

SUMMARY
OF
DRAFT EIA/EMP REPORT
FOR
**ROUGH STONE AND
GRAVEL QUARRY**

Extent	2.30.2 Ha
Land Type	Consent Registered Patta Land
5 yrs Production	Rough stone – 2,41,368 m ³ Gravel – 74,690.55 m ³ Top Soil – 15,178 m ³
Depth	36m bgl

**VILLAGE – APPAINAICKENPATTI, TALUK – VEMBAKOTTAI TALUK,
DISTRICT – VIRUDHUNAGAR, STATE – TAMILNADU.**

PROJECT PROPONENT

TMT. R. GAYATHIRI

No. 44, Kalugumalai Road, Thiruvengadam Town & Taluk,
Tenkasi District- 627719.

CONSULTANT

CREATIVE ENGINEERS & CONSULTANTS



Creating Possibilities

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DRAFT EIA/EMP REPORT FOR ROUGHSTONE AND GRAVEL QUARRY OF TMT R. GAYATHIRI AT S.F.NO. 39/1A, 39/1B, 39/2A, 49 OVER AN AREA OF 2.302 HA IN APPANAYAKKANPATTI VILLAGE, VEMBAKOTTAI TALUK, VIRUDHUNAGAR DISTRICT, TAMIL NADU

SUMMARY

1.1 INTRODUCTION:

Tmt. R.Gayathiri proposes to operate a **Rough Stone and Gravel Quarry** at Survey No. 39/1A,39/1B, 39/2A, 49 over an extent 2.30.2 Ha in Appainackanpatti Village, Vembakottai Taluk, Virudhunagar District, Tamilnadu., for the production capacity of 2,41,368 m³ of Rough Stone and 74,690.5 m³ of Gravel and 15,178m³ of top soil for the period of five years upto a depth of 36m bgl and has initiated action towards obtaining environmental clearance.

Although the individual lease area of this project is less than 5 Ha, the other existing quarries within the 500m radius cluster along with this subject project works out to >5 Ha. Hence, this proposal is considered under Category – B1 and as per MoEF & CC notification necessitates preparation of EIA/EMP report and public hearing. In this cluster, apart from Tmt.R.Gayathiri, Thiru S.Ramraj, Thiru S.Ragupathi, and Thiru G. Kaniraj have also proposed for new mine leases and applied for Environmental clearance. As such Common EIA for the 4 proposed projects falling in the cluster along with separate assessment of impacts and EMP for each project is carried out.

1.2 STATUTORY APPROVALS:

Table 1:Statutory Approvals

1.	Precise Area Communication Letter	KV1/572/2019 Dated: 18.12.2020
2.	Mining Plan Approval	KV1/572/2019, dated 18.08.2021
3.	Terms of Reference	SEIAA-TN/F.No.8955/SEAC/ToR 1130/2022 dated 25.03.2022

Based on the conditions of Precise Area Communication letter, a safety distance of 50m is provided for the drainage channel passing in the southern side and 7.5m safety distance has been left for the adjoining patta lands. As per TOR Condition, the draft EIA/EMP report for the Rough Stone and Gravel Quarry of Tmt.R.Gayathiri is prepared. Part of the lease area is already mined in the earlier lease period. Salient details of the report is given below.

DRAFT EIA/EMP REPORT FOR ROUGHSTONE AND GRAVEL QUARRY OF TMT R. GAYATHIRI AT S.F.NO. 39/1A, 39/1B, 39/2A, 49 OVER AN AREA OF 2.302 HA IN APPANAYAKKANPATTI VILLAGE, VEMBAKOTTAI TALUK, VIRUDHUNAGAR DISTRICT, TAMIL NADU

