

**EXECUTIVE SUMMARY**

**OF**

**DRAFT ENVIRONMENTAL IMPACT  
ASSESSMENT REPORT**

**FOR**

**Proposed Standalone Grinding Unit  
with Cement Production Capacity of  
2.0 MTPA along with D.G. Set of 500 KVA**

**At**

**Village: Kachewani, MIDC Industrial area,  
Taluka: Tirora, District: Gondia (Maharashtra)**

**APPLICANT**



**M/s. Orient Cement Limited**

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## EXECUTIVE SUMMARY

### i) Project name and location (Village, District, State, Industrial Estate (if applicable))

M/s. Orient Cement Ltd. is proposing a Standalone Grinding Unit with Cement Production Capacity of 2.0 MTPA and D.G. Set of 500 KVA at Village: Kachewani, MIDC Industrial area, Taluka: Tirora, District: Gondia (Maharashtra).

As per EIA Notification dated 14<sup>th</sup> Sept., 2006, and as amended thereof; the project falls under Category “B”, Project or Activity ‘3(b)’ - Cement Plants. Since, the Eco-Sensitive Zone of Nagzira, New Nagzira Wildlife Sanctuary, Koka Wildlife Sanctuary, Navegaon Wildlife Sanctuary and Navegaon National Park falls at a distance of ~1.84 km from the proposed project site; General condition is applicable on the project. Therefore, the project will be treated as Category - “A” project and appraised at Central Level (MoEFCC, New Delhi).

Application (Form-1 and PFR) has been submitted to MoEFCC, New Delhi on 08<sup>th</sup> December, 2021 and subsequently ToR Letter was issued by MoEFCC, New Delhi vide letter no. IA-J-11011/529/2021-IA-II (IND-I) dated 24<sup>th</sup> January, 2022.

### ii) Products and capacities - If expansion is proposed, then existing products with capacities and reference to earlier EC.

#### Proposed products along with capacities of the proposed project proposal

S. No.	Particulars	Unit	Proposed Capacity
1.	Cement	Million TPA	2.0
2.	D.G. Set	KVA	500
3.	Railway Siding	Railway Siding	

Source: Pre-Feasibility Report

### iii) Requirement of land, raw material, water, power, fuel with source of supply (Quantitative)

a) **Land requirement** - Total project area is 13.77 ha. Out of the total project area, ~ 4.54 ha (33 % of the total project area) area will be covered under greenbelt / plantation.

#### b) Raw material Requirement

S. No.	Raw Material	Quantity (Million TPA)	Source	Approx. Distance & Mode of Transportation
1.	Clinker	1.31	Integrated Cement plant of M/s. OCL at Devapur	273 Km / by Rail
2.	Gypsum	0.06	Vizag/ Paradip and from Adani Power Maharashtra Ltd. (APML)	750 - 800 Km / by Road
3.	Fly ash	0.63	Adani Power Maharashtra Ltd. (APML)	2.5 Km / by Road / Pneumatic system

Source: Pre-feasibility Report

**c) Fuel Requirement**

S. No.	Fuel	Quantity (KLD)	Sulphur, (max %)	Ash (max %)	Calorific Value kCal / kg	Source	Approx. Distance & Mode of Transportation
1.	Diesel	2.64	0.25	0.01	10800	IOCL, Nagpur	130 kms / By Road

**d) Basic requirement for the project**

S. No.	Particular	Detail	Source	
1.	Water Requirement (KLD)	300	Adani Power Maharashtra Limited (APML) by tapping from their cooling towers.	
2.	Power Requirement (MW)	10	Maharashtra State Electricity Board	
3.	Manpower Requirement (No. of persons)	Total Manpower requirement is 818 persons (118 persons direct and 700 people indirect).	Unskilled / Semi-skilled - local area and Skilled - outside / local	
		<b>Implementation Phase:</b>		
		Direct		28
		Indirect		500
		<b>Operational Phase:</b>		
		Direct		90
Indirect	200			

Source: Pre-feasibility Report

**iv) Process description in brief, specifically indicating the gaseous emission, liquid effluent and solid and hazardous wastes.**

The Proposed Grinding unit is based on Dry Process Technology for Cement manufacturing and Technology that will be used for manufacturing of cement in proposed Grinding unit is Vertical Roller Mill (VRM). Major steps involved in the process of Cement manufacturing in the Grinding unit are given as below:

