



Factory Office:  
Kumarasamy Raja Nagar – 521 457.  
Jaggayyapet Taluk, Krishna Dist. Andhra Pradesh.  
Phone : (08654) 224400 - 09 (10 Lines)  
Fax : (08654) 222532  
E-mail : mcljpm@ramcocements.co.in

**THE RAMCO CEMENTS LIMITED**  
(Formerly known as Madras Cements Ltd.)

RCL/PCB/48/2016-17

09<sup>th</sup> September 2016

The Environmental Engineer,  
AP Pollution Control Board,  
Regional Office,  
Plot No.41, Kanakadurga Officers Colony,  
Opp. SBH, Gurunanak Road,  
**VIJAYAWADA – 520 008.**

Dear Sir,

**Sub: Submission of Environmental Statement in Form - V for Cement Plant including Thermal Power Plant for the Financial Year – 2015-16 - Reg.**

Please find enclosed herewith three sets of Environmental Statement in Form - V for Cement Plant including Thermal Power Plant for the financial year 2015-16 along with relevant enclosures.

This is for your kind information and records please.

Thanking you.

Yours faithfully,  
For The Ramco Cements Ltd.,

T SRIVIDYA  
Asst. Vice President (Works)

Encl: As above.

# **ENVIRONMENTAL STATEMENT (FORM – V)**

**FOR FINANCIAL YEAR 2015-16**

## **CEMENT PLANT & THERMAL POWER PLANT**

**An  
QMS- IS / ISO 9001:2008,  
EMS- IS/ ISO 14001:2004,  
OHSMS- IS 18001:2007,  
EnMS – ISO 50001:2011  
Certified Company**



**THE RAMCO CEMENTS LIMITED,  
KUMARASAMY RAJA NAGAR 521457  
JAGGAIHPET (M),  
KRISHNA DIST., AP.**

**ENVIRONMENTAL STATEMENT (FORM – V)  
FOR FINANCIAL YEAR 2015-16  
PART – A**

1.	Name and address of the owner / occupier of the industry operation or process	:	The Ramco Cements Limited (Formerly Madras Cements Ltd) K.S.R. Nagar - 521 457, Jaggiahpet Mandal, Krishna Dt., A.P
	Industry operation or process	:	Cement manufacturing process along with thermal power generation
2.	Date of the last environment audit report submitted	:	23 <sup>rd</sup> September 2015

**PART – B  
WATER AND RAW MATERIAL CONSUMPTION**

**(i) Water consumption m<sup>3</sup>/day:**

Cement Plant Cooling & Domestic	2268.9 m <sup>3</sup> /day
TPP Cooling & Boilers	1743.1 m <sup>3</sup> /day
<b>Total</b>	<b>4012.0 m<sup>3</sup>/day</b>

Name of the product (s)	Water consumption per unit of products		
	Unit	During the previous financial year (2014-15)	During the current financial year (2015-16)
Cement*	m <sup>3</sup> /Tonne	0.7616	0.9809
Power	m <sup>3</sup> /lakh kWhr	463.32	395.56

\* With the lesser production of cement in the financial year 2015-16 while compared to the year 2014-15, the water consumption for Tonne of cement is increased in the year 2015-16.

**(ii) Raw material consumption:**

	Name of the raw material	Consumption of raw material, MT	
		During the previous financial year (2014-15)	During the current financial year (2015-16)
1.	Limestone (from captive mines)	19,98,588.00	13,84,454.00
2.	Additives		
	a) Laterite High Grade	81,614.64	69,120.085
	b) Iron Rich Laterite	6,730.07	12,759.55
	c) Iron Ore	20,963.165	17,793.115
	d) Lime Sludge	4,989.64	0
	e) Feldspar	0	1,033.00
	f) Iron Sludge	4,053.765	6,894.18
	g) Imported Iron Ore	0	2,429.58
	h) Fire Clay	0	43.08
3.	Fuels (For Kilns & TPP)		
	a) Indigenous Coal	1,84,927.089	61,589.20
	b) Imported Coal	2,23,391.74	1,53,915.52
	c) Imported Pet Coke	2,953.999	36,833.77
	d) Power Plant Reject	0	1,476.97
4.	Alternate Fuel	18.91	76.47
5.	Fly ash	2,22,595.24	16,0198.77
6.	Gypsum (Indigenous & Imported)	38,153.452	41,042.40
7.	Slag	2,3635.36	60,112.50

**PART- C**  
**(Parameter as specified in the consent issued)**

Pollution Type	Pollution Board Norms	Quantity of Pollution Generation	% of Variation from Prescribed Standards with Reason	Remarks
----------------	-----------------------	----------------------------------	--	---------