2.1 SITE DESCRIPTION:

Table 2: Site Details

S.No	Particulars	Details
1.	Name of the Project	Rough Stone and Gravel Quarry of Tmt. R.Gayathiri
2.	Location of the project	Appainaickenpatti Village, Vembakottai Taluk, Virudhunagar District, Tamilnadu
3.	Survey No.	39/1A,39/1B, 39/2A, 49
4.	Proposed production for 5 years lease period	Roughstone – 2,41,368m ³ Gravel – 74,690 m ³ Topsoil - 15,178m ³
5.	Latitude & Longitude	Latitude: 9°17'40.4"N to 9°17'48.8"N Longitude: 77°41'49.4"E to 77°41'56.1"E
6.	Mining Lease area	2.302 Ha
7.	Type of land	Private Patta land
8.	Mine site topography	Gentle plain terrain. Part of the lease area has already been mined out. topography of the lease area - Around 97m RL.
9.	Accessibility	The lease area can be approached from Alamelumangaipuram – Thiruvengadam which leads to SH-44.
10.	Nearest Highway	SH-44 – 4.0 km (S)
11.	Nearest major Railway station	Kovilpatti Railway Station – 25 Km
12.	Nearest Airport	Thoothukudi – 85Km
13.	Nearest major water bodies	Drainage -50m safety-S Nadi - 310m (W), Vaippar River-350m- (N), Uppu Odai - 2.8km-(SE), Marugal Odai – 4.9km – (NE), Kayalkudi River - 7.0km – (NE).
14.	Environmental sensitive areas, Protected areas as per Wildlife Protection Act, 1972 (Tiger reserve, Elephant reserve, Biospheres, National parks, Wildlife sanctuaries, community reserves and conservation reserves)	Nil within 10 Km radius
15.	Local Places of Historical and Tourism Interest	Nil within 10 Km radius
16.	Reserved / Protected Forests	Nil within 10 Km radius
17.	Seismic Zone	Zone – II (Least Active)

DRAFT EIA/EMP REPORT FOR ROUGHSTONE AND GRAVEL QUARRY OF TMT R. GAYATHIRI AT S.F.NO. 39/1A, 39/1B, 39/2A, 49 OVER AN AREA OF 2.302 HA IN APPANAYAKKANPATTI VILLAGE, VEMBAKOTTAI TALUK, VIRUDHUNAGAR DISTRICT, TAMIL NADU

Table 3: Technical Description

A) Past Production:

Quarrying in this lease area was earlier carried out by K. Krishnamoorthy for the period of 08.10.2013 to 07.10.2018 with the proceeding no. KV1/1315/2012 dated 07.10.2013 & Environmental clearance for the earlier lease area obtained from SEIAA – TN vide letter no Lr.No. SEIAA-TN/F.No.1017/EC/1(a)/531/2013 dated 01.07.2013 for Rough stone blue metal & Gravel quarrying at SF no 39/1B, 39/2A, Appainaickanpatti village, Vembakottai taluk, Virudhunagar District, Tamil Nadu over 1.10.0 Ha of the lease area.

B) Present proposal:

S.No	Particulars	Details			
1.	Geological reserve	Roughstone – 10,56,608 cum , Gravel- 1,46,568cum, Topsoil – 28,752cum			
2.	Mineable reserve	Roughstone – 2,41,368 cum , Gravel - 74,690.5cum, Topsoil – 15,178 cum			
3.	Method of Mining	Open cast mechanized mining method with drilling, blasting, excavation, loading and transportation of Roughstone to needy buyers.			
4.	Production	YEAR	ROUGHSTONE (m3)	GRAVEL (m3)	TOPSOIL (m3)
		I	41143	20332.5	4312
		II	30450	28683.0	5506
		III	58650	--	5360
		IV	56350	13825.0	--
		V	54775	11850.0	--
		Total	2,41,368	74,690.5	15,178
5.	Lease Period	5 Years			
6.	Waste Generation and Management	Since the entire material will be used there will be no waste generation			
7.	Ultimate Mine depth	36m			
8.	Manpower	Direct – 18, Indirect – 50			
9.	Water Requirement & source	Total water – 10 KLD Will be procured from outside agencies initially. Later, water collected in the mine pit will be used to meet the needs.			
10.	Power Requirement	All the equipment will be diesel operated. No electricity is needed for mining operation. The minimum power requirement for office, etc will be met from			

