### ANNUAL ENVIRONMENTAL STATEMENT Page 1 of 20

#### 2016-2017

#### FORM-"V" (See Rule 14)

#### Environmental Statement for the Financial Year Ending on 31<sup>st</sup> March 2017

#### PART A

I	Name & Address of the Owner/Occupier of the Industry	:	Shri. Rajesh C. Kothari Ambuja Cement Ltd., P.O.: Rawan, Tehsil: Baloda Bazar Dist.: Baloda Bazar-Bhatapara-493331 (CG) Phone : 07727-220014 FAX no. : 07727-220004
II	Industry Category Primary- (STC Code) Secondary (STC Code)	:	Red
ш	Production Capacity	:	Cement Plant – <b>3.5 MTPA</b> Limestone – <b>6.31 MTPA</b> , Captive Thermal Power Plant - <b>63 MW</b> (15MW + 15 MW+ 33MW) DG - <b>4 MW</b>
IV	Year of establishment	:	Cement Plant – 1985 Captive Limestone – 1984 Thermal Power Plant- 2003 DG Set- 1992
V	Date of last Environmental Statement submitted	:	10/09/2016, Ref: ACL/ES/2016/107

#### PART B

#### Water and Raw Material Consumption

### I. <u>Water Consumption m<sup>3</sup>/day</u>

S NO	Description	During Previous Financial Vear	During current
5.110.	Description	2015-2016	2017
1.	Process +Cooling (m <sup>3</sup> /day)	4452*	4673 <sup>*</sup>
2.	Domestic (Colony + Canteen +	367***	300***
	Sanitation) (m <sup>3</sup> /day)	507	500
3.	Other(Dust Suppression +	200 0**	119 7**
	Plantation) (m <sup>3</sup> /day)	200.9	110.7

\* Process cooling includes Cement plant, Captive Power Plant & DG.

\*\* TPP & Sewage treated water is using for Dust Suppression & Plantation.

\*\*\*Domestic (Colony + Canteen + Sanitation) includes bore well & RWH.

### ANNUAL ENVIRONMENTAL STATEMENT Page 2 of 20

### 2016-2017

Total Water Consumption per unit of Product output				
Name of the productDuring the previous financial Year 2015-2016During the current financial Year 2016-2017				
Cement	0.78 KL/T Cement	0.77 KL/ T Cement		

• Note: This is total water consumption

#### II. <u>Raw Material Consumption</u>

Name of the Name of		Consumption of raw material per unit of output			
raw materials	product				
		During the previous	During the current financial		
		financial year 2015-2016	year 2016-2017		
Lime Stone	Clinker	1.514 T/T of Clinker	1.486 T/T of Clinker		
Gypsum	Cement	0.034 T/T of Cement	0.031 T/T of Cement		
Iron Ore	Cement	0.009 T/T of Cement	0.014 T/T of Cement		
Fly ash	Cement	0.2809 T/T of Cement	0.275 T/T of Cement		
	Clinker	0.1503 T/T of Clinker	0.1446 T/T of Clinker		
Coal	TPP	0.001	0.001		
	(ton/KWH)				
Explosives					
(	Lime Stone	0.176	0.207		
kg of explosive					
Ton of L/s					
raised/)					