**(a) Water**

No process effluent generation from cement manufacturing. Mine seepage water is being allowed to settle in mine sump. The sump outlet water is used for cement plant & power plant process requirements, water sprinkling purpose, greenbelt purpose, domestic water requirements, etc. The measures initiated to conserve water reserve are:

- Stopped the extraction of bore well water for drinking water usage. Mine seepage water is being used for the same purpose.
- Part of the thermal power plant treated effluent is being used for cooling purposes in the cement plant. Part of the same is used for greenbelt activities in the plant premises.
- Reverse Osmosis (for drinking water purpose) effluent is being used for greenbelt activities in colony.
- Treated waste water from sewage treatment plant is being used for greenbelt activities by constructing sumps at elevated areas (by pumping to these tanks and supply from greenbelt areas by gravity).

Details of month wise outlet samples analysis of TPP effluent treatment plant, sewage treatment plant and auto garage oil & grease trap, carried out in the year 2015-16 (by MoEF&CC approved environmental monitoring agency) are enclosed as Annexure - I. Average values of month wise outlet samples analysis of TPP effluent treatment plant, sewage treatment plant and auto garage oil & grease trap are as follows:

**(i) TPP ETP Treated Effluent:**

Parameter	Unit	Norm	Average Value / Range (2014-15)	Average Value / Range (2015-16)
pH		5.5 - 9.0	7.58 – 8.32	7.44 – 8.52
TDS	mg/L	2100	1741.0	1370.1
TSS	mg/L	100	66.7	61.3
COD	mg/L	250	77.5	55.2
BOD	mg/L	100	20.0	13.7
O & G	mg/L	10	1.4	1.4

**(ii) STP Treated Waste Water:**

Parameter	Unit	Norm	Average Value / Range (2014-15)	Average Value / Range (2015-16)
pH		5.5 - 9.0	7.25 – 7.71	7.24 – 7.72
TDS	mg/L	2100	720.7	657.6
TSS	mg/L	100	66.0	66.8
COD	mg/L	250	39.2	51.3
BOD	mg/L	100	10.9	15.4
O & G	mg/L	10	1.2	1.5

**(iii) Auto Garage Oil & Grease Trap Treated Waste Water:**

Parameter	Unit	Norm	Average Value / Range (2014-15)	Average Value / Range (2015-16)
pH		5.5 - 9.0	6.48 – 7.36	7.22 – 7.62
TDS	mg/L	2100	1927.0	1706.3
TSS	mg/L	100	87.5	70.3
COD	mg/L	250	227.7	141.2
BOD	mg/L	100	85.8	46.2
O & G	mg/L	10	8.4	7.4

**(b) Air:****(i) Ambient Air Quality Monitoring:**

Details of month wise ambient air quality monitoring carried out near to the plant premises in the year 2015-16 (by MoEF&CC approved environmental monitoring agency) are enclosed as Annexure - II. Ambient air quality monitoring carried out in the nearby villages for the same period is enclosed as Annexure - II. Average values of month wise ambient air quality monitoring carried out near to the plant are as follows:

Location	Parameter	Average concentration, $\mu\text{g}/\text{m}^3$
Dharmavarapadu Thanda	PM <sub>2.5</sub>	29.96
	PM <sub>10</sub>	56.96
	SO <sub>2</sub>	15.51
	NO <sub>x</sub>	27.13
Own Your House Colony / Chillakallu	PM <sub>2.5</sub>	36.38
	PM <sub>10</sub>	55.46
	SO <sub>2</sub>	15.33
	NO <sub>x</sub>	25.12
K Agraharam Village	PM <sub>2.5</sub>	30.58
	PM <sub>10</sub>	50.42
	SO <sub>2</sub>	14.55
	NO <sub>x</sub>	24.03
Padmavathi Nagar	PM <sub>2.5</sub>	27.17
	PM <sub>10</sub>	49.42
	SO <sub>2</sub>	14.40
	NO <sub>x</sub>	25.03
Jayanthipuram	PM <sub>2.5</sub>	31.63
	PM <sub>10</sub>	59.71
	SO <sub>2</sub>	14.18
	NO <sub>x</sub>	27.03
Ravirala Village	PM <sub>2.5</sub>	34.88
	PM <sub>10</sub>	52.25
	SO <sub>2</sub>	16.15
	NO <sub>x</sub>	23.98
Vedadiri Village	PM <sub>2.5</sub>	33.75
	PM <sub>10</sub>	51.63
	SO <sub>2</sub>	16.12
	NO <sub>x</sub>	23.58
Jaggayyapet	PM <sub>2.5</sub>	39.13
	PM <sub>10</sub>	57.83
	SO <sub>2</sub>	16.17
	NO <sub>x</sub>	24.34
Budawada	PM <sub>2.5</sub>	29.54
	PM <sub>10</sub>	46.38
	SO <sub>2</sub>	16.66
	NO <sub>x</sub>	24.58

