EXECUTIVE SUMMARY

OF

ENVIRONMENTAL IMPACT ASSESSMENT REPORT

&

ENVIRONMENTAL MANAGEMENT PLAN

FOR

PUBLIC HEARING

OF

Proposed Expansion of Integrated Cement Plant Clinker (4.8 to 8.1 MTPA), Cement (3.5 to 6.5 MTPA), and WHRS (18 to 43 MW) by Installation of Line- III

At
Village: Rawan, Tehsil: Balodabazar,
District: Balodabazar - Bhatapara (Chhattisgarh)

APPLICANT

Ambuja Cement

M/s. Ambuja Cements Limited

(Unit: Bhatapara)

Village - Rawan,
Tehsil - Balodabazar, District - Blodabazar-Bhatapara,
(Chhattisgarh)
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EXECUTIVE SUMMARY

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

M/s. Ambuja Cements Limited (Unit: Bhatapara) is proposing an expansion of Integrated Cement Plant (Clinker - 4.8 to 8.1 MTPA, Cement - 3.5 to 6.5 MTPA and WHRS - 18 to 43 MW) by installation of Line-III at Village: Rawan, Tehsil: Balodabazar, District: Balodabazar-Bhatapara (Chhattisgarh).

As per EIA Notification dated 14th Sept., 2006, as amended from time to time; the project falls under Category "A", Project or Activity '3(b)' Cement Plants.

Application (Form-1 and Pre-Feasibility Report) has been uploaded on MoEFCC web Portal, New Delhi on 16th Feb., 2021 and ToR Letter was issued by MoEFCC, New Delhi on 04th March, 2021.

ii) Products and capacities. If expansion proposal, then existing products with capacities and reference to earlier EC.

a) Proposed products and capacities –

Particular	Unit	Existing Granted Capacity (as per EC dated 25th Jan., 2016)	Additional Proposed Capacity	Total Capacity after Expansion
Clinker	MTPA	4.8 (Line I- 1.7 & Line II- 3.1)	Line-III - 3.3	8.1 (Line-I-1.7, Line-II 3.1 & Line-III-3.3)
Cement	MTPA	3.5	3	6.5
CPP	MW	63 (2 x 15 & 1 x 33)	Nil	63
WHRS	MW	18	25	43
D.G. Set	MW	4	Nil	4

b) Reference of earlier EC

Earlier Environmental Clearance for the existing plant has been obtained from MoEFCC, New Delhi *vide* letter no. J-11011/355/2005-IA 11 (I) Dated 25th January, 2016 in the name of M/s. Ambuja Cements Ltd. (Unit: Bhatapara).

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

a) Land requirement - Total Plant area is 238.97 ha; proposed expansion will be done within the existing plant premises; hence no additional land will be required.

Out of the total existing plant area of 238.97 ha, 34.7 % of the total area (i.e. 83 ha) has already been developed under greenbelt / plantation. Same will be maintained and enhanced in future. At present, about 201494 saplings have been planted @2427 plants/ha in the plant area. Further, density of the plants will be increased up to 2500 plants per ha by gap filling with 6000 plants.

b) Raw material Requirement & Fuel Requirement

S. No.	Name of Raw Material	Quantity Required (MTPA)			Source	Approx. Distance & Mode of Transportation
		Existing	Additional	Total After Expansion		
1.	Limestone	6.5	4.7	11.2	Captive Limestone mine	1.5 to 4 km: Belt Conveyer & road
2.	Gypsum	0.21	0.149	0.359	**Chemical Gypsum:** Paradeep Phosphate, Coromandal Fertilizers. **Mineral Gypsum:** Thailand, Oman, Local.	600 to 660 km from Port: Rail
3.	Fly ash	1.22	0.875	2.095	BALCO Korba, NTPC Korba, Sipat, & Bhilai, KSK Bilaspur, GMR Kharora	75 Km to 175: Road and via closed system
4.	Sand stone	0.033	0.024	0.057	Local supplier	Road
5.	Iron Ore	0.066	0.048	0.114	Local supplier	Road

***Source**: Pre-feasibility Report*

c) Fuel Requirement

Details regarding quantity of fuel required, their source along with distance and mode of transportation are given below -

