following benefits

- Increase in Employment Potential
- Improvement in Socio-Economic Welfare
- Improvement in Physical Infrastructure
- Improvement in Social infrastructure

9. ENVIRONMENT MANAGEMENT PLAN FOR P1 – P5

The Environment Monitoring Cell formed by the mine management will ensure effective implementation of environment management plan and to ensure compliance of environmental statutory guidelines through Mine Management Level.

The said team will be responsible for:

- Monitoring of the water/ waste water quality, air quality and solid waste generated
- Analysis of the water and air samples collected through external laboratory
- Implementation and monitoring of the pollution control and protective measures/ devices which shall include financial estimation, ordering, installation of air pollution control equipment, waste water treatment plant, etc.
- Co-ordination of the environment related activities within the project as well as with outside agencies
- Collection of health statistics of the workers and population of the surrounding villages
- Green belt development
- Monitoring the progress of implementation of the environmental monitoring programme
- Compliance to statutory provisions, norms of State Pollution Control Board, Ministry of Environment and Forests and the conditions of the environmental clearance as well as the consents to establish and consents to operate.

10. CONCLUSION

It can be concluded from overall assessment of the impacts, in terms of positive and negative effects on various environmental components, that the mining activities will not have any adverse effect on the surrounding environment.

To mitigate any impacts due to the mining activities, a well-planned EMP and a detailed post project monitoring system is provided for regular monitoring and immediate rectification at site. Due to the cluster quarrying activities, socio economic conditions in and around the project site will be improved substantially. Hence, the Prior Environmental Clearance shall be granted at the earliest.