Parameter	Unit	Norm	Near Temple		Near K Type Colony		KNR Colony Area / Near Auto Garage	
			2014-15	2015-16	2014-15	2015-16	2014-15	2015-16
PM <sub>10</sub>	µg/m <sup>3</sup>	100	47.8	60.3	41.8	51.0	58.2	69.5
PM <sub>2.5</sub>	µg/m <sup>3</sup>	60	17.2	15.8	14.7	14.0	20.8	18.3
SO <sub>2</sub>	µg/m <sup>3</sup>	80	7.9	10.6	7.5	9.4	8.8	11.1
NO <sub>x</sub>	µg/m <sup>3</sup>	80	11.7	13.6	10.8	12.3	13.2	14.8
CO	mg/m <sup>3</sup>	4	0.42	0.16	0.42	0.14	0.45	0.20

**(ii) Stack Monitoring:**

Details of month wise stack monitoring carried out in the year 2015-16 (by MoEF&CC approved environmental monitoring agency) are enclosed as Annexure - III.

S. No.	Stack Attached to	Norm	Average Value of SPM (2014-15)	Average Value of SPM (2015-16)
1	Kiln - I Bag House	115	41.5	-----
2	Coal Mill - I Bag House	115	31.8	-----
3	Cooler - I ESP	115	37.0	-----
4	Cement mill Bag House	115	33.8	26.7
5	Cement Mill Bag Filter	115	37.3	27.2
6	Slag mill Bag House	115	36.0	24.4
7	Kiln - II RABH	50	35.8	23.4
8	Coal Mill - II Bag House	50	29.9	22.3
9	Cooler - II ESP	50	35.9	29.9
10	Limestone Crusher Bag House	115	22.5	22.2
11	Thermal Power Plant ESPs	50	36.3	43.6

Note: All values mentioned as mg/Nm<sup>3</sup>.

**PART – D**

**HAZARDOUS WASTES**

(As specified under Hazardous Wastes / Management and Handling Rules. 1989)

Hazardous Waste	During the previous financial year (2014-15)	During the current financial year (2015-16)
I. Hazardous Waste Disposed to external agencies		
Waste oil	13.65 kL	7.56 kL
Waste lead acid batteries	25 Nos.	----
II. Hazardous Waste Consumed (brought from external agencies)		
Iron Sludge	4053.765 Tonne	6894.18 Tonne

\* Copy of Form - 4 (submitted to APPCB) - Hazardous Waste generation / receipts and consumption / disposal details for both plant & mines in the year 2015-16 is enclosed as Annexure - IV.

## PART – E

### SOLID WASTES

	During the previous financial year (2014-15)	During the current financial year (2015-16)
(a) From process	No solid waste generated	No solid waste generated
(b) From pollution control facility		
From Cement Plant*	Not quantified	Not quantified
Fly Ash from Thermal Power plant**	42,139.55 Tonne	13,482.66 Tonne
Bottom Ash from Thermal Power Plant <sup>#</sup>	3,489 Tonne	1,620.57 Tonne
Sludge Cake from STP <sup>##</sup>	21.5 m <sup>3</sup>	40.43 m <sup>3</sup>
Sludge & Top Layer from ETP <sup>##</sup>	0	3 Tonne
(c) Quantity recycled or re-utilized		
From Cement Plant*	Total recycled	Total recycled
Fly Ash from Thermal Power plant**	42,139.55 Tonne	13,482.66 Tonne
Bottom Ash from Thermal Power Plant <sup>#</sup>	3,489 Tonne	1,620.57 Tonne
Sludge Cake from STP <sup>##</sup>	21.5 m <sup>3</sup>	40.43 m <sup>3</sup>
Sludge & Top Layer from ETP <sup>##</sup>	0	3 Tonne
Vermi-compost from colony garbage <sup>§</sup>	30 Tonne	45 Tonne

\* Dust collected from cement plant pollution control equipments is being totally recycled in the respective circuits to make it as a part of the product of the respective section. Thus there is no solid waste generation from cement plant.