S. No.	Name of Fuel	Quantity Required (MTPA)			Calorific value (Kcal. /kg)	% Ash	Source	Distance & Mode of Transportation
		Existing	Additional	Total after expansion				
1.	Mix of Coal, Petcoke and Alternate Fuels	0.5967	0.432	1.0287	3000 to 8200	1% to 70%	**Coal:** SECL (Korba & Raigarh), Captive coal mine at Gare Palma. **Imported Coal:** USA, South Africa, Indonesia. **Petcoke:** Oil refineries. **Imported Petcoke:** USA, Saudi Arabia. **Alternate Fuel:** Local sources	175 to 1800 km Rail & Road

Source: Pre-Feasibility Report

***Note-** The hazardous waste / non-hazardous waste of the nearby industries i.e. MSW RDF, Solid Waste, Boiler Ash, Cloth Waste, FMCG Waste, Own Waste, Plastic Waste, Wooden Dust will be used for co processing in the Kiln as per the availability in the market.*

d) Basic requirement for the project

S. No.	Particular	Details			Source
		Existing	Additional for proposed expansion	Total after proposed expansion	
1.	Water (KLD)	6044	1500	7544	Bore well and Mine pits.

S. No.	Particular	Details			Source
		Existing	Additional for proposed expansion	Total after proposed expansion	
2.	Power (MW)	60	43	103	Chhattisgarh State Electricity Board (CSEB), WHRS & DG set (For back up).
3.	Manpower (No. of Persons)	1274	200	1474	Unskilled/semi-skilled manpower will be sourced from the local area and skilled manpower will be sourced from outside/local.

***Source**: Pre-feasibility Report*

iv) Process description in brief, specifically indicating the gaseous emission, liquid effluent and solid and hazardous wastes. Material balance shall be presented.

The Cement Plant is based on Dry Process Technology for Cement manufacturing with Pre-Heating and Pre-Calciner Technology. Company proposing an expansion of Integrated Cement Project (Clinker - 4.8 to 8.1 MTPA, Cement - 3.5 to 6.5 MTPA and WHRS - 18 to 43 MW) by installation of Line-III. The type of cement i.e. OPC and PPC will be manufactured. Major steps involved in the process of Cement manufacturing in the Cement Plant are given as below:

- Transport of excavated limestone from mine site
- Raw Mix Preparation & Homogenization
- Preheating and Calcination
- Clinker Cooling, Clinker Storage & Transport
- Cement Production Grinding of Clinker in Cement Mill
- Storage, Packing and Dispatch of Cement.

Waste Heat Recovery System

M/s. Ambuja Cements Ltd. is proposing for installation of additional Waste Heat Recovery System (WHRS) of 25 MW to utilise the waste gases from the Preheater and Cooler to generate electric power and consequently reduce consumption of power generated through Fossil Fuel. The project will contribute to more efficient use of energy and will reduce reliance on exhaustible fossil fuel.

In the cement plant, WHRS will consist of two waste heat recovery boilers viz.

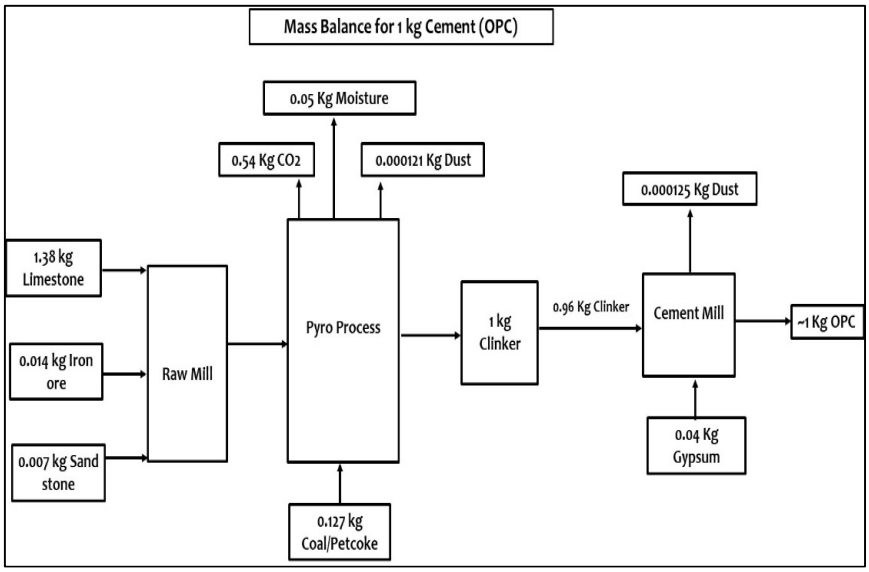
a) Pre-Heater (PH) boiler: PH boiler will be installed after Pre-Heater and recovers heat from Pre-Heater exhaust gases.
b) Clinker Cooler (AQC) boiler: Clinker cooler or Air Quenching Cooler (AQC) boiler will be installed after Clinker cooler and recovers heat from Clinker cooler exhaust gases.

