Executive Summary

Environmental Impact Assessment and Environment Management Plan for Prior Environmental Clearance

For Expansion of Dolomite and Limestone Mine from 35000 TPA (Dolomite 10714TPA+ Limestone 25000TPA) to 301463 TPA (Dolomite 53240TPA+ Limestone 248223TPA)

Project

Wanjari Limestone Mine
Village : Wanjari,
Gut No. 399,400,448
Area 25.60 Ha
Taluka : Wani
Dist. : Yavatmal (Ms)

Proponent

Smt. Faimida Parveen B. Khan
Taluka : Wani, Dist : Yavatmal

Consultant

Enviro Techno Consult Private Limited
68, Mahakali Nagar 2,
Near Manewada Squre
Nagpur 440 024

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NABET Certificate no NABET/EIA/1922RA0163

EXECUTIVE SUMMARY

Area around Wanjari village is known for limestone deposits which have remained unused. Lessee has decided to mine the quality limestone and Dolomite and make it available to the industries near Chandrapur and Nagpur.

RQP has prepared a mining plan to suit the type of deposits which are in the existing pits and can be mined by category "A" mechanized mining method without altering any tenet of environment. Lease is not a part of any forest or agricultural land or residential area. It has been purchased by Smt. Faimida Parveen B. Khan.

Mining rate will be 1005 tonnes per day including limestone and dolomite with drilling and blasting. Blasting will be twice a week as per DGMS norms.

- Government of Maharashtra has granted a 25.60 ha limestone lease for 30 years to Smt. Faimida Parveen B. Khan vide order no MMN1520/43/Desk-3 dated 12.12.2000.
- The lease is near village Wanjari in Wani tehsil in Yavatmal district (Khasra no. is 399,400,448) and Smt. Faimida Parveen B. Khan is in possession of land.
- Latitude and longitude of the lease are 20^0 06' 31.90157" - 20^0 06' 24.00"N and 78^0 55'57.87"- 78^0 55'56.75" E.
- Lease land is in possession of the project proponent. It is not a part of any forest. There is no agriculture on the land.
- SEAC issued TOR following a presentation to SEAC.
- M/s Enviro Techno Consult Private Limited of Nagpur, retained by Smt. Faimida Parveen B. Khan carried out environmental monitoring was conducted as per MOEF & CC norms for summer season (October to December, 2021
- Present summary is of the EIA report as per TOR and has been prepared as per generic structure given in Appendix III of EIA notification 2006 by MOEF & CC .
- It is proposed to mine limestone and dolomite @ 1005tonnes per day of Limestone(828 TPD) & Dolomite(177 TPD)by Category A mechanized open cast mining method.
- Limestone mining is important to Vidarbha region since there is perennial demand for quality limestone within economic distance from Wanjari. There are about 15-20 industries e.g. M/s Maharashtra Electro Smelt, M/s VinarIspatLtd., M/s Grace Industries, M/s Chaman Metallics in Chandrapur and M/s NECO, M/s FACOR etc.in Nagpur, which need limestone as raw material.
- This is a new project & RQP has prepared the mining plan for mining of limestone by maintaining proper safety standards.
- Life of the mine is 24 years mineable reserves being 6791710 ftonnes of proved category (LS 5593173 T & DL 1198537 T)

Lease details:

- **Total reserves –**

Description	Total Reserves(Dolomite + Limestone)	Grade of Ore
Proved (Million Tonnes)	6.792	Limestone :
Probable (Million Tonnes)	1.438	Cement Grade
Total Reserves available (Million Tonnes)	8.230	Dolomite : Lime manufacturing

- **Ore quality,% :**

Parameter (%)	Limestone	Dolomite
CaO	36.06-45.57	28.56-33.46
Fe2O3	0.38-0.81	0.15-0.65
Al2O3	0.6-2.65	0.36-1.33
MgO	5.14-11.40	14.31-16.79
SiO2	3.73-12.77	6.91-11.95
Loss of Ignition	38.09-45.69	39.88-42.40

- **Geology:**

  Limestone & dolomite is spread over central and southern part of the lease. It is jet black to grey in colour, fine grained and compact.