\*\* Fly ash collected from captive thermal power plant pollution control equipment is being totally re-utilized in cement plant for production of PPC cement while using coal mix. While using pet coke, the fly ash is re-used for cement plant firing, as the ash contains partial un-burnt material.

<sup>#</sup> Bottom Ash from Thermal Power Plant is being used as admixture for concrete pavements and for filling of low laying areas.

<sup>##</sup> Dried sludge cake from STP and Sludge & Top Layer from ETP are used as manure for greenbelt, in place of chemical fertilizers.

<sup>§</sup> Vermi-composting for colony garbage is being used for greenbelt activities as manure, in place of chemical fertilizers.

## PART – F

### (Please specify the characteristics in terms of concentration and quantum)

*Hazardous as well as solid wastes and indicate disposal practice adopted for both these categories of wastes*

- Usage of Iron Sludge (received from other industries) as alternate raw material in cement manufacturing process is initiated in 2011-12 year and 4053.765 Tonne of Iron Sludge is used in the financial year 2014-15. Iron sludge usage in the financial year 2015-16 is 6,894.18Tonne.
- Copy of Form - 4 (submitted to APPCB) - Hazardous Waste generation / receipts and consumption / disposal details for both plant & mines in the year 2015-16 is enclosed as Annexure - IV.
- Dust collected from cement plant pollution control equipment is being totally recycled / re-utilized in the respective circuits to make it as a part of the product of the respective section. Thus there is no solid waste generation from cement plant.
- Fly ash generated from captive Thermal Power Plant is being totally reused in PPC manufacturing process. Bottom Ash from Thermal Power Plant is being used as admixture for concrete pavements and filling of low laying areas.

- Sludge collected from Thermal Power Plant Effluent Treatment Plant and Sewage Treatment Plant is being used as manure in greenbelt activities, in place of chemical fertilizers.
- Vermi-composting for colony garbage is being used for greenbelt activities as manure, in place of chemical fertilizers.

## **PART - G**

*Impact of the pollution control measures on concentration of natural resources and consequently on the cost of production*

- All the surrounding areas are kept free from pollution.
- The cost of power consumed for operation of various pollution control equipment operated in cement plant & thermal power plant in the financial year 2015-16 is Rs. 451.40 lakh against Rs. 848.03 lakh in financial year 2014-15 i.e., Rs. 53.69/tonne of cement in the financial year 2015-16 against Rs. 70.52/tonne of cement in the year 2014-15.
- The total capital cost incurred for various pollution control equipment for cement plant, thermal power plant and mines is Rs. 62.29 lakh in the financial year 2015-16 against Rs. 84.42 lakh in the financial year 2014-15.
- Total environmental protection expenditure made in the financial year 2015-16 (including capital and recurring for cement plant, thermal power plant and mines) is Rs. 1260.68 lakh against Rs. 1367.80 lakh in financial year 2014-15, i.e., nearly Rs. 149.94/tonne of cement in financial year 2015-16 against Rs. 113.74/tonne of cement in financial year 2014-15.
- The expenditure details for Environment Protection covering various measures carried out in the financial year 2015-16 are enclosed as Annexure - V.

## **PART - H**

*Additional investment proposal for environmental protection including abatement of pollution*

- Packing of cement is being done with electronic packers to control fugitive emissions. Coal and additives are handled with stackers & reclaimers with closed sheds to control the fugitive dust while handling.
- 3 Nos. of road sweepers are being used for sweeping all major roads of cement plant. Industrial vacuum cleaner is used and being used for better housekeeping.
- To control the fugitive emissions at packing plant area, bag filter is erected. To avoid fugitive emission while clinker handling, telescopic chute and hatch are arranged at clinker truck loading and clinker wagon loading areas respectively.
- To meet the latest emission norm of 30 mg/Nm<sup>3</sup> for cement plant, to optimum utilize the boiler capacities of thermal power plant and to meet the electrical efficiency at par with PAT scheme, the following measures are being proposed:
  - To replace the Cooler – I ESP with latest one. All other air pollution control equipments of cement plant are checked for the latest norm.



- To add additional pre-heater for Line – I Kiln with high efficiency cyclones.
- To add 6 MW Turbo Generator
- As part of these, the cement plant capacity will get increased from 2.80 million TPA clinker to 3.185 million TPA.

Application for ToR for this modernization and optimization project is submitted in the month of November 2014 and Public Hearing conducted on 25.08.2015 and EC order is under process. The cost of this new proposal is Rs. 100 crore.