DRAFT EIA/EMP REPORT FOR ROUGHSTONE AND GRAVEL QUARRY OF TMT R. GAYATHIRI AT S.F.NO. 39/1A, 39/1B, 39/2A, 49 OVER AN AREA OF 2.302 HA IN APPANAYAKKANPATTI VILLAGE, VEMBAKOTTAI TALUK, VIRUDHUNAGAR DISTRICT, TAMIL NADU

S.No	Particulars	Details
		state grid.
11.	Site services	Mine office, first aid room, rest shelters, toilets etc. will be provided as semi-permanent structures.
12.	Project cost	Rs. 2,85,58,980/-
13.	CER cost	Rs.6.0 Lakhs

3.1 EXISTING ENVIRONMENTAL SCENARIO:

The studies and data collection have been carried out systematically and meticulously as per relevant IS codes, CPCB and MoEF&CC guidelines and as per approved ToR during **Winter Season (December 2021 to February 2022)** For the purpose of this study, the area has been divided into two zones, namely, core and buffer zones. Core zone is considered as the total lease area of the cluster, while buffer zone encompasses an area of 10 km radius distance from the periphery of core zone. Based on 2011 census data, in the 10km radius there are 35 Rural villages & 2 urban areas namely Alangulam (CT) , Thiruvenkadam (TP) from six taluks namely Sivakasi, Rajapalayam, Sattur of Virudhunagar District, Sankarankoil of Tirunelveli District and Kovilpatti of Thoothukkudi District.

Table 4: Social, Economic & Demographic Profile of The Study Area

Details	Population	Percentage
A. Gender-wise distribution		
Male Population	49528	49.35
Female Population	50838	50.65
Total	100366	100
B. Caste-wise population distribution		
Scheduled Caste	23360	23.27
Scheduled Tribes	149	0.15
Other	76857	76.58
Total	100366	100
C. Literacy Levels		
Total Literate Population	69612	69.36
Others	30754	30.64
Total	100366	100
D. Occupational structure		
Main workers	49466	49.30
Marginal workers	5157	5.10
Total Workers	54623	54.40
Total Non-workers	45743	45.60
Total	100366	100

DRAFT EIA/EMP REPORT FOR ROUGHSTONE AND GRAVEL QUARRY OF TMT R. GAYATHIRI AT S.F.NO. 39/1A, 39/1B, 39/2A, 49 OVER AN AREA OF 2.302 HA IN APPANAYAKKANPATTI VILLAGE, VEMBAKOTTAI TALUK, VIRUDHUNAGAR DISTRICT, TAMIL NADU

3.2.1 EXISTING ENVIRONMENTAL QUALITY:

Baseline monitoring was carried out during Winter Season, December 2021 to February 2022).

The details of the same are provided below:

