

## **Environmental Statement**

### **Form V**

Environmental statement is process of self-Inspection for Improvement in Processes and Reduction in Waste over the last year.

In today's world every industry is optimizing their Sources, equipments, Processes to face increasing competitions are forced to minimize Environmental pollution. There is need of pressure on Pollution contributing industries to optimize their production by improving production technologies.

The only mandatory process in Environmental Statement is to fill up the Form V and submit it to Pollution Control Board. If you notice Form V there are fields where industry needs to put their last year's Numbers with Current Years Numbers to identify where they stand.

Notification for Environmental Statement form v Published on 28 Apr 1992 by Ministry of Environment and Forest. As per act (Water, Air and Hazardous waste) Every Industry should submit environmental Statement for financial year ending (i.e. 31st Mar) to concerned state Pollution Control Board.

**[14. SUBMISSION OF ENVIRONMENTAL 2 [STATEMENT]** Every person carrying on an industry, operation or process requiring consent under Section 25 of the Water (Prevention and Control of Pollution) Act, 1974 (6 of 1974) or under section 21 of the Air (Prevention and Control of Pollution) Act, 1981 (14 of 1981) or both or authorization under the Hazardous Wastes (Management and Handling) Rules, 1989 issued under the Environment (Protection) Act, 1986 (29 of 1986) shall submit an environmental 2 [statement] for the financial year ending the 31st March in Form V to the concerned State Pollution Control Board on or before the 3 [thirtieth day of September] every year, beginning 1993.]

### **Information Collected through Environmental Statement Form V**

In the Environmental Statement every industry should to provide Information on Production, Consumption of raw, Water, Pollutants discharged in environment, Solid and Hazardous waste with their Treatment Processes.

#### **Important things to be reported to Pollution control board are:**

- If that company is reusing its by-products or waste material which results in Reduction in consumption of Air, Water or energy.
- Production cost

- Additional Investment proposals for environmental Protection i.e. up-gradation, Improvement in Process or New Equipments to reduce Environmental Pollution.

### **Environmental Statement Form V Filling Process**

There are total Nine Section in Environmental Statement Form V. it Can be Downloaded from here

#### **Part A**

Basic Information About Company Like Name, Address, Industry Category, Production Capacity and Date of Last Environmental Audit Submitted.

#### **Part B**

This Part is for Comparison of Water and Raw Material consumption for this financial year to previous year.

#### **Part C**

This Part is to measure Pollutants Discharged to Environment through medium Air and Water. How much in excess, an industry is releasing the pollutants into the environment.

#### **Part D**

This part to Measure Hazardous Waste from processes and from Pollution control Facilities

#### **Part E**

This Part is to measure Solid waste generated by industry. Also details like Quantity recycled, Sold and Disposed

#### **Part F**

Any new practices adopted to reduce Hazardous waste.

#### **Part G**

Impacts of pollution control measures on natural resources and with Cost of Production.

#### **Part H**

Additional Investment / Process / measures to minimization or prevention of pollution.

#### **Part I**

In this part other information / initiatives to improve quality of Environment needs to be given.

Whenever Part C, indicates high Variation then Part H (i.e. Additional Investment Proposals for environmental protection including abatement of pollution) should be taken more seriously

<sup>1</sup>[FORM-V]

(See rule 14)

**Environmental statement for the financial year ending the 31<sup>st</sup> March .....****PART-A**

- (i) Name and address of the owner/occupier of the industry operation or process
- (ii) Industry category Primary – (STC Code) Secondary – (SIC Code)
- (iii) Production capacity – Units -----
- (iv) Year of Establishment
- (v) Date of last environmental statement submitted

**PART-B****Water and Raw Material Consumption**

(i)	Water consumption m <sup>3</sup> /d		
	Process		
	Cooling		
	Domestic		
Name of Products		Process water consumption per unit of product output.	
		During the previous financial year	During the current financial year
		(1)	(2)
(1)			
(2)			
(3)			

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<sup>1</sup> Substituted by Rule 2(b) of Environment (Protection) Amendment Rules, 1993 notified vide G.S.R. 386 (E) dated 22.04.1993.

**(ii) Raw material consumption**

*Name of raw materials	Name of Products	Consumption of raw material per unit of output	
		During the previous financial year	During the current financial year

\* Industry may use codes if disclosing details of raw material would violate contractual obligations, otherwise all industries have to name the raw materials used.

**PART-C**

Pollution discharged to environment/unit of output  
(Parameter as specified in the consent issued)

(1) Pollutants	Quality of Pollutants discharged (mass/day)	Concentrations of pollutants discharges (Mass/volume)	Percentage of variation from prescribed standards with reasons.
(a) Water			
(b) Air			

**PART-D****HAZARDOUS WASTES**

(As specified under <sup>1</sup>[Hazardous Wastes (Management, Handling and Transboundary Movement) Rules, 2008])

Hazardous Wastes	Total Quantity (Kg.)	
	During the previous financial year	During the current financial year

(a) From process

(b) From pollution control facilities

<sup>1</sup> The Hazardous Wastes (Management, Handling and Transboundary Movement) Rules, 2008 notified vide S.O.2265(E), dated 24.9.2008.

**PART-E**  
**Solid Wastes**

	Total Quantity	
	During the previous financial year	During the current financial year

- (a) From process
- (b) From pollution control facilities
- (c) (1) Quantity recycled or re-utilized within the unit.
  - (2) Sold
  - (3) Disposed

**PART-F**

Please specify the characterizations (in terms of composition of quantum) of hazardous as well as solid wastes and indicate disposal practice adopted for both these categories of wastes.

**PART-G**

Impact of the pollution abatement measures taken on conservation of natural resources and on the cost of production.