#### **PART - I**

*Any other particulars in respect of environment protection and abatement of pollution*

- Detailed environmental protection measures are enclosed as Annexure - VI.
- Environmental Management System IS / ISO 14001:2004 from 2005 is implemented along with Quality Management System IS / ISO 9001:2008, Occupational Health & Safety Management System IS 18001:2007, Energy Management System ISO 50001:2011 and Work Place Management (5-S certification).

## ENVIRONMENTAL PROTECTION MEASURES

Ramco is a vibrant group of Companies with manufacturing activities in Cement, Textiles, Fibre-Cement Products, Wind Energy, Software Products, Surgical Dressings, Ready-Mix Concrete and Dry Mortar Plants.

The Ramco Cements Limited (formerly known as Madras Cements Ltd.) is a unit of the Ramco Group which has been growing steadily right from its inception with present capacity 16.5 Million Tonnes / Annum of cement. RCL, which has always been striving for Total Quality Management, possesses International Certificates IS/ISO 9001:2008, IS/ISO 14001:2004, IS 18001:2007 and ISO 50001:2011. The company has achieved various awards for 'Best Performance' in the Cement Industry and also Green Rating Project Awards 4 Leaves from Centre for Science and Environment for the Year 2005.

The KSR Nagar plant was presented with an Award in recognition of practicing 'Cleaner Production Measures' from AP Pollution Control Board, Hyderabad for the year 2011-12 on the eve of World Environment Day – 05<sup>th</sup> June 2012. Captive Limestone Mines are obtaining awards regularly in Mines Environmental & Mineral Conservation Week and in Mines Safety Week celebrations. Captive Mines are using Non-el Delay Detonators, to reduce Ground Vibration and to avoid fly rocks & fugitive dust. Permanent water sprinkling system is installed on mines haul road to reduce fugitive dust.

### PRODUCTION DETAILS IN THE FINANCIAL YEAR 2015-16:

	Production Capacity of Plant	Production in the Financial Year 2015-16
Clinker	28,00,000 TPA	1021424.45 Tonne
Cement	36,50,000 TPA	840820.19 Tonne

### AIR:

**Air Pollution Control Measures:** All air pollution generation sources (major or fugitive) are attached with pollution control equipment. 2 Nos. of additional Agglomerative Dust Suppression systems - water fogging (at additive handling area & coal handling area) are installed in the financial year 2015-16. Total 84 Nos. of APCE in cement plant & 9 Nos. of APCE in TPP are in operation. Various air pollution control equipment operating at Cement Plant & Thermal Power Plant are narrated in Annexure - VII. In the event of pollution control equipment not working, the respective unit(s) are being stopped automatically in phased manner with associated interlocks.

Stack Monitoring: 10 major stacks are equipped with online stack monitors. Major stacks are being monitored by MoEF&CC approved external agency on monthly basis and reports are being submitted to the APPCB. Compiled data on stack monitoring in the year 2015-16 is enclosed in Annexure - III. Online stack monitoring data from these stacks is being uploaded to APPCB & CPCB websites.

Online stack monitors are installed for 10 Nos. major stacks, for which the details are:

Location of stack monitoring instrument	Make and model of the equipment	Year of installation	Remarks
Kiln – I Stack	Forbes Marshall, DCEM 2100	2010	BHA make installed in the year 2000, replaced with latest instrument in 2010.
Kiln – II Stack	Durag, Germany. DR 216	2009	
Cooler - I Stack	Durag, Germany. DR 216	2009	

Cooler – II Stack	Durag, Germany. DR 220	2009	
Coal Mill – I Stack	Durag, Germany. DR 220	2009	
Coal Mill – II Stack	Durag, Germany. DR 216	2009	
Cement Mill Vent Stack	Durag, Germany. DR 220	2009	
Cement Mill Separator Stack	Durag, Germany. DR 220	2009	
Slag Mill Stack	Forbes Marshall. DCEM 2100	2012	Baltec make installed in the year 2005, replaced with latest instrument in 2012.
Thermal Power Plant Stack	Forbes Marshall. DCEM 2100	2008	

**Ambient Air Quality Monitoring:** 2 Nos. of Continuous ambient air quality monitoring stations are installed at:

- Time Office
- Mines Office

to monitor the following parameters:

- PM<sub>10</sub>
- PM<sub>2.5</sub>
- SO<sub>2</sub>
- NO<sub>x</sub>

On-line Continuous Ambient Air Quality Monitoring data is linked up with APPCB & CPCB websites.