Table 5: Baseline Data

A) AMBIENT AIR QUALITY		Monitoring Location – 6 locations	
PARAMETER	RESULT ($\mu\text{g}/\text{m}^3$)		*LIMIT ($\mu\text{g}/\text{m}^3$)
Location	Core Zone	Buffer Zone	
Particulate Matter (Size <10 μm)	59.6 – 76.3	41.4 – 70.2	100
Particulate Matter (Size <2.5 μm)	28.2 – 36.6	19.3 – 32.6	60
Sulphur Dioxide (as SO_2)	5.3– 9.1	4.1 – 7.5	80
Nitrogen Dioxide (as NO_2)	8.5 – 12.7	7.1 – 12.3	80
Conclusion: The existing Ambient Air Quality levels for PM10, PM2.5, SO_2 and NO_2 , are within the NAAQ standards prescribed CPCB limits of 100 $\mu\text{g}/\text{m}^3$, 60 $\mu\text{g}/\text{m}^3$, 80 $\mu\text{g}/\text{m}^3$ & 80 $\mu\text{g}/\text{m}^3$. The CO values in all the locations were found to be below detectable limit.			
B) WATER QUALITY		Monitoring Location – 6 locations	
PARAMETER	Result	*LIMIT ($\mu\text{g}/\text{m}^3$)	
pH at 25 °C	7.29 – 7.69	6.5-8.5	
Total Dissolved Solids, mg/L	296 – 590	2000	
Chloride as Cl^- , mg/L	38.50 – 162	1000	
Total Hardness (as CaCO_3), mg/L	190 – 395	600	
Total Alkalinity (as CaCO_3), mg/L	277– 310	600	
Sulphates as SO_4^{2-} , mg/L	15.20 – 186	400	
Iron as Fe, mg/L	BDL – 0.07	0.3	
Nitrate as NO_3 , mg/L	BDL – 5.45	45	
Fluoride as F, mg/L	BDL – 0.53	1.5	
Conclusion: The water quality of ground water is found to be within the prescribed Permissible limits of IS: 10500 Norms in the absence of an alternative source as per Drinking Water Specifications.			
C) NOISE LEVELS		Monitoring Location – 6 locations	
PARAMETER	RESULT dB(A)		*LIMIT ($\mu\text{g}/\text{m}^3$)
	Day Equivalent	Night Equivalent	
Core Zone	49.7	38.8	90
Buffer Zone	44.8 – 48.2	36.7 – 42.9	Day Equivalent - 55dB(A), Night Equivalent - 45dB(A)
*Permissible noise for industrial workers as laid down by CPCB (at 8 hrs Exposure Time). While comparing with the MoEF&CC Norms, the monitored ambient noise levels are generally within the limit values.			
D) SOIL QUALITY		Monitoring Location – 3 locations	
PARAMETER	Range of values		
pH	6.21 – 7.57		
Electrical Conductivity ($\mu\text{mho}/\text{cm}$)	82.29 – 98.54		
Organic matter (%)	2.45 – 3.21		
Total Nitrogen (mg/kg)	589 – 1020		
Phosphorus (mg/kg)	2.14– 3.65		

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Sodium (mg/kg)	765 - 1035
Potassium (mg/kg)	610 – 776
Soil is of clay loam and sandy clay loam type.	

3.2.2 LAND ENVIRONMENT:

Land use pattern study carried out through remote sensing satellite data around the 10km buffer zone shows that 14.56 % of the study area is agriculture land and 30.25 % are fallow land. Land with scrub constitutes 41.61 %, lands without scrub constitute 7.58% and waterbodies constitute 2.93% and remaining constitute 3.07 %.

3.2.3 BIOLOGICAL ENVIRONMENT:

Flora: The lease area is a non-forest, private land. Major part of lease area is partly minedout area and remaining area is barren land with thorny bushes & shrubs (*Prosopis juliflora*). The buffer zone is dominated by species like *Prosopis juliflora*, *Azadirachta indica*, *Borassus flabellifer*, *Acacia nilotica*, *Albizia lebeck*, *Acacia leucophloea*, *Acacia auriculiformis*, etc.

Fauna: There is no Wild Life Sanctuary or National Park within the study area of 10 km. Domesticated animals are commonly found. There is no Schedule I species in the core & buffer zone.

3.2.4 HYDROLOGICAL STUDY:

A Hydro Geological study for the Roughstone and Gravel Quarry was carried out by Dr.S. Selvam, V.O.Chidambaram College. Based on the available information and the geophysical investigations the study concluded that the project area is considered to have poor groundwater potential. Productive aquifers are expected beyond depth of 60m BGL. Besides, the mining area consists of hard compact rock, no major water seepage within the mine is expected. There is no water seepage noticed in to the already quarried pits situated nearby the proposed quarry area. Hence, the quarrying up to the proposed depth may not have any adverse impact in the area over ground water conditions.