- ∞ Clinker Storage & Handling
- ∞ Fly Ash Storage & Handling
- ∞ Gypsum Storage & Handling
- ∞ Cement Production & Storage
- ∞ Cement Packaging & Dispatch

**v) Gaseous emission, liquid effluent and solid and hazardous wastes**

Emissions	Source		Mitigation measures
	Plant Unit	Section	
PM	Grinding Unit	Cement Mill	Installation of Bag House

Emissions	Source		Mitigation measures
	Plant Unit	Section	
Fugitive Emission	Grinding Unit	Raw Material Handling & Storage	<ul style="list-style-type: none"> <li>Covered Conveying System will be provided for transfer of raw materials/finished products.</li> <li>De-dusting/Nuisance filters will be provided at all material transfer points</li> <li>Fly ash will be received through closed bulkers &amp; fed into silo through pneumatic system.</li> <li>Clinker, fly ash and cement will be stored in the silos.</li> <li>Gypsum will be stored in the covered sheds.</li> <li>Water sprinkling will be done to control dust.</li> <li>Road sweeping machines will be used</li> <li>Proper maintenance of vehicles will be done to reduce gaseous emissions</li> <li>PUC certified vehicles will be used</li> <li>Greenbelt/ plantation (in 4.54ha i.e., 33 % of the total project area) will be done along the project boundary to attenuate air pollution.</li> </ul>
		Transportation activity	

**b. Details of Effluent and their Mitigations**

Effluents	Plant Unit	Mitigation measures to be adopted
Process Water	Process	<ul style="list-style-type: none"> <li>Grinding unit is based on the dry process technology.</li> <li>Water used for cooling at various stages of cement manufacturing will be partially evaporated and partially recycled; hence, no waste water will be discharged.</li> <li>Hence, zero liquid discharge will be maintained in Grinding Unit.</li> </ul>
Sewage	Domestic Utilities	Domestic waste water (15 KLD) generated from office toilets and canteen will be treated in STP of 20 KLD capacity and treated water (12 KLD) will be used for greenbelt development / plantation.

**c. Details of Solid & Hazardous waste generation and their Mitigations**

Plant Unit	Section	Type of Waste	Waste	Quantity	Treatment / Disposal
Grinding Unit	APCE	SW	Dust	30 kg/hr	Dust collected from various APCEs will be totally recycled into the process.
STP	-	SW	STP Sludge	~ 2 kg/day	Used as manure for greenbelt development / plantation
Plant Maintenance	Different sections	HW	Used Oil / Spent Oil (5.1) and Waste	~ 20 KL/Annum	Will be Sold to the CPCB / SPCB authorized recyclers
			Empty Barrels	100 Nos./annum	
MSW	Plant Canteen	Dry	Bottles, paper, cans, textile, etc.	50 kg/month	Will be sold to authorized recycler.
		Wet	Kitchen and canteen/ Green waste	150 kg/month	Will be Disposed after segregating into bio-degradable and non-degradable waste.

Plant Unit	Section	Type of Waste	Waste	Quantity	Treatment / Disposal
Used Lead acid batteries	-	HW	-	10 Nos/annum	Sold to registered vendors as per prevalent rules.

**d. Material Balance: -**

Material / Mass Balance Diagram for manufacturing of OPC & PPCs shown below:

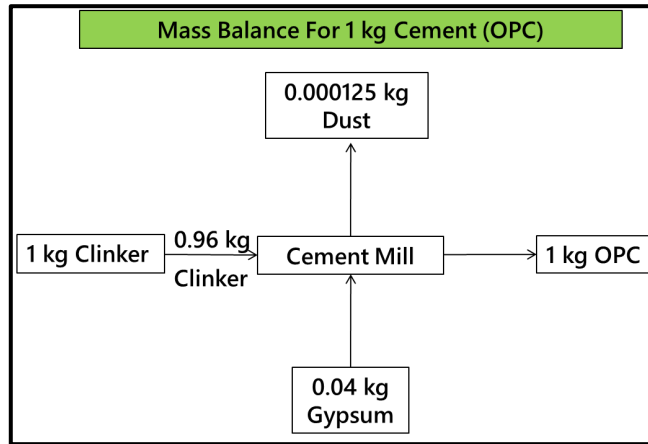


Figure 1 (a): Mass Balance Diagram for OPC

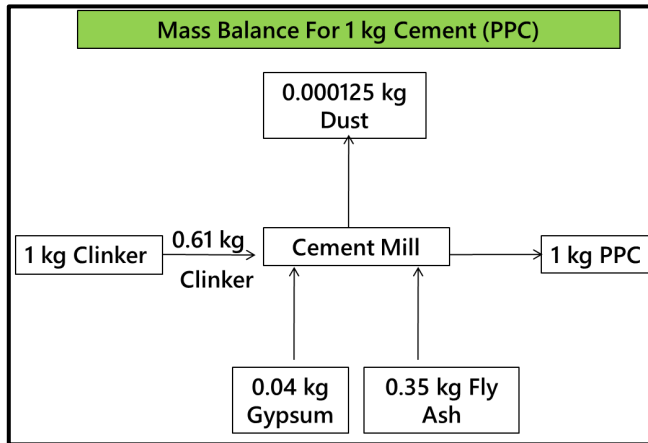


Figure 1 (b): Mass Balance Diagram for PPC

**v) Measures for mitigating the impact on the environment and mode of discharge or disposal.**

Particulars	Details
Air Quality Management	<ul style="list-style-type: none"> <li>⌘ Installation of Bag House along with cement mill stack.</li> <li>⌘ Enclosures will be provided for unloading operations.</li> <li>⌘ Bag filters will be installed at all transfer points to reduce fugitive dust emissions.</li> <li>⌘ All the roads inside the plant premises will be concreted.</li> <li>⌘ Regular sweeping of all the roads &amp; floors will be done.</li> <li>⌘ Dust collected from air pollution control equipment will be totally recycled in the process.</li> <li>⌘ Fly ash will be pumped directly from the bulkers to silos pneumatically in closed loop such that fugitive emissions do not occur.</li> <li>⌘ The packing machines will be equipped with dust extraction arrangement.</li> </ul>

Particulars	Details
Water Management	<ul style="list-style-type: none"> <li>☞ Domestic waste water (15 KLD) generated from office toilets and canteen will be treated in STP of 20 KLD capacity and treated water (12 KLD) will be used for greenbelt development / plantation.</li> <li>☞ Rain Water Harvesting will be practiced within the plant premises.</li> </ul>
Rain Water Harvesting	<ul style="list-style-type: none"> <li>☞ Total Artificial Rainwater harvesting inside the Grinding unit is 41970.19 cum/year.</li> <li>☞ Net development inside the Grinding unit is 62%.</li> </ul>
Noise Management	<ul style="list-style-type: none"> <li>☞ Equipment generating excessive noise will be kept in properly insulated enclosures</li> <li>☞ Improved silencers within the equipment generating high noise</li> <li>☞ Isolation of continuously vibrating structures/ machines by proper and secured mountings</li> <li>☞ Proper maintenance, oiling and greasing of machines at regular intervals to reduce generation of noise.</li> <li>☞ Personal Protective Equipment (PPEs) like earplugs and earmuffs will be provided to the workers exposed to high noise level.</li> <li>☞ Development of greenbelt of appropriate width inside the plant premises and at the plant boundary.</li> <li>☞ Regular monitoring of noise level and corrective measures accordingly.</li> </ul>
Solid & Hazardous Waste Management	<ul style="list-style-type: none"> <li>☞ No solid waste will be generated from the cement manufacturing process.</li> <li>☞ Dust collected from various air pollution control equipment will be recycled in the process.</li> <li>☞ STP Sludge will be used as manure in Greenbelt/ Plantation development.</li> <li>☞ Used oil / Spent oil &amp; waste (~20 KL / Annum) and Empty Barrels (100 Nos./ annum) will be generated as per Schedule - I of Hazardous and Other Wastes (Management and Trans boundary Movement) Rules, 2016; which will be sold to CPCB/ SPCB authorized recycler.</li> </ul>
Greenbelt Development / Plantation	<ul style="list-style-type: none"> <li>☞ Out of total plant area of 13.77 ha, greenbelt / plantation will be developed in 4.54 ha i.e., 33% of the total project area.</li> <li>☞ Native species i.e., <i>Mangifera indica</i> (Mango), <i>Azadirachta indica</i> (Neem), <i>Ficus parasitica</i> (Bargad), <i>Gmelina arborea</i> (White Teak), <i>Cassia fistula</i> (Amaltas), etc. will be planted under proposed greenbelt development.</li> </ul>