Ambient Air Quality is being monitored by MoEF&CC approved external agency on monthly basis at 3 locations (near to the boundary of the plant in 3 directions of the plant) and reports are being submitted to the APPCB. Compiled data on Ambient Air Quality monitoring in the financial year 2015-16 is enclosed in Annexure - II. Data on ambient air quality monitoring carried out in the nearby villages for the same period is enclosed in Annexure – II.

With the recent amendment in emission standard for cement plants from 50 mg/Nm<sup>3</sup> to 30 mg/Nm<sup>3</sup>, some of the bag filters are being upgraded with high quality filter bags. The cost incurred in the year 2015-16 in this account is Rs. 210.14 lakh.

An application is submitted to MoEF&CC on 03.11.2014 with respect to this new emission standard as well as to increase the clinker production from 2.80 million TPA to 3.185 million TPA clinker in Cement Plant and installation of 6 MW Turbo Generator in Thermal Power Plant (of present capacity 2 x 18 MW. ToR order is awarded for the same. Environmental Public Hearing conducted on 25.08.2016 and EC is under process.

## **WATER:**

### **Water Requirement:**

Total water requirement for Cement Plant, Thermal Power Plant and for Domestic Purposes is 4001.08 m<sup>3</sup>/day in the financial year 2015-16. Total water requirement for Captive Mines is 246.0 m<sup>3</sup>/day in the financial year 2015-16. Total water requirement for Cement Plant, Thermal Power Plant, Captive Mines and for Domestic Purposes is 4246.44 m<sup>3</sup>/day in the financial year 2015-16. For which, State Ground Water Department accorded permission for water withdrawal @ 7000 m<sup>3</sup>/day.

### **Waste Water Quality Analysis:**

Outlet samples from Sewage Treatment Plant (located at colony to treat sewage), Effluent Treatment Plant (to treat Thermal Power Plant effluents) and outlet of samples of Auto Garage Oil & Grease Trap are being analysed on monthly basis by MoEF&CC approved external agency and reports are being submitted to the Board regularly. The analysis data (for the financial year 2015-16) is narrated in Annexure - I. Treated sewage from STP & treated effluent from ETP being used for greenbelt development as well as for road sprinkling, etc.

Reverse Osmosis system is being used to generate purified water. This purified water is being supplied to plant premises, mines premises, colony and to contract workmen. RO plant inlet and outlet samples are being analysed regularly.

### **Water Conservation:**

48 Nos. of rain water harvesting structures are made to recharge the ground water in the colony by March 2016. 3 Nos. of rain water harvesting structures are made to recharge the ground water in the plant by March 2016. The locations of these pits are listed in Annexure - VIII. Water collected in mine pits is being used for cement plant, thermal power plant and for domestic purposes.

TPP effluent is being treated in effluent treatment plant. The wastewater from boiler blow down, DM plant regeneration waste water, UF & RO rejects and cooling tower blow down of TPP are being neutralized in neutralization tank and being used for greenbelt. Sewage treatment plant is in operation to treat domestic sewage from colony. Auto garage wash water is being treated at Oil & Grease Trap. Data of STP, ETP and Oil & Grease outlet samples analysis carried out by MoEF&CC approved agency on monthly basis being submitted to the Board regularly. These treated effluents are used for greenbelt, water sprinkling & partially for process activities and being maintaining 'zero discharge'. The excess waste water, if any, is being passed to pond in our own lands to uplift the water table nearby area.

### **Drinking Water:**

Reverse Osmosis (RO) plant is located at colony and purified water is being distributed to all offices, mines and colony houses. The analysis reports of RO plant inlet and outlet samples in the financial year 2015-16 are enclosed as Annexure - IX.

### **NOISE:**

RCL is regularly monitoring noise levels internally. Ear plugs / muffs are provided to the concerned employees, who are working at high noisy areas.

### **OCCUPATIONAL HEALTH:**

Occupational health check-ups are being carried out for new employees at the time of joining into the organization and occupational health surveillance programme is carried out for all the employees regularly. Full-fledged occupational health centre is established and services are being rendered by qualified occupational health specialist.

Occupational health checkup at the time of recruitment is being carried for all the employees as per Mines Rules, with the following tests:

- Lung function test
- ECG

- Chest X-ray
- Blood analysis test
- Urine analysis test
- Audiometry
- Checking colour blindness
- Stool Analysis
- Sputum (Optional)

The employees who are working at the time of initiation of this programme are covered for these tests. If any person failed in this health checkup, was not recruited. Like so, a baseline data on the health status of workmen in the Pre-recruitment stage was established. The same is being repeated periodically to update and to take action accordingly.