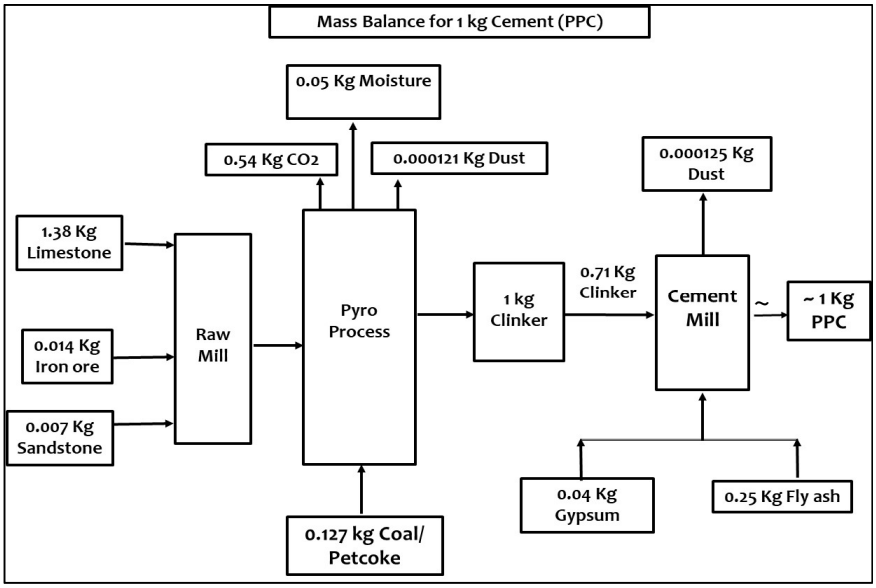
c) Gaseous emission, liquid effluent and solid and hazardous wastes

Particulars	Type	Source	Management
Emissions	PM, SO2, NOx	Cement Plant	o Efficient Air Pollution Control Equipment like RABH, Baghouse and ESP o Pyro-process itself acts as a long SO_2 scrubber o Low NOx burner and De NOx System o Incline Calciner for low NO_x formation. o Installation of analyzer at the inlet of Kiln to monitor O_2 & NO_x.
Fugitive Emission	SPM	Plant activities	o Covered Conveyor belts will be used for transfer of raw materials / finished products inside the plant. o Fly ash will be received through closed bulkers & fed into silo through pneumatic system. o Clinker, fly ash and Cement will be stored in the silos. o Gypsum, Coal and Petcoke will be stored in the covered sheds. o All the movement area will be concreted. o Vacuum sweeping will be used for better housekeeping. o Greenbelt / plantation will be done along the plant boundary to attenuate air pollution.
Process Waste Water	Waste water	RO Plant, CPP & WHRS	RO reject water 939 KLD & boiler blow down 444 KLD from CPP is being/will be used for dust suppression.
Domestic Waste water	Waste Water	Plant & Colony	Domestic wastewater generated 188 KLD from Plant & Colony is being/will be treated in the existing STP of capacity 2 x 25 m^3/day and 500 m^3/day and the treated water is being utilized for greenbelt development/ plantation. Sludge 22 kg/day generated from STP is being/will be used as manure in greenbelt development/ plantation.
Solid & Hazardous waste	Cement Dust	Cement Plant	Dust collected from various APCE will be totally recycled into the process.
	MSW	Plant & Colony	Bio-degradable waste will be composted and non-degradable wastes will be disposed off suitably.
	STP Sludge	STP	Is being/will be used as manure for greenbelt development / plantation
	Used or Spent Oil	Plant Maintenance	Is being/will be sold to CPCB authorized recycler / Processing in kiln
	Contaminated cotton rags		
	Empty barrels		
	Used Batteries	Different Sections	Is being/will be sold to CPCB registered recycler