**vi) Capital cost of the project**

S. No.	Particular	Details
1.	Total Cost of the Project	Rs. 499.16 Crores
2.	Cost for Environmental Protection Measures	Capital Cost: Rs. 50.0 Crores
		Recurring Cost: Rs. 5.0 Crores / annum

**vii) Site selected for the Project-Nature of land- agricultural (single/double crop), barren, Govt. /private land, status of its acquisition, nearby (in 2-3 km) water body, population, within 10 km other industries, forest, eco-sensitive zones, accessibility (Note- in case of industrial estate this information may not be necessary).**

**a) Nature of land**

The project area falls in MIDC industrial land. Total project area is 13.77 ha. Out of the total project area, approx. 4.54 ha (33 % of the total project area) area will be covered under greenbelt / plantation.

**b) Nearby (in 2-3 km) water body, forest, eco-sensitive zones, accessibility**

<b>S. No.</b>	<b>PARTICULARS</b>	<b>DETAILS</b> (With approximate aerial distance & direction from the nearest project boundary)
1.	Nearest Village	Kachewani (1.5 km in NNE direction)
2.	Nearest Town & City	Tirora (5.5 Km in WSW direction)
3.	Nearest National Highway / State Highway	SH - 249 (0.1 Km in NW direction)
4.	Nearest Railway station	Kachewani Railway Station (0.1 Km in North direction)
5.	Nearest Airport	Nagpur International Airport (103 km in WSW direction)
6.	National Parks, Wildlife Sanctuaries, Biosphere Reserves within 10 km radius.	Nagzira Wildlife Sanctuary is located at a distance of ~ 10.6 km from the project site and as per the MoEFCC Notification S.O. 612 (E) dated 25 <sup>th</sup> February, 2016; the extent of Eco-sensitive Zone of Nagzira, New Nagzira Wildlife Sanctuary, Koka Wildlife Sanctuary, Navegaon Wildlife Sanctuary and Navegaon National Park lies at a distance of ~ 1.84 km from the project site.
7.	Reserve Forest (RF) / Protected Forest (PF) etc. within 10 km radius.	<ul style="list-style-type: none"> <li>o Kondebarra RF (5.5 km in ESE direction)</li> <li>o RF (8.5 km in NE direction)</li> <li>o RF (9.0 km in ENE direction)</li> </ul>
8.	Water Bodies (within 10 km radius)	<p>There are 13 water bodies within 10 km radius of the study area</p> <ul style="list-style-type: none"> <li>o Wainganga River (8.0 km in NW direction)</li> <li>o Bodalkasa Nadi (2.0 km in SSW direction)</li> <li>o Bodalkasa Right Main Canal (0.5 km in NW direction)</li> <li>o Kharbanda Left Canal (3.0 km in NNE direction)</li> <li>o Sangrampur Main Canal (3.5 km in East direction)</li> <li>o Bodalkasa Left Bank Canal (6.5 km in WSW direction)</li> <li>o Amba Nala (5.0 km in SE direction)</li> <li>o Khadhandha Nala (9.5 km in NNE direction)</li> <li>o Kharbanda Tank (9.0 km in NE direction)</li> <li>o Bodalkasa Tank (8.0 km in SSE direction)</li> <li>o Sangrampur Talav (4.5 km in ESE direction)</li> <li>o Ramanghata Talav (8.0 km in SSW direction)</li> <li>o Hari Talav (8.5 km in East direction)</li> </ul>
9.	Seismic Zone	Zone - II as per IS: 1893 (Part-I): 2002

**c) List of industries within 10 km radius study area**

List of major industries falling within 10 km radius of the project site (i.e., study area) is given below:

**Table - 3.2**  
**Industries falling in the study area**

<b>S. No.</b>	<b>Name of the Company</b>	<b>Type of Industry</b>	<b>Approx. Distance and direction from project site</b>
1.	Adani Power Maharashtra Limited	Thermal Power Plant	1.0 km in SW direction