Occupational health surveillance on regular basis is being carried for all the employees, with the following tests:

- Clinical examination including Neurological assessment
- Lung function test
- ECG
- Chest X-ray
- Blood analysis test
- Urine analysis test
- Audiometry
- Checking colour blindness

If any person failed in this health checkup, he will be shifted / transferred to non-hazardous activities. Till now, no such case is observed.

Occupational Health Centre (with qualified Occupational Health Specialist) is established with the following facilities:

- X-ray
- ECG
- Spirometry (lung function test)
- Audiometry
- Semi-auto analyser to carryout bio-chemical tests
- Clinical lab for micro-biological tests (including sputum test)
- Checking colour blindness
- Dental chair
- Ambulance

The first aid box is made available for immediate treatment. First aid training is imparted to the selected employees regularly. The list of first aid members is being displayed at strategic places.

#### **BIO-MEDICAL WASTE HANDLING:**

Operating Occupational Health Centre to provide basic first aid facilities within the premises. Bio-medical waste from this Occupational Health Centre is being regularly collected by nearby APPCB authorized agent, M/s Safenviron Bio-Medical Treatment Plant for onward treatment. The agency collects the bio-medical waste on 48 hours basis.

Bio-Medical Waste Annual Returns in the stipulated format (for the calendar year) are being regularly submitted to the Board within stipulated time. Copy of Bio-Medical Annual Returns submitted for the calendar year 2015 is enclosed as Annexure - X.

#### **HAZARDOUS WASTE / SOLID WASTE HANDLING:**

Waste oil along with fresh fuel is being used for kiln firing while light up & for reclaimer lubrication and sold to APPCB authorized agents. Used lead acid batteries are sold to APPCB authorized agents.

Iron sludge is being used as alternate raw material in place of iron ore in raw mix. Six copy manifest (TREM) card is being used while handling the same. Copies of the manifest with respect to the utilized material are being submitted to Board regularly on monthly basis.

Copy of Form – 4, submitting quantities of various hazardous wastes available by 31<sup>st</sup> March 2016 along with consumption / dispatch of the same in the financial year 2015-16 for both plant and mines is enclosed as Annexure – IV.

The sludge from sewage treatment plant (STP) is being used as manure for greenbelt development. Organic wastes is subjected to vermin composting and used as manure for greenbelt. Inorganic wastes (papers and other wastes) are properly disposed off.

#### **CLEANER PRODUCTION PRACTICES:**

Various cleaner production practices are initiated to control air emissions as well as fugitive emissions from various sources, etc. These practices are:

- Some of the bag filters are being upgraded with high quality filter bags to meet the recent amendment in emission standard for cement plants from 50 mg/Nm<sup>3</sup> to 30 mg/Nm<sup>3</sup>.
- For better housekeeping, '5-S – Work Place Management' is implemented.
- Wet Scrubbers and ESPs (connected to other than Coolers & Thermal Power Plant) are replaced with Bag Houses / Bag Filters. Some of the Bag Houses / Bag Filters are upgraded.
- All mechanical packers are replaced with electronic packers for better operation and to control fugitive emissions.
- Cement Mill Pregrinding: High Impact Crusher (HIC) replaced with Vertical Roller Pre-grinding Mill (VRPM).
- Provided additives storage shed and are handled with stacker & reclaimer.
- Coal required for cement plant is mostly received through railway wagons to railway siding in the plant premises.
- Fly ash generated from thermal power plant is being totally utilized in cement plant.
- 3 Nos. of road sweepers, 1 No. of vacuum cleaner and 1 No. of mobile water sprinkler are in operation to maintain clean environment.
- Crusher hopper water spraying system installed to control fugitive dust.
- Dry Water Fogging system installed at raw material hopper area, coal handling area and additive handling area.
- Closed silos are used for storing of clinker.
- Duoflex Burners are used for kiln firing to reduce NOx emission.
- Usage of low grade limestone (of silica content up to 18%) about 15 % quantities available in captive limestone mines.
- Usage of treated effluent from Thermal Power Plant Effluent Treatment Plant and Colony Sewage Treatment Plant for greenbelt, water sprinkling & partially for process activities and being maintaining 'zero discharge'. The excess waste water, if any, is being passed to pond in our own lands to uplift the water table nearby area.

- Permanent Water Sprinkling System installed at mines haul road.
- Most of the internal roads are paved with concrete to arrest fugitive dust.
- 2 Nos. of Continuous Ambient Air Quality Monitoring (CAAQM) stations and 10 Nos. of Online Stack Monitors installed and data being transmitted to APPCB & CPCB websites.
- Landscaping and Greenbelt development taken up in plant premises and township area for pleasant environment.
- Telescopic chute and hatch for the wagon loading spout are arranged at clinker truck loading and clinker wagon loading areas respectively to reduce the fugitive emission.
- To avoid the usage of plastic bags, steel carriages are distributed to workers for handling of food.