### ANNUAL ENVIRONMENTAL STATEMENT Page 3 of 20

#### 2016– 2017

#### <u>PART – C</u>

(1) Pollutants	Quantity of pollutants Discharged (Mass/day)	Concentration of pollutants in the discharge (mass/volume)	Percentage of variation from prescribed standards with reasons
<ul> <li>(a) Water</li> <li>&gt; Industrial process</li> <li>&gt; Dust suppression</li> <li>&gt; Plantation</li> <li>&gt; Canteen Waste water</li> <li>&gt; Sanitary Waste water</li> <li>&gt; Colony Waste water</li> </ul>	Nil Nil Nil 5.0 Kl/day Nil Note: Total colony waste water is treated in Sewage Water Reclamation Plant for recycling and reused for gardening in colony, Guest House, Temple and Quarters.	- - - - - - - - - - - - - - - - - - -	- - - - Within Permissible limit
<ul> <li>(b) AIF</li> <li>From Stack</li> <li>Raw mill &amp; kiln stack line-1</li> <li>Cooler Stack line-1</li> <li>Cement Mill stack 01</li> <li>Cement Mill stack 02</li> <li>Cement Mill stack 03</li> <li>Cement Mill VRPM</li> </ul>	0.1266 Ton/day 0.1219 Ton/day 0.008 Ton/day 0.016 Ton/day 0.006 Ton/day 0.037 Ton/day	18.73 mg/Nm <sup>3</sup> (avg.) 20.3 mg/Nm <sup>3</sup> (avg.) 25.87 mg/Nm <sup>3</sup> (avg.) 18.16 mg/Nm <sup>3</sup> (avg.) 19.46 mg/Nm <sup>3</sup> (avg.) 18.81 mg/Nm <sup>3</sup> (avg.)	Within Permissible
<ul> <li>Coal Mill Stack line-</li> <li>Crusher Stack line-1</li> </ul>	0.008 Ton/day	23.24 mg/Nm <sup>3</sup> (avg.) 18.56 mg/Nm <sup>3</sup> (avg.)	

### **Pollution Discharged To Environment / Unit of Output**

### ANNUAL ENVIRONMENTAL STATEMENT Page 4 of 20

#### 2016– 2017

DG stack (4MW)	-	-	
TPP stack 15 MW	0.036 Ton/day	$33.97 \text{ mg/Nm}^3$ (avg.)	
(old)			
Raw Mill & kiln			
stack line-2	0.38 Ton/day	15.35 mg/Nm <sup>3</sup> (avg.)	
Cooler Stack line-2	0.259 Ton/day	21.22 mg/Nm <sup>3</sup> (avg.)	
Coal Mill Stack line-	0.12 Ton/day	$21.63 \text{ mg/Nm}^3 (avg.)$	
2			
Crusher Stack line-2	0.035 Ton/day	$21.24 \text{ mg/Nm}^3$ (avg.)	
TPP stack 15 MW	0.5139 Ton/day	$37.13 \text{ mg/Nm}^3$ (avg.)	
(new)	•		
TPP stack 33 MW	0.3734 Ton/day	$36.7 \text{ mg/Nm}^3$ (avg.)	
	-		

Location	<b>PM-10</b> (μg/m <sup>3</sup> )	PM-2.5 (μg/m <sup>3</sup> )	$\frac{SO2}{(\mu g/m^3)}$	$\frac{NO2}{(\mu g/m^3)}$	CO (mg/m <sup>3</sup> )	
Plant Location	56.93	26.15	8.88	12.68		
Mines Location	62.04	26.99	7.68	14.74		
Residential Colony	61.24	28.24	7.48	14.05	BDL	Within Permissible Limit
Khairtal Village	62.63	28.94	8.03	13.95		
Kukurdih Village	63.08	29.94	7.96	16.19		

#### PART-D

#### **Hazardous Wastes**

As specified under the Hazardous Waste (Management, Handling and Transboundary), Rules 2016

Hazardous Wastes	Total Quantity				
	During the previous Financial year	During the Current Financial Year			
(i) From process					
Used/Spent Oil	37.376 MT	46.109 MT			
> Waste/Residue	18.304 MT	16.951 MT			
containing Oil					
(ii) From Pollution Control	Not Applicable	Not Applicable			
facilities					

### ANNUAL ENVIRONMENTAL STATEMENT Page 5 of 20

#### 2016– 2017

#### PART-E

#### Solid Wastes

Wastes	Total Quantity			
	<b>During The Previous</b>	<b>During The Current</b>		
	Financial Year.	<b>Financial Year</b>		
(a) From process				
Over burden in Mines	694696 MT	14,49,197 MT		
Screen Reject material	108076 MT	79,872 MT		
(b) From Pollution Control				
facilities	Not Applicable	Not Applicable		
(c)				
(1) Quantity recycled	Refer Note	Refer Note		
(2) Sold				
(3) Disposal				

#### Note:

**Overburden** material and the intercalated limestone, which gets thoroughly mixed upon blasting and from which recovery of usable limestone is very less or uneconomical is separately dumped at the overburden dump-yard but if there is proportionately more limestone that can be recovered, then it is subjected to screen and limestone is recovered. The overburden material generated during the process of stripping etc is loaded into Dumpers which carries it to the dump. These are regularly spread out with the help of Dozers and more room is created for accommodating additional overburden.