4.1 ANTICIPATED ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

This is a proposed project and Semi – Mechanized Open Cast mining will be carried out to quarry out Rough Stone, & Gravel. The identified impacts due to this mine during mining and

DRAFT EIA/EMP REPORT FOR ROUGHSTONE AND GRAVEL QUARRY OF TMT R. GAYATHIRI AT S.F.NO. 39/1A, 39/1B, 39/2A, 49 OVER AN AREA OF 2.302 HA IN APPANAYAKKANPATTI VILLAGE, VEMBAKOTTAI TALUK, VIRUDHUNAGAR DISTRICT, TAMIL NADU

associated activities have been studied in relation to various environmental components like Air, water, noise, vibration, land, transport etc.

4.1.1 AIR ENVIRONMENT:

The principal sources of air pollution in general due to mining and allied activities will be Excavation, Drilling, Movement of HEMM such as Excavators, tippers etc., Loading and unloading operation and transportation. In case of this mine, the following measures will be adopted to control impact on the air quality due to mining operations in the lease area:

- Regular wetting of transport road using mobile water tanker. Proponent has already installed fixed water sprinkler in the road connecting the mine and the nearby crusher..
- Wet drilling / Covering of drill holes with wet clothes
- Proper maintenance of roads.
- Avoiding overloading of tippers & Transportation of material by tarpaulin covered trucks
- Proper maintenance of HEMM to minimize gaseous emission
- Setting up of tyre washing facility in the lease area exit.
- Vehicular emission tests with digital smoke meter.
- Provision of tin sheet/ green netting around the lease periphery on all sides.
- Development of green belt/ plantation in various areas within the mine lease area etc.

By adoption of all these measures, no adverse impact on air quality is envisaged due to this proposed opencast mining operation.

The impact on air quality due to the proposed project is estimated using AERMOD View Gaussian Plume Air Dispersion Model.

The impact on air quality due to the proposed project estimated using computer dispersion model (AERMOD) show that the resultant added concentrations with baseline figures even at worst scenario, the values of ambient air quality with respect to PM₁₀ are in the range of 55.1 g/m³ to 79.5 g/m³ and with respect to PM_{2.5} are in the range of 25.9 µg/m³ to 38.0 µg/m³ which are within the statutory limits in each case.

DRAFT EIA/EMP REPORT FOR ROUGHSTONE AND GRAVEL QUARRY OF TMT R. GAYATHIRI AT S.F.NO. 39/1A, 39/1B, 39/2A, 49 OVER AN AREA OF 2.302 HA IN APPANAYAKKANPATTI VILLAGE, VEMBAKOTTAI TALUK, VIRUDHUNAGAR DISTRICT, TAMIL NADU

For preservation of environment in this mine strict enforcement of management schemes will be undertaken for taking corrective actions, as needed. By adopting the effective implementation of all the mitigative measures, no adverse impact on Air quality due to the mining operation in this lease area is expected.

4.1.2 WATER ENVIRONMENT:

The total water requirement for this project will be 10.0 KLD. The water will be sourced initially from outside agencies. Later the rainwater collected in the mine pit sump will be used for this purpose.

The domestic effluent to be generated from the project will be collected in septic tank with soak pits arrangements. This being a mining project there will not be any process effluent. Since the entire material from the quarry face will be directly dispatched to the consumers, there will not be any stockpiles. There are no waste dumps in this quarry. As such there will not be any wash out due to stock pile or waste dumps.

The rain water falling in the quarry will be harvested in the sump at the lowest level of the quarry. This sump will act as a settling pond to prevent solids escaping along with discharge, before outlet. etc. Towards surface runoff management, garland drain will be constructed around the quarry and will be connected to a settling pond with silt traps. The supernatant clear water from the settling pond will be flow to the downstream users.

There is a drainage channel passing on the southern side of the lease area for which 50m safety zone has been left. Earthen bund formation and erection of tin sheet in this side within the lease will be done. Besides, good plantation will also be carried out in the safety zone. There is no proposal to discharge any effluent into this water body. Non- perennial Vaippar river and its tributary Nadhi is located 350 meter (North) and 310 m (west) respectively from the lease area. Based on geophysical study there is no observation of fractured zone/ fissure vein up to depth of 60m in the study area. During the rainy time only surface water flow in vaippar river is observed and in the remaining period it is almost dry. As such no major impact is envisaged on the ground water and surface water regime.