d) Material balance

Mass Balance Diagram for manufacturing of OPC and PPC is shown below –





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

Particulars	Details
Air Quality Management	℘ Installation of Air Pollution Control Equipments i.e. RABH/Bag House ℘ Installation of bag filters has been/will be done at all transfer points to reduce fugitive dust emissions ℘ Storage of Clinker, Fly ash and Cement has been/will be done in silos ℘ Storage of limestone, Iron-Ore, Coal, Petcoke, and Gypsum has been/will be done in covered shed ℘ Enclosures has been/will be provided for unloading operations ℘ Water spray has been/will be carried out during unloading of materials. ℘ Water Spray on roads & other areas by mobile tanker/water sprinklers has been/will be carried out. ℘ All the Roads inside the plant premises have been concreted. ℘ Regular vacuum sweeping of all the roads & floors has been/will be done. ℘ Dust collected from air pollution control equipment have been/will be totally recycled in the process.

Particulars	Details
	ꕥ Fly ash has been/will be pumped directly from the tankers to silos pneumatically in closed loop or mechanically such that fugitive emissions do not occur. ꕥ Dry fly ash has been/will be transported into closed system. ꕥ Regular ambient air quality and stack emission monitoring is being/will be carried out as per CPCB norms to ensure that ambient air quality is met at all the time.
Water Management	ꕥ No waste water is being/will be generated from the Cement manufacturing process. ꕥ RO reject water 939 KLD & boiler blow down 444 KLD from CPP is being/will be used for dust suppression. ꕥ Domestic wastewater generated 188 KLD from Plant & Colony is being/will be treated in the existing STP of capacity 2 x 25 m^3/day and 500 m^3/day and the treated water is being utilized for greenbelt development/ plantation.
Noise Management	ꕥ Properly insulated enclosures have been/will be provided with equipment generating excessive noise. ꕥ Improved silencers have been/will be provided within the equipment generating high noise. ꕥ Installation of compressors and turbine in closed building have been/will be done. ꕥ Proper maintenance, oiling and greasing of machines will be done at regular intervals to reduce generation of noise. ꕥ Personal Protective Equipment (PPEs) like earplugs and earmuffs to the workers exposed to high noise level. ꕥ Development of Greenbelt of appropriate width inside the plant premises and at the plant boundary. ꕥ Regular monitoring of noise level and corrective measures accordingly.
Solid & Hazardous Waste Management	ꕥ Dust collected from various air pollution control equipment is being/will be recycled into the process. ꕥ Fly ash generated from CPP (450 TPD) is being utilized in manufacturing of PPC grade cement. ꕥ Refractory bricks lining in the kiln have high recycling values is being/will be disposed off to external vendors for their use in other industries. ꕥ Sewage sludge (22 kg/day) generated from STP is being/will be used as manure in greenbelt development/ plantation. ꕥ Solid waste (Dry - 0.07 Tonnes/annum and Wet - 0.030 Tonnes/annum) generated from Residential colony/canteen is being/will be disposed after segregating the waste into bio-degradable and non-degradable. Bio degradable waste is being/will be composted and non-degradable wastes shall be disposed off. ꕥ Small quantity of used oil and grease is being/will be generated, which will be sold to the CPCB authorized recyclers. ꕥ Used Oil (25 KL/annum), Used Grease/gear Grease, Transformer Oil, Tank bottom Sludge is being/will be generated as per Schedule I of Hazardous and Other Wastes (Management and Tran boundary Movement) Rules, 2016. Apart from these wastes various other wastes including hazardous wastes, shall be used in kiln as co processing depending upon availability & feasibility and obtaining requisite authorization under above rule.
Greenbelt Development / Plantation	ꕥ Out of the total project area i.e. 238.97 ha, 83 ha (i.e. 34.7 %) of total plant area has already been developed under greenbelt/plantation. Same will be maintained and enhanced in future. ꕥ At present, about 201484 saplings have been planted @2427 plants/ha in the plant area. Further, density of the plants will be increased up to 2500 plants per ha by gap filling with 6000 plants. ꕥ Greenbelt development has been done all along the road & plant boundary which will attenuate noise level, arrest dust & to increase aesthetic beauty of the area. ꕥ Native plant species like Neem, Peepal, Mango, Gulmohar, Babool, Ashok, etc. have been planted in project to achieve the targeted green belt development in consultation with the local community and District Forest Department.

vi) Capital cost of the project, estimated time of completion.