  The local stratigraphic sequence deciphered in and around the area is as under;

  Soil / Murrum Recent to sub recent

  Limestone ,magnesianLst./ Lower Vindhyan Formation

- Limestone is spread over central and southern part of the lease.It is jet black to grey in colour, fine grained and compact. It occurs in bedded form and is intermixed with Dolomite .There are no sensitive receptors or ecosystems or water bodies in core and buffer zones.
- Village Wanjari is at 0.5 km.
- There is no agriculture on the lease.
- There are no eco sensitive areas within 10 km of the lease. There are no industries within this area.
- Present appearance of lease is shown below

Proposed mining

- Two pits of sizes varying from 2.86 Ha exist in the lease. Their depths vary between 2 to 6 m below ground level (bgl). There are no waste dumps along these pits. There is only scanty or no soil cover over the lease.
- Mining will be by Category "A" mechanized mining method. Bench height will be 6 m and width not more than 6 m. Bench slope will be 45 °
- 9 holes will be drilled in a day and six blasts per week are planned.
- About 1970m^3 limestone will be blasted per blast as per DGMS norms.
- Depth of each 100 mm -Ø hole will be 6.0 m and in burden it will be 2.5 m, space between two holes will be 3 m.
- Existing pits in the lease will be deepened to ultimate depth of 6 m below ground level.
- Average excavation will be about 141865 m^3 / year and limestone production will be @ 99290m^3 / year (Limestone 248223 TPA) and that of dolomite 21296 m^3 / year (Dolomite 53240 TPA) presuming 300 working days a year.
- Drilling of holes, blasting and loading of ore will be necessary. Hundred mm holes will be about 6.0 m deep in limestone with 2.5m burden, spacing being 3 m between holes. Bench height will be 6 mt with width not exceeding the height.
- Tree felling will not be required as area is devoid of any trees.

EIA monitoring:

- Monitoring was conducted as per standard terms of reference for the mining industry and those mentioned in the TOR issued by SEAC. Area within 10 km radius from the lease was examined. Baseline ambient air quality, information on hydrogeology and water quality, land use etc. was collected as per MOEF&CC criteria.

  Probable impacting activities during proposed mining activity were identified. Particulate matter emissions were predicted by emission factor approach for drilling, blasting, transportation activities etc.
- Impacts on water quality quantity impacts were considered. Impact on land use, socio economic status during project activities have been considered.

Base line environmental quality:

- Air : There are no industrial gaseous -emission sources. Predominant wind directions in the order are NE(17%),ENE, S, &SSW(12 %). Average wind speed is 0.9m /sec. Calm conditions are 10.4 per cent.
- Atmospheric stability class at Wanjari is "moderately unstable to slightly unstable" during the day.Area has rural setting.
- Concentrations of criteria pollutants were found to be well below National air quality criteria viz. PM_{10} ,$PM_{2.5}$, SO_2 and NOx which are respectively 100,60,80 and 80 $\mu g/m^3$.
- Predominant emissions during open cast mining project would be generate particulate matter likely during drilling, blasting, loading/unloading and transportation activities .

- Noise: Ld, Ln &Ldn values were typical of rural background

Time in hrs.	Sampling points			
	N1 Mine lease area	N2 Wanjri village	N3 Wadgaon village	N4 Kalmana village
Range	36.2-47.2	35.8-51.6	36.2-53.4	34.4-51.2
Ld	43.9	47.8	48.8	47.1
Ln	40.0	38.6	39.2	40.0
Ldn	47.2	48.1	49.0	48.2

- Sources of noise would be during drilling and blasting. Nine holes will be drilled in a day and there would be two blasts per week.

- **Water**: There are no surface sources viz. rivers/ lake in the lease except existing pits occupying 2.86ha.Average depth of these pits is 1.5m. Thus, average storage capacity of these pit is about 30,000 m^3 if filled to the brim. Pits would collect rainwater @ 4599.9 say 4600 m^3 /year presuming 901 mm average annual rainfall. Ground water from limestone deposit areas is known to contain higher fluoride. Ground water in such areas is alkaline. There is isomorphic replacement of fluoride ions in geology by hydroxyl ions. Fluoride was more in the tube well/hand pump water samples. Fluoride has to be removed from water if this water is to be used for drinking. Alum can be used for removing fluoride.

  Surface runoffs during monsoon from lease will enter abandoned pits. Some water will evaporate and some can slowly percolate down.

  Abandoned mine pit water quality meets the criteria A-II for surface water source viz. public water supply with approved treatment equivalent to coagulation, sedimentation & disinfection (Govt. of Maharashtra resolution no 2000/326/P.K .22/3 dated 15-07-2000). It would need disinfection if it is to be used for consumption. Suspended solids, if any will settle down during long detention in the pits.

Ground water potential :Maregaon region:

Net G.W. availability	5009.5 ha. m
Draft for irrigation	747.0 ha. m
Domestic	153.71 ha. m
Gross draft	901.43 ha. m
Provision for 2025	307.24 ha. m
Water availability for irrigation	3885.69 ha. m
G.W. development	(307.24/5009.50)x 100= 17.99%
Category	safe

Ground water recharge rate by pit- water was calculated using relation area x annual rainfall x coefficient0.3 for limestone. It is likely to be 1381.5 m^3 /year. Water table is at 20 m below ground level near the lease.