**Topsoil** is separately scrapped with the help of Dozer. It is carried to a separate topsoil dump and temporarily stored to be utilised in social afforestation and horticulture. There is an effort to utilise the topsoil to the maximum possible extent. These will be utilised for future reclamation of the abandoned pit. Top Soil exists over the Limestone at isolated places intermixed with clay/ murrum. The soil cover wherever encountered, is removed separately and utilized for plantation and horticultural work in and around the mining lease as well as plant premises. Therefore permanent storage or preservation of soil is not envisaged however the soil is temporarily stacked in the lease area prior to its utilization for plantation / horticultural works.27300 MT is used in 2016-2017.

**Screen Reject**: In 1998, IBM carried out Bench Scale Beneficiation Studies on Limestone from Rawan Limestone mines. The results of the beneficiation study were discussed and incorporated in the approved Mining Plan. Based on these studies, a screening plant was installed at the mine.

### ANNUAL ENVIRONMENTAL STATEMENT Page 6 of 20

#### 2016-2017

Material from first bench containing interstitial soil with clay and murrum is passed through the screening plant along with contaminated stock to recover the good grade limestone. The screening plant is facilitating in higher recovery of limestone from the first bench comprising substantial waste rocks. The screening plant comprises a wobbler and screen which help to improve the limestone quality and to further reduce the waste. The process is summarized below: +80 mm material passes through wobbler and fed to the downstream crusher.-80 mm material passes through the gap in the wobblers bed directly on to a downstream belt conveyor and goes to the screening plant- 10 mm material is waste and hauled to the waste dump yard as screen reject

#### PART G

#### **Impact of the Pollution Abatement Measures**

**M/s Ambuja Cements Limited** is committed for **Environment Excellence** through environmental friendly activities. Company wishes to conserve the Environment as well as to reduce the production cost by minimizing the waste and by optimizing the process. Efforts for achieving the above said goals and for minimizing the adverse effect on environment along with economic growth are as follows:

• Installation of Pollution Control Equipments: Efficient and modern state of art pollution control equipment (Glass Bag House Filter, GBH) is being attached to every stack so that the gases emitted to the surrounding atmosphere has components below/as per pollution board norms and do not cause harm to any living being in the surrounding. Company has taken routine maintenance of this equipment at the top priority for their optimum performance. In Cement Mill No. 1, Cement Mill No. 2 ESP's converted to Hybrid-Filters. Apart from GBH, Power Plant Stacks and Cooler is equipped with Electrostatic Precipitator as pollution control equipment.



• Pollution Control Device ESP replaced by Pulse Jet Bag House at line-1 Kiln and Raw Mill to

### ANNUAL ENVIRONMENTAL STATEMENT Page 7 of 20

#### 2016-2017

sustain the emission level. At line-1 Raw Mill two fan system converted into three fan system for reduction in electrical energy consumption.



- Adequate initiatives have been taken for effective fugitive dust suppression like Dust Sweeping machine and water sprinkling on roads.
- Intensive **House-keeping** has been maintained by M/s ACL to minimize any spillage, from which fugitive dust emission is usually generated. In this regard ACL has made **pucca road** in most of the approach roads inside the plant & mines the remaining roads will be made pucca according to the action plan

### ANNUAL ENVIRONMENTAL STATEMENT Page 8 of 20

2016-2017



#### **Concreted Road & Road Sweeping Machines**



#### **Mobile Water Sprinkler**

• Water Management: No waste water is being/will be generated from cement manufacturing process, as it is based on dry process technology. Waste water generated from CPP is being recycled back to the process and used for dust suppression after proper neutralization. Domestic waste water generated from the colony is being treated in Sewage Water Reclamation Plant (SWRP) and treated water is being used for green belt development. The treated water is then fully utilized in gardens, lawns, vegetable & Fruit gardens in the colony. Rain water harvesting is being done at plant and colony area. Regular monitoring of water is being carried out.