S. No.	Particular	Details
1.	Total Cost for the Project	Rs. 2000 Crores
2.	Cost for Environmental Protection Measures	Capital Cost - Rs. 100.0 Crores Recurring Cost: Rs. Rs. 1 Crores / annum
3.	Time of completion of the project	An implementation period of 28 months from the date of signing/ effectiveness of the main equipment supply contract is foreseen for this project for maintenance of the plant and installation of Cement Mill & Packing Plant

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

Total plant area is 238.97 ha. The expansion will be done by installation of line- III within the existing plant premises; which is Under Industrial Category.

b) Status of its acquisition

The expansion will be done by installation of line III within the existing plant premises; which is already under possession of M/s. Ambuja Cements Ltd. (Unit: Bhatapara).

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

S. No.	PARTICULARS	DETAILS *(with approximate aerial distance & direction from the nearest project boundary)*
1.	Nearest Town	Balodabazar (7.0 km in ESE direction)
2.	Nearest City	Raipur (65 km in SW direction)
3.	Nearest National / State Highway	NH - 200 (30 km in WNW direction) SH- 10 (adjacent to plant site in NE direction)
4.	Nearest Railway station	Bhatapara Railway Station (14 km in WNW direction)
5.	Nearest Airport	Raipur (63 km in SSW direction)
6.	National Parks, Wildlife Sanctuaries, Biosphere Reserves within 10 Km radius	No National Park, Wildlife Sanctuary, Biosphere Reserve, etc. exists within 10 km radius of the plant site.
7.	Protected Forests (PF) / Reserved Forests (RF) within 10 Km radius	○ Dhabadih RF (4.0 km in SSE direction) ○ Latwa RF (5.5 in ENE direction) ○ Sonbarsa RF (6.5 km in NE direction) ○ Mohtara RF (9.0 km in NE direction)
8.	Water Bodies within 10 km radius	○ Jamuniya Nadi (6.5 km in NW direction) ○ Banjari Nala (5.0 km in WNW direction) ○ Khorsi Nala (8.5 km in SE direction) ○ Kukurdih Talav (1.5 km in SE direction)

S. No.	PARTICULARS	DETAILS *(with approximate aerial distance & direction from the nearest project boundary)*
		o Kukurdih - Dharamshala Canal (4.0 in SE direction) o Mahanadi Canal (Adjacent in SE direction) o Chitawar Nala (8.5 in South direction)
9.	Seismic Zone	Zone - II [as per IS 1893 (Part-I) :2002]

d) List of industries within 10 km radius study area

S. No.	Name of the Industry	Type of Industry	Approx. Distance and direction from plant site
1.	M/s Ambuja Cements Ltd. (Maldi Mopar Mines)	Mining Industry	~1.50 km in SW direction
2.	M/s Emami Cements Ltd. (Limestone mine)	Mining Industry	~3.5 km in SE direction
3.	M/s Emami Cements Ltd.	Cement Industry	~4.5 km in SE direction
4.	M/s Shree Cements Ltd.	Cement Industry	~7.5 km in SW direction
5.	M/s Shree Cements Ltd. (Limestone mine)	Mining Industry	~5.5 km in SSW direction
6.	Village Suhela, Stone crusher	Stone crusher	~11.0 km in SSW direction
7.	Village Suhela, Small Brick Kiln	Brick Industry	~11.0 km in SSW direction
8.	Village Jhipan, Small Brick Kiln	Brick Industry	~10.5 km in WSW direction
9.	M/s UltraTech Cements Ltd. Limestone mine, Rawan, Jhipan	Mining Industry	~11.0 km in SW direction
10	M/s UltraTech Cements Ltd.	Cement Industry	~11.5 km in SW direction
11.	Others: Some stone Crushers, Mine Quarries etc. also exist within the study area		

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 Summer Season (Mar., to May., 2021). Ambient air quality monitoring has been carried out at 14 locations in the study area on 24 hourly bases. The concentration of PM2.5 ranges between 27.0 to 56.4 µg/m3, PM10 ranges between 54.2 to 94.6 µg/m3, SO_2 ranges between of 5.97 to 13.02 µg/m^3 and NO_2 ranges between 12.88 to 30.65 µg/m^3. The Concentration of CO were found to be in range of BDL to 0.93 mg/m^3.