Source: Field Survey



viii) **Baseline environmental data- air quality, surface and ground water quality, soil characteristic, flora and fauna, socio economic condition of the nearby population.**

a) **Baseline Environmental Data (Air, Noise, Water & Soil)**

Baseline study of the study area was conducted during *Post-Monsoon Season (Oct., to Dec., 2021)* Ambient air quality monitoring has been carried out at eight locations in the study area on 24 hourly basis. The concentration of PM<sub>2.5</sub> varied between minimum – 23.5 µg/m<sup>3</sup> (at village Garada) to maximum – 51.0 µg/m<sup>3</sup> (at Town Tirora) and the concentration of PM<sub>10</sub> varied between 46.5 µg/m<sup>3</sup> (at village Garada) to 80.9 µg/m<sup>3</sup> (at Town Tirora), SO<sub>2</sub> ranges between 5.48 µg/m<sup>3</sup> to 12.04 µg/m<sup>3</sup> and NO<sub>2</sub> ranges between 9.29 µg/m<sup>3</sup> to 29.35 µg/m<sup>3</sup> CO concentration was found to be maximum at Project Site (0.94 mg/m<sup>3</sup>), minimum (0.52 mg/m<sup>3</sup>) at village Dhamnewara & BDL at villages Garada & Nimgaon. Benzo(a)pyrene (BaP) concentration was observed as BDL at all locations.

**As per specific ToR point (vi)**, One-month additional baseline study (for the month of February) data with one additional location – Village Jamuniya in NW direction was also conducted. The concentration of PM<sub>2.5</sub> varied between 23.2 µg/m<sup>3</sup> (at village Garada) to maximum – 51.8 µg/m<sup>3</sup> (at Town Tirora) and the concentration of PM<sub>10</sub> varied between 46.9 µg/m<sup>3</sup> (at village Garada) to 82.1 µg/m<sup>3</sup> (at Town Tirora), SO<sub>2</sub> ranges between minimum 5.27 µg/m<sup>3</sup> (at Village Dhamnewara) to maximum 12.36 µg/m<sup>3</sup> (at Sampling Station near Adani Power Maharashtra Ltd.) and NO<sub>2</sub> ranges between 9.40 µg/m<sup>3</sup> (at village Garada) to maximum 29.87 µg/m<sup>3</sup> (at Town Tirora). CO concentration varied between minimum (0.52 mg/m<sup>3</sup>) at Village Jamuniya & BDL at Village Garada & Village Nimgaon to maximum 0.92 mg/m<sup>3</sup> (Sampling Station near Adani Power Maharashtra Ltd).

Ambient noise levels were measured at eight locations around the proposed site. Noise levels varied from 51.3 Leq dB to – 56.8 Leq dB (A) during day time and from 41.4 Leq dB to 46.3 Leq dB (A) during night time.

**As per specific ToR point (vi)**, One-month additional baseline study (for the month of February) data with one additional location – Village Jamuniya in NW direction was also conducted. Noise levels varied from 51.7 Leq dB (A) (near ESZ of Nagzira Wildlife Sanctuary) to maximum – 57.2 Leq dB (A) (at Project Site) during day time and from 41.2 Leq dB (A) (near ESZ of Nagzira Wildlife Sanctuary) to 46.1 Leq dB (A) (at Project Site) during night time.

There are 13 surface water bodies present in the study area. Surface water was collected from 8 locations and rest was found dry during the study period. pH varied from 6.98 to 7.45, Total Hardness (89.1 to 202.9 mg/l), Total dissolved solids (217 to 432 mg/l), total alkalinity (80.7 to 198.45 mg/l) and conductivity (352 to 684 µS/cm). The COD varied between 8.0 to 20.0 mg/l and BOD varied from 2.4 to 5.2 mg/l.

The ground water analysis for all the eight sampling stations showed that pH varies from minimum 7.12 at Village Dongargaon to maximum 7.82 at village Ekodi, Total hardness varied from 264.5 mg/l at (Village Dongargaon) to 618.5 mg/l at (Village Dhamnewara), Total dissolved solids varied from 547.0 mg/l at project site to 1257.0 mg/l at (Village Dhamnewara). The color and turbidity were found to be BDL (DL 5.0) and BDL (DL 1.0) respectively at all the sampled locations. The concentration of

chloride was found to be varying from 93.35mg/l at Project site to 398.56 mg/l at Village Dhamnewara and sulphate from 37.62 mg/l at village Dongargaon to 100.20 mg/l at Village Dhamnewara), Magnesium (17.47 mg/l at Village Mendipur to 37.20 mg/l at Project site; Calcium - 67.30 mg/l at Project site to 193.31 at village Berdipar); Iron varies from (0.02 at village Mendipur to 0.36 mg/l at Project site); Fluoride varies from (0.12 mg/l at Dongargaon to 1.31mg/l at village Dhamnewara).