**Sewage Treatment Plant** 

- Noise Management: To avoid any unwanted noise pollution, Ms ACL has adopted the practice of well ventilation system and proper maintenance of noise barriers. Apart from this all noisy areas within the plant and mines have been identified and caution boards are displayed for general awareness further nobody is allowed to enter in the noisy areas without ear muff / ear plug. Walls & buildings are being lined with sound absorbing materials. Proper maintenance and oiling/greasing done to reduce noise from equipments. Regular monitoring of noise is being carried out and corrective measures are being adapted to possible extent.
- M/s ACL has adopted special systems like VFD drive for energy conservation.

### ANNUAL ENVIRONMENTAL STATEMENT Page 9 of 20

#### 2016-2017

• **Storage Facility** :To control the dust emission effectively, M/s ACL stores the process materials and end products in concrete silos, coal in coal dome and gypsum in covered sheds with concrete floor. Clinker produced is being stored in clinker silo and also stored in a closed clinker shaft area thereby to reduce the fugitive emission.



Fully Covered Clinker Stock Pile



#### Fully Covered Coal Dome

- In its endeavor to remain environment friendly, M/s ACL has made dedicated efforts for developing **Green-Belt.** This plantation not only meant for its aesthetic value but it also serves as an effective carbon- dioxide sink. 79.65 Ha is covered with Green Belt out of 238.97 Ha area in the plant area which is more than 33% of Plant Area.
- **Routine monitoring / measurement** of fugitive emission, stack emission is done and water quality is tested on regular basis to evaluate the performance and for taking needful action.
- In the process of limestone mining from the quarries, different types of waste viz. Overburden /Top soil and screen rejects are produced. These are systematically dumped at prescribed stockpiles thereby preventing air borne dust to spread. Significant amount of these wastes are efficiently used for construction/repairing road, civil construction, and other development/protection work at Mines and Factory. The dumps are covered with coir mats to avoid fugitive emission, soil erosion and trees are also planted there.
- Washing Bay at Mines for washing Heavy vehicles: The oil water separator is specially designed to separate sludge & oil from dirty water. This system is controlled by electronic water level controller with level probes dipped in water. This is the "Skidi" of the W100 series of water recycling system by DUSTSOL Wash System.

### ANNUAL ENVIRONMENTAL STATEMENT Page 10 of

20

2016-2017





#### **Screen Dump Coco Fibre Mating Extension**





Protective Measures on Waste Dump : Garland Drain and Proper Plantation along the dump

# ANNUAL ENVIRONMENTAL STATEMENT Page 11 of 20

#### 2016– 2017





Washing Bay System at Mines

• M/s ACL installed **Solar Water heater** in Colony and Guest House



#### Installation of Solar Water Heater in the Colony and Guest House

• M/s ACL initiates its activities of community development in its vicinity to improve quality of life of its neighbors for sustainable development through facilitating drinking water in villages, arranging religious activities in surrounding villages, facilitating health care/ medical treatment educational assistance to Govt. schools in nearby villages, initiating welfare activities like farmers conference, training in tailoring, vehicle driving, domestic electrification etc.

# ANNUAL ENVIRONMENTAL STATEMENT Page 12 of 20

#### 2016-2017

• Solid & Hazardous Waste Management: No solid waste is being generated from the process. Dust collected is being recycled back in the process of cement manufacturing. Fly-ash from Power Plant is being used to generate PPC grade cement and coarse ash is being used as raw material for Raw Meal and construction of internal roads. Sludge generated from STP is being used as a manure for gardening. Used oil & Grease generated from machines is being sold to SPCB authorized recycler.



### ANNUAL ENVIRONMENTAL STATEMENT Page 13 of

20

2016-2017





**Green-belt & Plantation Development** 



House-keeping Initiatives for a Cleaner Plant

### ANNUAL ENVIRONMENTAL STATEMENT Page 14 of

20

#### 2016-2017

#### <u>PART – H</u>

#### **Additional Measures / Investment Proposal**

The Corporate Philosophy of AMBUJA CEMENTS LIMITED is to develop and grow along with considering the interests of employees and community at large. Hence the company always gives highest priority to the quality of environment in its vicinity. For serving the aforesaid purpose, the company has taken serious efforts for upgradation of the surrounding environmental condition. The Company's dedicated efforts have been awarded by DNV for ISO 14001 certificate. Not only this, the company constantly initiates and organises in-house as well as external training programmes to enhance the knowledge among employees for better up keeping the plant equipment and pollution control. Environment cell of ACL is constantly engaged in developing environmental awareness among employees, families & school going children, to build a strong structure of environmental consciousness.