Ambient noise levels were measured at 12 locations around project site. Noise levels vary from 51.3 Leq dB (A) to 63.4 Leq dB (A) during day time and from 41.9 Leq dB (A) to 51.8 Leq dB (A) during night time. Within the 10 km radius of study area the noise levels at the sampling locations are under the CPCB prescribed limits.

The ground water analysis for all the 13-sampling location shows that pH varies from 6.67 to 7.52. Total hardness varies from 153.0 to 877.2 mg/l. Total dissolved solids varies from 284 to 1104 mg/l.

Total 7 surface water bodies are present within 10 km radius of the plant site. Surface water samples were collected from two locations i.e. Kukurdih Talav and Mahanadi Canal and rest of the water bodies

were found dry during the study period. The pH of the water bodies ranged from 7.14 to 7.65. Total hardness varies from 78.45 to 95.78 mg/l. Total dissolved solids varies from 213 to 268 mg/l.

Soil monitoring was carried out at 13 locations and the analysis results show that soil is slightly acidic to moderately alkaline in nature; pH value ranging from 6.84 to 7.54 with organic matter from 0.63% to 1.45%. Soil texture is silty loam and sandy loam. Available nitrogen ranges from 99.93 kg/ha to 138.15 kg/ha. Phosphorous ranges from 33.58 kg/ha to 53.47 kg/ha whereas the Potassium ranges from 154.28 kg/ha to 248.25 kg/ha.

b) Biological Environment (Flora & Fauna)

Flora: Total of 54 trees, 13 shrubs, 7 herbs 4 species of grasses, 5 Aquatic species and 8 species of climbers were recorded based on primary observation as well as based on information collected from the secondary data. Most common species found in the area are *Acacia nilotica* (Babul), *Acacia senegal (*Kumta), *Albizia lebbeck (*Siris tree), *Azadirachta indica (*Neem), *Bauhinia racemosa (*Katmauli), *Butea monosperma (*Palash), *Cassia fistula (*Amaltas), *Cassia siamea (*Kassod), *Dalbergia sissoo (*Shisham), *Delonix regia (*Gulmohar), *Eucalyptus globulus (*Safeda), *Mangifera indica (*Mango/Aam), *Calotropis procera (*Aak) etc. However, during the field survey and List of Flora by ENVIS, MoEFCC; no endemic, endangered and rare species of flora have been observed under threatened status in the study area.

Fauna: Among fauna, 15 species of mammals, 10 species of Herpeto-fauna (reptiles and amphibians) and 4 species of Butterfly and 3 species Arthropods were recorded from the study area. Commonly found species in the study area are *Funambulus pennanti (*Northern Palm Squirrel), *Presbytes entellus (*Common Langur), *Rattus rattus (*Domestic Rat), *Calotes versicolor (Common* Garden Lizard), *Duttaphrynus melanostictus (*Common Indian toad), *Acridotheres tristis (*Common Myna), *Egretta garzetta (*Little Egret) *etc.*

Among avifauna, 40 species were recorded in the study area. 2 schedule - I species i.e. Monitor lizard (Varanus bengalensis) and Python (Python molurus) were recorded in the study area during field survey; which are categorized as Schedule - I according to (IWPA) Indian Wildlife Protection Act' 1972.

c) Socio-Economic Environment

The population as per 2011 Census records is 92548 (for 10 km radius). Total no. of household is 3518, 7567 and 7137 respectively, in primary, secondary and outer zone. Sex ratio is 987, 1101 and 1004 (females per 1000 males) observed in primary, secondary, tertiary and outer zone respectively. SC population distribution is 2984, 9119 and 7995 respectively in primary, secondary and outer zone. ST population distribution is 4205, 7398 and 8672 respectively in primary, secondary and outer zone respectively. Total No. of villages observed within the 10 km radius from the project area are 68. Percentage of total working population and non-working population is 47% and 52.9% respectively in the surveyed villages.