Soil monitoring was carried out at eight locations and the analysis results show that soil quality are slightly acidic to moderately alkaline in nature, pH value ranging from 6.66 to 7.54 with organic matter from 0.10% to 0.21%. Soil texture is sandy clay to sandy silt. Total nitrogen ranges from 147.39 kg/ha at village Ekodi to 329.28 kg/ha at Village-Dhamnewara, indicates that nitrogen is in better amount in this soil; Phosphorous is present in the range of 29.17 kg/ha at Village Dongargaon to 88.57 kg/ha at Village-Dhamnewara which is in an average amount, whereas the Potassium is found to be ranging from 286.5 kg/ha at Village Mendipur to 580.7 kg/ha at Town Tirora which is present in average amount in soil, magnesium is found to be ranging from 432.64mg/kg at Village Berdipar to 950.09 mg/kg at Village Paldongri and calcium is found to be ranging from 4140.58 mg/kg at village Ekodi to 6350.07 mg/kg at Village Paldongri and sodium is found to be ranging from 106.6 mg/kg at Village-Berdipar to 190.3mg/kg at Project site.

## b) Biological Environment (Flora & Fauna)

### Floral Diversity

- Total of 20 species of trees, 14 species of shrubs, 26 species of Herbs, 17 species of grasses and 03 types of climbers and were recorded based on primary observation as well as based on information collected from the secondary data within the 10 Km study area.
- As per the field survey and list of Flora by ENVIS, MoEFCC; there is no endemic, endangered and rare species of flora observed under threatened status in the study area.

### Faunal Diversity

- Among fauna, total of 17 species of mammals, 10 species of Reptiles, 13 species of Butterflies, 19 avifaunal species were recorded in the 10 km study area.
- No avifaunal species found in the buffer zone falls in *Critically Endangered (CR)* category
- No faunal species enlisted under endangered (EN) category as per IUCN Red list.
- Based on primary field survey and secondary data collected, Three Schedule-I species including avi-faunal species viz. *Pantherapardus* (Common Leopard), *Varanus bengalensis*, (Indian Monitor Lizard) and *Pavo cristatus* (Peafowl) were recorded in the study area as per (IWPA) Indian Wildlife Protection Act, 1972.
- Conservation Plan for the Schedule-I species is under process.

## c) Socio-Economic Environment

The population as per 2011 Census records is 83,481 (for 10 km radius). Schedule Caste population of the study area is 9119 and Scheduled Tribe is 10653. Literacy rate of the area is 65.9 % & sex ratio is

979. Population of the workers engaged in occupation is 39177. Out of the total population, 25001 persons are main workers, 14176 persons are marginal workers and remaining 44304 persons are considered as non-workers.

ix) **Identification of hazards in handling, processing and storage of hazardous material and safety system provided to mitigate the risk.**

**Risk Assessment table along with mitigation measures**

S. No.	Activity	Associated hazards	Associated Risk/ Health Impacts	Mitigation Measures
1.	Storage & handling of raw material	Heat, Fire & dust	Exposure, physical injuries, burning, air pollution due to fugitive emissions	<ul style="list-style-type: none"> <li>• Use of PPEs.</li> <li>• Continuous water sprinkling</li> <li>• Training to workers for proper handling</li> <li>• Proper system for loading &amp; unloading operations</li> <li>• Firefighting &amp; first aid facility.</li> <li>• Storage should be away from ignition source</li> <li>• Proper housekeeping facilities</li> </ul>
2.	Working in Grinding Unit	Heat, Fire, Dust, Smoke & Explosion	Physical injuries, burning, air pollution	<ul style="list-style-type: none"> <li>• Firefighting &amp; first-aid facility</li> <li>• Use of PPEs.</li> <li>• Use of proper APCDs like Bag house /Bag Filters</li> <li>• Inspection &amp; regular monitoring</li> <li>• Training to workers for proper handling of raw materials</li> </ul>
3.	APCD failure	Release of PM in ambient air	Air pollution	<ul style="list-style-type: none"> <li>• Regular monitoring &amp; inspection will be done.</li> <li>• The plant shall immediately shut down on APCD failure</li> </ul>
4.	Working at height	Slip, trips & falls of operators	Physical injuries	<ul style="list-style-type: none"> <li>• Individual alertness of the workers.</li> <li>• First aid boxes shall be provided</li> <li>• Use of PPEs</li> </ul>
5.	Electrical maintenance work	Electric shock, short circuits in power room	Electrical shocks, Injury or burn	<ul style="list-style-type: none"> <li>• Regular checking and maintenance of electrical units</li> <li>• Use of PPEs</li> <li>• Provision of First aid box</li> </ul>
6.	Working near D.G. sets during emergency	High noise	Noise induced hearing losses	<ul style="list-style-type: none"> <li>• Provision of PPEs to the workers.</li> </ul>

x) **Likely impact of the project on air, water, land, flora-fauna and nearby population.**