4.1.3 NOISE ENVIRONMENT:

During mining operation there will be noise generation due to working of excavators, movement of vehicles, etc. However, it will be felt near the active working area only and at away from its

DRAFT EIA/EMP REPORT FOR ROUGHSTONE AND GRAVEL QUARRY OF TMT R. GAYATHIRI AT S.F.NO. 39/1A, 39/1B, 39/2A, 49 OVER AN AREA OF 2.302 HA IN APPANAYAKKANPATTI VILLAGE, VEMBAKOTTAI TALUK, VIRUDHUNAGAR DISTRICT, TAMIL NADU

source it will get reduced. There will also be attenuation due to vegetation, tin sheet/ green netting to be erected by the proponent all around the lease and as such there will not be any adverse noise propagation outside the lease boundary. Due to natural attenuation effects, by proper green belt development, design / maintenance of machines, etc., the impact on noise levels will be negligible and are expected to be well within the prescribed limits.

4.1.4 VIBRATION:

Scientific Study on Blast Induced Ground Vibration and Design of Controlled Blasting Parameters' for this project was conducted by **Department of Mining Engineering, Anna University, Chennai**. From the study it was deduced that blasting can certainly be carried out in the cluster rough stone and gravel quarries comprising all the existing and proposed quarries.

To reduce ground vibratory conditions, as suggested in the report various control measures will be implemented such as controlled blasting using NONEL, optimum design for burden and spacing, reducing explosive charge per delay to minimum, not carrying out blasting during strong winds, choosing mine working face in the North-West direction away from the building structures to avoid the propagation of ground vibration from the blasting site, etc. By adoption of above measures, it will be ensured that ground vibrational levels due to blasting will be maintained within the prescribed DGMS conditions of 10 mm/s for the domestic houses/structures. SOP for blasting will be followed to ensure no adverse impact due to blasting vibration on the nearby region.

It is also concluded in the study that the controlled blasting using NONEL by limiting maximum explosive charge per delay, did not produce peak particle velocities (blast vibrations) greater than 2 mm/s at the locations of the interest, namely, College building and structures implying that they are safe.

4.1.5 IMPACT ON LAND ENVIRONMENT:

In the post mining stage, entire 2.08 Ha of mined out area will be left as water body, 0.03 Ha will be the mine roads & infrastructure, 0.112 Ha will be covered with vegetation and 0.08 will be fencing. Entire mined out area will be properly fenced to prevent inadvertent entry of men and animals. In the post mining stage the rainwater harvested in the mined out void shall be utilized.

4.1.6 BIOLOGICAL ENVIRONMENT:

Major part of the lease area is already mined. Other than clearing the shrubs and bushes within the lease area, no clearance of major vegetation is involved. Necessary mitigative measures like dust suppression, proper maintenance of equipment's, greenbelt and plantation etc., will be carried out to prevent dust generation & any further impact on the vegetation or agricultural activity nearby. Greenbelt / Plantation will be carried out to enhance the vegetative growth and aesthetic in the safety zone area

4.1.7 SOCIO ECONOMIC ENVIRONMENT:

The entire lease area is private patta land. There are no habitations or hutments in the core zone area and no rehabilitation or resettlement problems will arise here.

The mining operations in the proposed mine will provide the following socio-economic benefits:

- Direct Employment for about 18 persons.
- Besides through allied opportunities in logistics, trading, repairing works etc. good employment potential will arise in this area, which will provide raising income levels and standards of living in the area through various service-related activities connected with the project operations.
- Benefit to State and central exchequer by way of royalty, taxes.

Towards the socio-economic development of the surrounding area, the proponent has earmarked an amount of Rs.6.0 Lakhs under Corporate Environmental Responsibility. The activities identified under CER will be implemented in a phased manner in the nearby Government school. In consultation with the locals based on the need & priority it will be implemented.

By carrying out systematic and scientific mining and implementing all the environmental mitigative measures it will be ensured that there will be no adverse impact on this front.