![](_page_13_Picture_7.jpeg)

Awareness Session, Rally & Plantation Programme

# ANNUAL ENVIRONMENTAL STATEMENT Page 15 of 20

#### 2016-2017

- Oil and Water separation system, installed in mines workshop to separate the oil from water before discharge, is running successfully.
- Installed / Modified Water Spraying system for effective dust suppression in many areas .
- Installed continuous dust measurement equipment in the raw mill stack, coal mill stack, cooler stack and TPP Stack.
- Installation of a dome in open clinker stockpile area to arrest fugitive emission.
- Installation of Continuous Ambient Air Quality Monitoring Station( CAAQMS) in plant.
- Continuous Emission Monitoring System (CEMS) installed in Raw mill/ Kiln Stack of both lines.
- Air Cooled Condenser installed in Thermal Power Plant to save water.

![](_page_14_Picture_10.jpeg)

![](_page_14_Picture_11.jpeg)

CAAQMS & CEMS System

- **Reverse Osmosis (RO)** plant installed at Power plant treats waste water generated from De-Mineralization resin washing waste water and other waste water to be reused in the cooling tower. Thus, no waste water discharged to any water body outside plant premises.
- Installation of **Solar Power Plant** : We have installed 3 \* 100 KWP Solar Power Plant at our captive Power Plant. The power generated from Solar Plant is being used in self-auxiliary consumption.

#### ANNUAL ENVIRONMENTAL STATEMENT Page 16 of

20

#### 2016-2017

![](_page_15_Picture_4.jpeg)

![](_page_15_Picture_5.jpeg)

#### Solar Power Plant

M/s ACL had ensured zero discharge of water from the colony via Sewage Water Reclamation Plant (SWRP), where all the sewage water generated is efficiently treated and is fully utilised in gardening and other related activities.

Considering the importance of Rain water harvesting, M/s ACL has taken so many steps to trap the natural rain water. In this regard the company has adopted the following measures:

- Adopted roof rain water harvesting in colony.
- The company has widened the existing reclaimer pit for collecting natural water.
- A natural reservoir has been made in mines to collect rainwater, which is used for the Plant process throughout the year.
- A natural reservoir is being made at the west side of the Plant to collect 7 Lac  $m^3$  of • water.

![](_page_15_Picture_13.jpeg)

**Rain Water Harvesting – Mines Pit** 

![](_page_15_Picture_15.jpeg)

**Rain Water Harvesting – Reclaimer pit** 

# ANNUAL ENVIRONMENTAL STATEMENT Page 17 of 20

#### 2016-2017

#### **Initiatives by Ambuja Cements Foundation**

- Water Resource Management and Drinking Water : Pond Deepening, Drinking water pipe line for schools, Installation of Hand Pump, Solar Based drinking water
- Rural Infrastructure Development : Construction of Road, Construction of PDS Building, Pond Beautification
- Agro based Livelihood and Allied Activities: Farmer's training, Seed drill support, Training of extension workers, Organizing Farmer's field Day, Critical input and technology support for Wheat cultivation, Critical input and technology support for Vegetable cultivation
- Health and sanitation : Health Camps, Health Awareness Camp, Anemea Detection camp, Medicine for Anemeia Patients, Construction and repair of toilet, Construction of soak pits
- Education Development : Balmitra, Bus facility for school children, Support to schools and Anganwadi centers
- Women Empowerment and Development : Training of SHGs, Bank loan of SHG, Inter loaning activity

### ANNUAL ENVIRONMENTAL STATEMENT Page 18 of

20

2016-2017

![](_page_17_Picture_4.jpeg)

![](_page_17_Picture_5.jpeg)

Water Resource Management

![](_page_17_Picture_7.jpeg)

![](_page_17_Picture_8.jpeg)