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 impact	Mitigation Measures
1.	Storage & handling of raw material & chemicals	Heat, Fire& dust	Exposure, physical injuries, burning, air pollution due to fugitive emissions	• Use of PPEs. • Continuous water sprinkling • Training to workers for proper handling • Proper system for loading & unloading operations • Firefighting & first aid facility. • Storage should be away from ignition source • Proper housekeeping facilities
2.	Working in Cement Plant	Heat, Fire, Dust, Smoke & Explosion	Physical injuries, burning, air pollution, CO poisoning	• Firefighting& first aid facility • Use of PPEs. • Use of proper APCDs like Bag house ESP/Bag Filters • Inspection & regular monitoring • Training to workers for proper handling of raw materials
3.	APCD failure	Release of PM in ambient air	Air pollution	• Regular monitoring & inspection is being/will be done. • The plant shall immediately shut down on APCD failure
4.	Working at height	Slip, trips & falls of operators	Physical injuries	• Individual alertness of the workers. • First aid boxes shall be provided
5.	Electrical maintenance work	Electric shock, short circuits in power room	Electrical shocks, Injury or burn	• Regular checking and maintenance of electrical units • Use of PPEs • Provision of First aid box
6.	Working near D.G. sets during emergency	High noise	Noise induced hearing losses	• Provision of PPEs to the workers.

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 Limestone and other raw materials by road	Fugitive Dust Emission& Gaseous Pollutants	▪ Increase in the fugitive dust concentration in the ambient air which will affect the biotic environment	• Use of PUC Certified vehicles • Vehicles to be covered with tarpaulin and not over loaded. • Speed limit to be maintained (10 km /hr) • Paved road in plant premises

S. No.	Project Activity	Aspect	Impact	Mitigation Measures
2.	Material storage and handling		▪ Increase in the fugitive dust concentration in the ambient air ▪ Workers affected by respiratory diseases due to working in the high dust-zone area	• Covered sheds for storage of Gypsum, Coal & Petcoke • Personal Protective Equipment to the workers
3.	Raw Mix Preparation	Particulate Matter Emission	Increase in the concentration of particulate matter in the ambient air	• Transportation of the material to the raw mill by covered conveyor belt • Installation of Bag Filters at transfer points (Total 153 Nos in all Lines)
4.	Clinkerization (Calcination)	Particulate Matter Emission, Gaseous Emission & Fugitive Dust Emission	Increase in Particulate Matter, SO_2 & NO_2 and fugitive dust concentration in air environment	• Installation of adequate APCEs such as Bag House & ESP. • Low NO_x burners& De NOx System • Greenbelt / plantation (83 ha) has already been developed. • Personal Protective Equipment (Goggles, Mask etc.) to workers
5.	Clinker Grinding / Cement Mill (including Fly ash handling)	Particulate Matter Emission & Fugitive Dust Emission	Increase in Particulate Matter and fugitive dust concentration in air environment	• Installation of Bag House • Fly ash received through closed bulkers & fed into Silo through pneumatic system. • Development of greenbelt / plantation.
		Noise generation due to Exhaust fans and Cement grinding	▪ Increase in noise levels near source generation ▪ Hearing impairments ▪ Other health effects	• Earmuffs/ Earplugs to persons working in high noise zone. • Proper lubrication & maintenance of machinery • Development of greenbelt / plantation within the plant premises • Periodic Occupational Health Surveillance of worker
6.	Cement Packing & Dispatch	Fugitive Dust Emission	▪ Area source - Increase in fugitive dust concentration in air environment ▪ Respiratory Diseases	• Dust extraction arrangement • Spilled cement collected and recycled • Installation of Bag Filters at transfer points • Development of greenbelt • Personal Protective Equipment (Goggles, Mask etc.) to worker. • Periodic Occupational Health Surveillance
7.	Coal handling	Fugitive Dust Emission	Increase in fugitive dust concentration in air environment	• Dust extraction arrangement • Installation of Bag Filters at transfer points • Development of greenbelt

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

M/s. Ambuja Cements Limited (Unit: Bhatapara) has/will have an Emergency Plan (Onsite & offsite) at the plant site. Suitable Risk Control Measures with respect to Risk Assessment is being/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 OM dated 30th Sept., 2020 & OM dated 20th 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