S. No.	Project Activity	Aspect	Impact	Mitigation Measures
1.	Transportation of Clinker and	Fugitive Dust Emission	<ul style="list-style-type: none"> <li>▪ Increase in the fugitive dust concentration in the</li> </ul>	<ul style="list-style-type: none"> <li>• Use of PUC Certified vehicles</li> </ul>

S. No.	Project Activity	Aspect	Impact	Mitigation Measures
	other raw materials by road		ambient air which will affect the biotic environment	<ul style="list-style-type: none"> <li>• Vehicles to be covered with tarpaulin and not over loaded</li> <li>• Speed limit to be maintained</li> <li>• Paved road in plant premises</li> </ul>
2.	Material storage and handling		<ul style="list-style-type: none"> <li>▪ Increase in the fugitive dust concentration in the ambient air</li> <li>▪ Workers affected by respiratory diseases due to working in the high dust-zone area</li> </ul>	<ul style="list-style-type: none"> <li>• Clinker, Cement and Fly Ash stored in silos.</li> <li>• Covered yard for storage of Gypsum.</li> <li>• Fly ash received through closed bulkers &amp; fed into Silo through pneumatic system.</li> <li>• Personal Protective Equipment to the workers</li> </ul>
3.	Cement Mill	Particulate Matter Emission & Fugitive Dust Emission	Increase in Particulate Matter and fugitive dust concentration in air environment	<ul style="list-style-type: none"> <li>• Installation of Bag House with cement mill stack.</li> <li>• Better maintenance of pollution control equipment like Bag Filters and Bag House etc.</li> <li>• Development of greenbelt / plantation all along the plant boundary.</li> </ul>
		Noise generation due to Exhaust fans and Cement grinding	<ul style="list-style-type: none"> <li>▪ Increase in noise levels near source generation</li> <li>▪ Hearing impairments</li> <li>▪ Other health effects</li> </ul>	<ul style="list-style-type: none"> <li>• Earmuffs/ Earplugs to persons working in high noise zone.</li> <li>• Proper lubrication &amp; maintenance of machinery</li> <li>• Development of greenbelt / plantation within the plant premises</li> <li>• Periodic Occupational Health Surveillance of worker</li> </ul>
4.	Cement Packing & Dispatch	Fugitive Dust Emission	<ul style="list-style-type: none"> <li>▪ Area source - Increase in fugitive dust concentration in air environment</li> <li>▪ Respiratory Diseases</li> </ul>	<ul style="list-style-type: none"> <li>• Dust extraction arrangement</li> <li>• Spilled cement collected and recycled</li> <li>• Installation of Bag Filters at transfer points</li> <li>• Development of greenbelt</li> <li>• Personal Protective Equipment (Goggles, Mask etc.) to worker.</li> <li>• Periodic Occupational Health Surveillance</li> </ul>

**xi) Emergency preparedness plan in case of natural or in plant emergencies.**

M/s. Orient Cement Limited will have an Emergency Plan (Onsite & offsite) at the project site. Suitable Risk Control Measures with respect to Risk Assessment will be implemented to minimize the risk to an acceptable level. Regular Training, Implementation of SOPs and compliance of

relevant Personal Protective Equipment's (PPEs) will help to minimize the health hazards and incidental casualties.

**xii) Issues raised during public hearing (if applicable) and response given.**

Public Hearing Notice for the proposed project is yet to be conducted.

**xiii) Socio-economic Development Plan with proposed expenditure**

As per MoEFCC O.M. dated 30<sup>th</sup> Sept., 2020 & OM dated 20<sup>th</sup> Oct., 2020; Socio-Economic Developmental activities will be formulated on the basis of the issues raised during public hearing which will be addressed in EMP & will be implemented in a time bound manner with the start of the plant implementation.