**Community Health & Sanitation** 

### ANNUAL ENVIRONMENTAL STATEMENT P

Page 19 of 20

#### 2016-2017

#### <u>PART - I</u>

#### Particular/s For Improving The Quality Of the Environment

In a short span of the existence of the "AMBUJA GROUP", company has become one of the best performers in the cement industry through its innovative style of management and importance to total quality excellence. This has been achieved through team spirit of dedicated professionals from different disciplines of the organization and the "I can" philosophy, which encourages the personal mission of the individuals, rather than chasing fixed targets. Cement, Energy and Environment has been featuring success stories of "AMBUJA GROUP" in the fields of Energy conservation as well as Environmental improvement from time to time since the beginning of its journey. Company is following the norms fixed by the ISO 9001 to maintain continuous high quality for the customer satisfaction and to serve the Nation. The Company's dedicated efforts have been awarded by DNV for ISO 14001 certificates. In its endeavor to remain environment friendly, M/s Ambuja Cements Limited has adopted multi measures which include process and product modifications that consume less thermal energy and consequently cause lower CO<sub>2</sub> emission. Company has adopted waste heat recovery system to conserve significant amount of fuel and energy conservation by several modifications and installation of substitute equipment. The industry is also using gypsum, a waste product of another industry. Management is also interested for manufacturing more Blended Cement, which will really create positive impact on Environment. Though water pollution is not playing a vital role as playing in other chemical industry but M/s Ambuja Cements Limited conserve the water by re-utilizing the treated sewage water through Sewage Water Reclamation Plant.

Company stresses on pollution control through environment friendly activity because it believes on Green Productivity. Management deeply feels that it must have both immediate as well as long term benefits. The benefits acquire to producers as well as consumers and include increased efficiency gains in resource use, lower cost of production decreased cost of waste treatment and disposal. It will lower its operational and environmental compliance cost and it can reduce long term liability and clean up cost. Employees are benefited because it improves health and safety in the work place, ultimately it increases productivity growth rate.

Environment Cell is responsible for routine monitoring / measurement of various parameters like air, noise, water in Plant, Lime Stone Mines, Colony and give feed back to concerned departments for preventive and corrective measures for better environment, co-ordination with various departments for effective implementation of pollution control norms to ensure the regulatory compliance, environmental awareness and co-ordination with external agencies on environmental affairs. Management is very keen to improve the environment quality both in micro and macro level.

### ANNUAL ENVIRONMENTAL STATEMENT

Page 20 of 20

#### 2016-2017

#### To name few projects implemented in our industry in the last FY

#### • NOx emission reduction:

Optimization of Burner - Reduction of PA% (target PA% ~ 11%)

Reduce Swirl position by step of 10 mm (present 15mm).

Install thermocouples (min 2 Nos) in Hot spot area as discussed during site visit. (Ensure approach).

Ensure good refractory condition in Hot spot area to withstand ~ 1300 Deg C. (

Suitable refractory for withstanding temp 60-70% Al2O3, 1.5% < Fe2O3, Porosity < 18% and RUL >

#### • Energy Reduction Projects in 2016-2017:

SEEC Reduction in Raw mill Fan Line 1.

Line 2, Coal mill : chain conveyor replaced by Weigh Feeder.

Direct pumping of raw water from mines pit to plant

Line 2, Coal mill : Feeding belt diverter installed

Line 2, Kiln feed Extraction system modification

Line 2, Optimization of Reverse air Fan

Installation of bypass chute for coal crusher Auto operation of jockey pump (Hydrant system)

Boiler 4 : Grid panel nozzle replacement

ESP 4 Power optimization project (TPP)

Reduction in Auxiliary power of RO Plant at TPP

#### • Projects proposed for 2017-2018

Reduction in PH fan power consumption by installation of downcomer duct Water Spray system. Modification of Packer no. 7 to WLM to enhance dispatch volume

Slag Drying System Fluidized Bed Type.

Preheating of primary air for kiln main burner. (Reduction in STEC) for both lines.

Improve cooler recuperation efficiency by modification in horseshoe area and bottom sealing arrangements for Line-1.

Reduction in Fly ash conveying power consumption. (Replacement of pneumatic conveying by mechanical conveying)

Installation of Camera at Cement mill inlet, Lime stone feeding conveyor, Coal feeding conveyor belt for better operational control & House-keeping (IMT)

Installation of VFD for PA Fan at TPP.

Installation of Steel Silo 2500 MT to meet market demand and fulfill customer's expectations.