4.1.8 IMPACT ON LOCAL LOGISTICAL SYSTEM DUE TO PROJECT:

The material mined out from this lease area will be directly transported to the required customers. During the project operations, there will be 4 trips/hr. The transport route will be properly maintained to absorb this traffic due to this project. The following mitigative measures are suggested for mitigation of adverse impacts on the logistical aspect of the project:

DRAFT EIA/EMP REPORT FOR ROUGHSTONE AND GRAVEL QUARRY OF TMT R. GAYATHIRI AT S.F.NO. 39/1A, 39/1B, 39/2A, 49 OVER AN AREA OF 2.302 HA IN APPANAYAKKANPATTI VILLAGE, VEMBAKOTTAI TALUK, VIRUDHUNAGAR DISTRICT, TAMIL NADU

- ❖ Water sprinkling on mineral in the transport vehicles before transporting, so that no dust nuisance during transport will arise.
- ❖ Plantation on either side of the transport road in consultation with the concerned department.
- ❖ Proper maintenance of transport road.
- ❖ Proper maintenance of transport vehicles.
- ❖ Avoiding overloading of material.
- ❖ Covering of loaded vehicles with tarpaulins sheet.
- ❖ Limiting of speed

4.1.9 WASTE MANAGEMENT:

There is no process effluent generation from this mine. Hence no liquid waste is generated. Single use plastics/ use and throwaway plastics will be banned in the site as directed by the Tamil Nadu Government vide GO(Ms)No.84 regarding ban on use of plastic products. The employees will be encouraged to use compostable material or reusable material.

5.1 ENVIRONMENTAL MONITORING PROGRAME:

Regular, systematic and sustained programme schedules for implementation and monitoring of various control measures are devised with clear cut guidelines of various concerned plans for keeping a continuous surveillance on the various environmental quality parameters in the area. The Mines Manager in the mine project site will be directly responsible for various environmental activities in the mine and will undertake effective monitoring and implementation of various environmental control measures promptly and effectively and to oversee various environmental management schemes for air quality control, water quality status, noise level control, plantation programme, social development schemes, etc in the mine. Towards EMP measures, Rs.15.40 lakhs is allocated under capital cost. Besides, Rs.10.55 lakhs per annum is allocated as recurring cost. The baseline monitoring carried out for this project reflects the cumulative impact of this existing quarry.

6.1 CUMULATIVE IMPACT STUDY:

The baseline monitoring carried out for this project reflects the cumulative impact of the existing quarries and other activities. future proposal in the cluster is studied and cumulative impact due to projects in the cluster is given in the respective EIA/EMP reports.

Combined cumulative computer Air Quality Model simulations carried out show that the resultant added concentrations with baseline figures with respect to PM₁₀ is in the range of 55.1 µg/m³ to 87.1 µg/m³ and with respect to PM_{2.5} are in the range of 25.9 µg/m³ to 41.7 µg/m³ which are within the statutory stipulations in respective case..

It is observed that the peak incremental concentration for PM₁₀, PM_{2.5} is occurring very near the source. At away from the source the values are getting drastically reduced due to dispersion effects no effect is observed. As such no adverse impact on Ambient air quality is envisaged. Cumulative Noise modeling has been carried out to determine the post project noise levels due to the mining operations of the proposed quarries and it is seen that that the post project concentration in the nearby areas are within the statutory limits of 55dB(A).

For other environmental attributes also, by implementing the mitigative measures as suggested in the report continuously and rigorously, no adverse impact on the surround environment is expected on the cumulative basis also.

7.1 CONCLUSION:

By systematic and scientific mining adhering to all the statutory norms and enforcing and strictly implementing the above said mitigation measures mentioned in this report, no adverse impact is envisaged. The proposed mining project will benefit this region in the fields of potential employment opportunities, improved income for local people, improved social welfare facilities in respect of education, medical healthcare systems, etc. in its own way and also revenue to Government through royalty, taxes etc. Besides, it will meet the raw material requirement of the construction industry also.

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