**xiv) Occupational Health Measures**

Discipline	Anticipated Impact	Mitigation Measures
<b>Construction Phase</b>		
Air	Increase in dust and NO <sub>x</sub> concentration due to levelling activity and Heavy vehicular movement	<ul style="list-style-type: none"> <li>* Sprinkling of water in the construction area and on unpaved roads.</li> <li>* Proper maintenance of vehicles.</li> <li>* Use of vehicles meeting PUC norms</li> </ul>
Noise	Increase in noise level due to Construction Equipment	<ul style="list-style-type: none"> <li>* Equipment will be kept in good condition to keep the noise level within 90 dB(A).</li> <li>* To provide necessary protective equipment e.g., ear plugs, earmuffs.</li> </ul>
Water	Increase in suspended solids due to soil run-off during heavy precipitation due to lose soil at construction site	<ul style="list-style-type: none"> <li>* Adequate drainage system for runoff water during construction phase.</li> </ul>
Solid waste	Construction waste	<ul style="list-style-type: none"> <li>* Construction waste will be used for land filling.</li> </ul>
<b>Operation Phase</b>		
Air	Increase in concentration of Particulate Matter Emissions	<ul style="list-style-type: none"> <li>* Installation &amp; maintenance of pollution control equipment like Bag House / Bag Filters.</li> <li>* Storage of clinker, fly ash and cement in silos.</li> <li>* Storage of gypsum in covered shed.</li> <li>* All the roads inside the plant premises will be concreted.</li> <li>* Vacuum Sweeping for better housekeeping will be done.</li> <li>* Greenbelt will be developed around/ within the Plant premises.</li> <li>* CPCB and CREP guidelines will be followed.</li> </ul>
Noise	Increase in noise level within the plant area	<ul style="list-style-type: none"> <li>* Equipment installed is designed to conform to occupational noise levels prescribed by regulatory agencies.</li> <li>* Earmuffs/ Earplugs will be provided to persons working in high noise zone.</li> <li>* Properly insulated enclosures will be provided to equipment making excessive noise.</li> <li>* Silencer will be provided to all safety valves of the plant to control Noise level.</li> <li>* Proper and regular Oiling and Greasing of machines will be done.</li> </ul>

Discipline	Anticipated Impact	Mitigation Measures
		* Greenbelt development / plantation will help in attenuating noise.
Water	Waste water generation	* Domestic waste water from plant office and toilets will be treated in STP and treated water will be used in Greenbelt/Plantation.
Soil	Degradation of soil quality due to settling of air borne dust	* Use of efficient pollution control systems * Proper stack height
Solid and Hazardous waste	Generation of solid waste	* Dust collected from various air pollution control equipment will be recycled into the process. * Sewage sludge generated from STP will be used as manure in greenbelt development/ plantation. * Solid waste generated from canteen will be vermin-composting and will be used as manure. * Used Oil (Cat 5.1) & Waste residue (contaminated cotton rags) (Cat 5.2) containing oil will be sold to CPCB authorized recycler.
<b>Biological Environment</b>		
a. Terrestrial Ecology	Positive as greenbelt of appropriate width will be developed and maintained by the company in future.	-
b. Aquatic Ecology	No impact, as no effluent will be discharged outside the plant premises	-
c. Socio-economic Environment	Overall development of the area in respect of the infrastructure development, educational growth, health facilities etc.	-

xv) **Post project monitoring plan**

**Frequency and location for post-project monitoring**

S. No.	Description	Location	Frequency of Monitoring
1.	Ambient Air Quality	Project Boundary in upwind & downwind direction and as per EC / CTO conditions	Twice a week & Continuous Online Monitoring
2.	Fugitive Emission Monitoring	Cement Mill, Packing Plant, Raw Materials Handling Area	Quarterly / As per EC/CTO
3.	Stack Emission Monitoring	Cement Mill Stack	Monthly/Continuous Online Monitoring
4.	Noise Level Monitoring	Project Boundary, High noise generating areas within the Project Boundary and as per CTO conditions	As per EC/CTO
5.	Ground Water Level & Quality	Nearby Ground water sources	Pre-Monsoon & Post-Monsoon
6.	Waste water Monitoring	Inlet and outlet of STP	As per CTO
7.	Medical Checkup of Employee	Dispensary/ Health Centre	Yearly as per Factory Act
8.	Performance evaluation of APCE's / Adequacy Study	Cement Mill Bag House	Yearly