Area under pits at the end of ensuing period would increase from 5111 $m^2$to 13,985.14 m^2. Ground water table will not be intercepted.

Dewatering of pits during mining will not be required. Sanitary wastewater will be generated. Toilet facility will be provided with septic tank and soak pit.

- **Soil:** Soil cover over the lease is scanty. Soils of area beyond lease are part of Wani series of soils. Ground water table is more than 10 m. Soils are moderately well drained and have slow permeability. Parent material is basalt /weathered basalt. Common use is for cotton and vegetation is neem, palas,mahua etc. Yield of cotton as per present farming practice by most land owners is one to two quintals per ha.

- **Biological :**Nearest sanctuary Tipeshwar is at 40 km to SW and Tadoba is to E at35 km of the lease. Wanjari lease is not a part of any forest. There is no tree cover over the lease. There is no wild life within 10 km.Seasonal shrubs occur over the lease during monsoon and dry out by month. Only thin soil cover is seen. Further, extraction of limestone/Dolomite will be from a pit. Only domesticated animals are seen.

- **Waste**

During mining plan period (2021-2026)mineralwasteis estimated to be 106399 m^3. Ore with CaO less than 34 per cent CaO will be rejects and subgrade material will contain CaO between 34 and 42 percent. Beneficiation is not planned.

Rejects will be dumped from east of the dump site and its height will be 6 m. Dump site is within lease. Leachates from limestone dumps will be innocuous . Soil will not be generated.

Blasting details:

Permission for blasting from DGMS has to be sought from DGMS before active mining has commenced. Mining cannotstart and blasting cannot be carried without permission from DGMS.

There would be two blasts per week. Blasting will be in the pits below ground level.

Peak particle velocity (PPV) will be calculated by U.S. Bureau of Mines formula for PPV

$V= k\{(D/Q)^{1/3}\}^{-\beta}$, where Q is charge/delay(kg) , D is distance at which vibration is measured, V is PPV in m/sec, k is coefficient depending on rock mass, β is slope of the best line of fit of V vs. $(D/Q)^{1/3}$. It is estimated that PPV will be 33.11m/sec at 20m for charge of 13.75 kg proposed in the mining plan. Therefore, any structure like blaster's shed within lease will be unaffected. Also village Wanjari is at 0.5 km will be unaffected.

Impacts

Land: There is no soil cover or agriculture. There are pits and dumps covering 2.86 ha respectively. There is no mining or agriculture over the land. One pit will be deepened during the operational phase.Hence there would not be any adverse impact on topography/drainage or on land use or agriculture. Appearance will continue to be as it is. Geological records on these limestone deposits state that considerable limestone quantity would be present in the pit after extracting limestone as per approved mining plan. Proved mineable reserves would not have been mined till the conceptual period of mine. Hence backfilling or reclamation of the mined out area is not proposed. Thus, mined out pit will be a "rainwater" storage structure till mining starts again. It is likely that recharge ground water aquifer takes place. Also reservoir water can be used for miscellaneous purposes like plantation, fish culture etc.

Already 1400m^3 of waste material is stored in waste dumps in the lease. These dumps are of murrum overburden and some soil. Dumps' heights vary from 1.5 to 2.5 m.

They have not caused any adverse impact on prevailing mine lease environment. Leachates from dumps will not contain any toxic material.

During proposed mining 106399 m^3 similar waste material will be generated. It will be stored over 5000 m^2area to a height of 12. Existing waste dumps over 25.60area will be re-arranged and stabilized. Physical stability of dump will be ensured since it will be designed as per I.B.M. norms. A garland drain will be provided to collect runoff from the dumps.

Land use in lease at present and at the end of mining plan period

Sr. No.	Area used for	Existing in ha.	At the end of review period. in ha
1.	Mining pit	2.8600	8.0500
2.	Dumping of O.B./Waste	Nil (shifted)	0.6500
3.	Dumping of O,B. Soil/ Waste	Nil	0.5000
4.	Storage of Ore	Nil	0.1,500
5.	Shed/ Building	0.0200	0.0200
6.	Road	0.1,000	0.1000
Total		2.9800	9.4700

Air :

Ground levelconcentrations as per ISCST-3 model for dispersion of air pollutants for lease area source show that there would not be any adverse impact on ambient air quality.

Water :

There would not be any impact on aquatic environment including hydrology, drainage or quality because a) there is no drain in the lease, b)ground water table will not be intercepted, c) dewatering of pits will not be required and d) limestone pit water is suitable for irrigation. Regular monitoring for fluoride content is required.