### **GREENBELT ACTIVITIES:**

Greenbelt is developed in an area of 130.24 ha by March 2016. An amendment is requested to the Ministry to amend the EC condition stating that 'greenbelt shall be developed in 172.75 ha (69.63%), out of total 248.08 ha'. The amendment request is discussed in the 31<sup>st</sup> EAC meeting of Industry Committee, MoEF&CC on 09<sup>th</sup> January 2015. The committee recommended for the following (Page No. 65, Point No. 31.9.6):

Permission to maintain a greenbelt area of 33% of total area of 248.08 Ha, in and around cement plant.

Extract of minutes of this meeting is enclosed herewith as Annexure – XI, for which EC amendment is under process. Emphasis is being made to maintain 130.24 ha greenbelt area in and around plant premises. Emphasis is also being made in planting dust capturing plants in consultation with local DFO to mitigate the effects of air emissions.

### **RECENT SOCIO - ECONOMIC MEASURES CARRIED OUT:**

As part of Corporate Social Responsibility, various socio-economic measures carried out. Cost of various socio-economic activities for the surrounding villages for the past 11 years (2003-14) is Rs. 4,05,79,555/- i.e., nearly Rs. 36.89/- lakh per annum. Amount spent for various socio-economic activities in the financial year 2014-15 & 2015-16 are Rs. 54.18 lakh & Rs. 42.40 lakh respectively. The details are enclosed as Annexure - XII. Some of the major initiatives taken in the financial year 2015-16 are as follows:

- Medical camps conducted in nearby villages. 36 Nos. of medical camps conducted in nearby villages in the year 2015-16 and medicines are being distributed at free of cost.
- Annadanam programmes on the eve of Founder's Day.
- Rebate is given for School Fee for the Children of Contract Workmen, studying at SSVR Mandir School.
- Dust bins provided for the nearby villages, as part of Swatch Bharat.
- Tri-cycles provided for garbage disposal in the villages, as part of Swatch Bharat.
- Water filter systems for Jayanthipuram village and Dharmavarapupadu Thanda village for safe drinking water.
- Up-gradation of fire station (greenbelt development) at Jaggaiahpet.
- Contributed for construction of compound wall and toilets at Ravirala Anganwadi School.
- Contributed for laying of hand railing near Anjaneya Temple at Ravirala.
- Construction of drain at Dwarakapuri colony at Jayanthipuram village.
- Financial support towards laying of roads in Own Your House colony at Chillakallu village.

- Engagement of JCB for leveling and dozing work for Ashramam and Goshala near Vedadri temple.
- Water supply for agriculture fields at Jayanthipuram Village.

#### **EXPENDITURE INCURRED FOR ENVIRONMENT PROTECTION:**

Various expenditures incurred for environment protection measures (other than socio-economic measures) are listed in Annexure - V. The total amount incurred on this in the financial year 2015-16 is Rs. 1260.68 lakh i.e., nearly Rs. 149.94/tonne of cement. Rs. 451.40 lakh (Rs. 53.69/tonne of cement) is incurred for operation of various pollution control equipment towards power charges.

Budget proposed for various environment protection measures for the financial year 2016-17 is with a sum of Rs. 900.0 lakh.

#### **ENERGY CONSERVATION:**

- To reduce the thermal energy consumption from 765 kCal/kg clinker to 735 kCal/kg clinker and to reduce the electrical energy consumption for kiln from 30 kWh/tonne of clinker to 24 kWh/tonne of clinker, Expansion & Modernization project is initiated for Line – I Kiln.
- To optimize the utilization of Coal Based Boilers, 6 MW Turbo Generator is proposed to install.
- The available hot gases are utilized for drying of raw materials in Vertical Roller Mills. Gas temperature after the mills is about 90°C.
- Pet coke is being used to supplement fuel requirements.
- Process of replacing the ordinary electrical bulbs with LED bulbs is under progress.
- Energy Management System (EnMS) is being implementation.

#### **CELEBRATION OF WORLD ENVIRONMENT DAY:**

- On the eve of World Environment Day – 5<sup>th</sup> June 2015, plantation activity conducted at plant premises, mines premises, colony premises and at surrounding areas.
- Distributed WED – 2015 batches (prepared by National Safety Council) to our employees and took Environmental Oath.