Dust	▪ Implementation of adequate dust control systems and good housekeeping. ▪ Water sprinkling in the places where dust dispersion can occur. ▪ Regular sweeping of roads within plant premises ▪ Providing dust masks to employees working in handling and storage yards. ▪ Periodic work zone monitoring
Noise	▪ Proper maintenance of machineries ▪ Installation of compressors in closed buildings ▪ Regular monitoring of noise level ▪ Display of noise level with permission level ▪ Display instructions for using PPEs at high noise level area ▪ Periodic health checkup for Audiometry for the individuals working in high noise area
Heat stress	▪ Scheduling hot jobs in cooler part of the day ▪ Monitor those workers who are at risk of heat stress ▪ Provide rest periods with water breaks ▪ Use of personal protective equipment
Electrical Hazards	▪ Proper Earthing as per IS 3043 will be done ▪ Low Voltage Supply will be ensured ▪ Isolating Transformers ▪ Double Insulated Tools ▪ Over Load Protection ▪ Protection Against Leakages (G.F.C.I.) ▪ Flame- Proof Equipment ▪ Lightning Protection ▪ Protection against Static Electricity and safely using ladders and scaffolds
Fire and Explosion	▪ Suitable fire extinguisher, fire buckets and fire hydrant system. Dry power type in oil and fire buckets is being/will be kept near transformer, cable, general store and office area. Hydrant line

	at all location in plant area along with coal, clinker storage area. Fire tender is to be kept ready at plant main gate. ▪ Oil and Flammable Gases storage area is being/will be fenced and declared as Fire Hazardous Area-No Smoking Area" ▪ Permit and safety instruction is being/will be given to use welding / gas cutting in the area of oil, gas, coal and bag go down. ▪ Predictive interlock in transformers so as to give alarm and trip the system. ▪ Adequate height of brick walls for separation of all transformers, soak pits for storage of oil leakages from transformers is being/will be done.
Other Hazards	▪ Structural soundness of silos and buildings. ▪ Installing light arrestors at all tall buildings. ▪ Permit to be taken to work at height with work instruction to use safety belts etc. ▪ Testing of all lifting tools, tackles and pressure vessel to avoid failure. ▪ Safe working pressure maintained in air receiver. ▪ Safe working load on cranes and ropes etc. ▪ Good housekeeping & Speed limit of vehicles will be 20 km/hr. inside the proposed plant area. ▪ Display of emergency number at all suitable location. ▪ Fire tender, ambulance and emergency staff ready at the plant main gate at all the time ▪ First aid kits are kept at the sites and training provided ▪ Use of mobile while driving, alcohol, smoking etc. are ban inside the proposed plant area. ▪ Proper illumination in plant area (100 to 150 LUX), office (250 to 300 LUX) and road area (20 to 30 LUX)

xv) Post project monitoring plan

Frequency and location for post-project monitoring

S. No.	Description	Frequency of Monitoring	Location
1.	Meteorological Data	Hourly	Plant Site
2.	Ambient Air Quality	Twice a week / Yearly/ online Monitoring	Plant Boundary in upwind & downwind direction and as per EC / CTO conditions
3.	Fugitive Emission	Quarterly	Cement Mill, Packing Plant, Raw Materials Handling Area & Coal Yard
4.	Stack Monitoring	Monthly/ Yearly & Continuous Online Monitoring	Raw Mill & Kiln, Coal Mill, Clinker Cooler & Cement Mill
5.	Stack Monitoring (AFR)	Once in a year	Raw Mill / Kiln
6.	Water level & Quality	Twice in a year & as per EC / CTO	Nearby Ground water sources and as per CGWA NOC
7.	Waste water Monitoring	Monthly & as per CTO	Inlet and outlet of STP
8.	Noise Level Monitoring	Monthly & as per EC / CTO	Plant Boundary, High noise generating areas within the Project Boundary and as per CTO conditions
9.	Medical Checkup of Employee	Yearly or as per Factories Act	Health Management Centre
10.	Performance evaluation of APCE's / Adequacy Study	Once in three year	Raw Mill / Kiln Bag house, Coal Mill Bag House, Cement Mill Bag House and Clinker Cooler ESP