Noise:

Sources during mine operation would be drilling and blasting. Drillers would be exposed to about 75-80 dB(A). Blasting noise will be short lived. Levels are about 110 -120 dB(A) near the blast. In this case blasting would be below ground level during day time. Pit-walls would absorb the noise waves. Hence, there would not be any adverse impact. Blasters would be given personal protection equipment. There are no structures over the lease.

Biological**:**

There is no sensitive fauna and flora or endangered species in 10 km radius of the lease. Lease is not a part of any forest area. This area is not known for its biodiversity. Project proponent will carry out plantation in scientific way. It will choose local species in consultation with local forest department. Secondly State Fisheries department will be requested to carry out fish culture in abandoned mine pits.

Socioeconomic & health: There will not be any displacement on account of this project because land is in possession of Lessee. It is proposed to a) prefer employment to deserving local persons in mining related trades like loading/unloading of ore, its gradation, drilling etc. , b) train residents of Wanjarifor harvesting rain water, and sanitation practices etc., c) training in fish culture also is one activity which will be useful to local population.

Summary of measures to control of emissions:

Activity	Mitigation measures
Hole drilling	Wet drilling; Ø-100mm,Depth-6.0m in limestone, 2.5 in burden at 3m spacing
Blasting -Small Ø holes in weathered LS -Large Øholes in LS	as per D.G.M.S norms Powder factor-0.49m^3 0.49 m^3 in 0.375 kg explosive, hence 1kg explosive =1.27 m^3 49.5 m^3 in 13.75 kg explosive, = 9 tonnes
O.B.generation no top soil	106399 m^3 and will be stored over 5000m^2, height- 12m.

Transportation	Will be in covered -tipper trucks (22 no.) over macadamized roads.
Plantation	Over 10000 $m^2$and in safety zone
Dewatering of pits	Ground water table will not be intercepted thus dewatering of pits will not be required. Rain water in pits will be used for dust control.

Monitoring schedule :

Env. segment	Parameter	Frequency
Water quality	IS 10500	monthly
G.W. table	Fluctuation in monsoon & post monsoon period	May & October
AAQ	Particulate matter PM_{10} & $PM_{2.5}$	during drilling, blasting fortnightly
Noise	Equi. noise levels	during drilling, blasting fortnightly
Vibration	before starting mining	during blasting each month
Health	Pulmonary function, eye sight, audiometry,B.P., etc.	Annual record
Plantation	Survival	annual survival rate
Data analyses	Efficiency of mitigation measures	monthly

Plantation :

About 1250 saplings will be planted in 7.5-10 m wide safety zone. One cubic metre pits will be made along the border and will be filled with local soils from lease. Refuse or garbage will be added as per availability. Growth in the first year will be observed. Species will be chosen from the following and depending on availability.

Common name	Botanical name
Vad	Ficusbenghalensis
Neem	Azadirachtaindica
Peepal	Ficusreligiosa
Gulmohar	Delonixregia

Safety measures

Blasting :Shots will be muffled to avoid flying fragments beyond 10m. Adequate warning by siren to reach 500m .Protective shelters for workers. Use of PPE will be compulsory.

Corporate Social Responsibility:

A few are mentioned below:

- Supply of fluoride –free drinking water-
  Fluoride removal plants based on electrochemical method will be installed on fluoride infested hand pumps in nearby villages within 5 km radius. Approximate cost is Rs.50,000/- per unit
- Smt. Faimida Parveen B. Khan will organize awareness camp amongst villagers to educate people on i) health -impact of excessive fluoride in water, ii) need for sound sanitation practice particularly with regard to water quality and sullage/gray water management,
  iii) narrow bore sewerage in suitable habitations etc. Appropriate allocation of funds on yearly basis will be requested from Government.
  CSR - funds

Activity	Anticipated funds/year Rs
Supply of fluoride free water	Treatment plant -Rs 50,000-75,000/-/unit
Awareness camps	Rs. 50,000
Training for fish culture in pit water	Rs. 25,000

N.B. Costs are indicative

Economics of project :

Limestone deposits at Wanjari are of good quality. It has high percentage of CaO and low silica. These have been lying unused for various reasons. There is market for limestone in and around deposits. Land is non- productive and unsuitable for agriculture. Therefore mining will be in the interest of State revenue and of the people around. Direct and indirect employment to locals is assured.

Lease is a waste land. It has no tree cover. There are abandoned pits. Water in pits is used. Therefore there would not any damage to environmental quality.

Initiation of mining by Lessee will improve revenue to the state without deterioration in environmental quality. On the contrary population in nearby villages will become aware of importance of potable water quality and sanitation.

Openings for indirect employment to locals in plantation, fish culture are possible. Additional water supply source in form of pit-water, recharge of aquifer is likely.