**PART-H**

Additional measures/investment proposal for environmental protection including abatement of pollution, prevention of pollution.

**PART-I**

Any other particulars for improving the quality of the environment.

[F.No. Q-15015/1/90-CPA]  
MUKUL SANWAL, Jt. Secy.

Environment Statement		
FORM – V		
(See rule 14 of The Environment Protection Act, 1986)		
Environmental Audit Report for the financial year ending on 31 <sup>st</sup> March 2018.		
PART – A		
General Information		
	Name of the Company	Bhushan Energy Limited
1.	Name & Address of the owner/occupier of the industry, operation or process	Sri Shankar Batra Director Bhushan Energy Limited At-Ganthigadia PO – Nuahata Via- Banarpal Dist- Angul Pin -759128, Odisha
2.	Industry Category Primary (STC Code), Secondary(STC Code)	Primary (AACCB7445HST001)
3.	Production capacity - Units	2 X 150 MW + 185 MW = 485 MW
4.	Year of establishment	2010
5.	Date of last statement	21.07.2017

PART – B		
Water & Raw material Consumption		
<b>B-1 : Total Water Consumption (m3/d)</b>		
	Total water consumption (m3/d)	
<b>Category</b>	<b>2016-17</b>	<b>2017-18</b>
Process (m <sup>3</sup> /d)	152	434
Cooling (m <sup>3</sup> /d)	13402	10466
Domestic(m <sup>3</sup> /d)	91	90
<b>B-2 : Water Consumption per unit of the product (m<sup>3</sup>/MT)</b>		
	Process water consumption per unit of product m <sup>3</sup> /MW)	
<b>Name of the Products</b>	<b>2016-17</b>	<b>2017-18</b>
Electricity	3.54	0.19
<b>B-3 : Raw Material Consumption</b>		
<b>Name of Raw materials</b>	<b>Name of Products</b>	<b>Raw material consumption per unit of product (MT per MW)</b>
		<b>2016-17</b> <b>2017-18</b>
Coal	Electricity	0.85      0.84

**PART – C**

**Pollution discharged to Environment per unit of output  
( Parameters as specified in the Consent issued)**

**C-1 : Water Pollution**

<b>Pollutant Parameter</b>	<b>Prescribed Standard</b>	<b>Quantity discharge(kg/d)</b>	<b>Concentration discharge (mg/l)</b>	<b>Percentage of variation from prescribed standards with reasons</b>
-	-	<b>Nil</b>	<b>Nil</b>	-

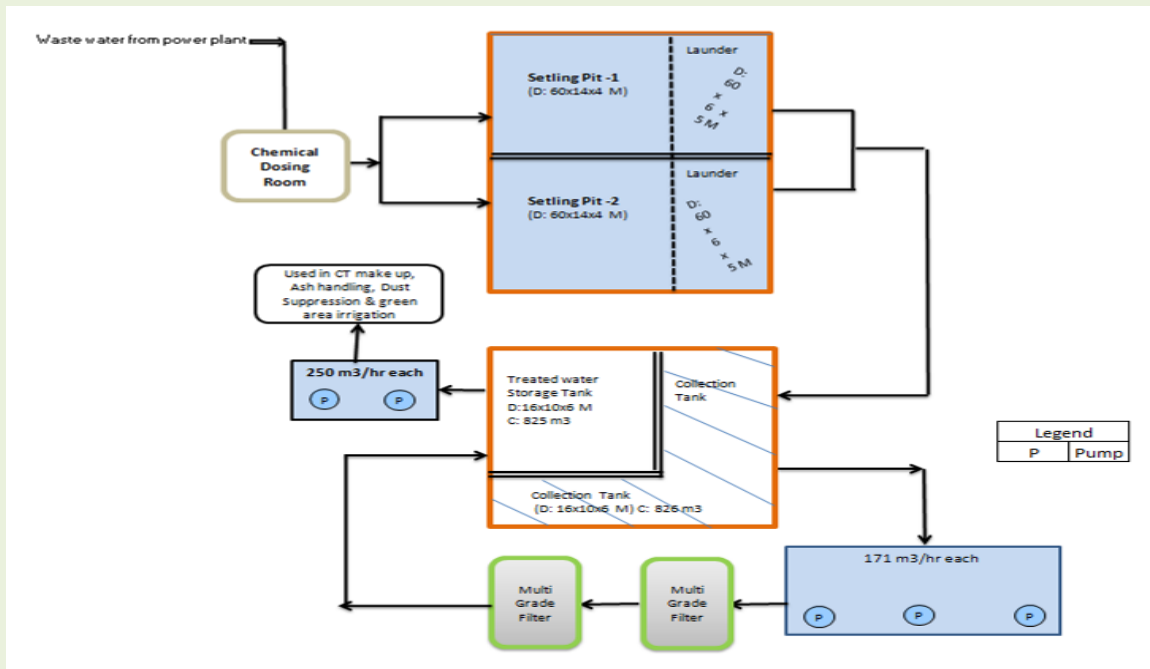
It is to be noted that since we are maintaining zero discharge of effluent hence the above discharge load is also zero.

**We have achieved zero discharge by installing appropriate settling tank and ETP for proper treatment of effluent and recycling back. Details are given below.**

1. **Common effluent treatment plant** - The waste water generated from power plant is taken into Effluent treatment plant and the treated outlet is reused in cooling towers, ash conditioning and also it is used as coal washery make up water. This ETP is consisting of settling tank, oil skimmer and dual media filter. Treated water is recycled back for cooling tower make up, coal washery make up, dust suppression and gardening purpose.



**Effluent Treatment Plant (ETP) Capacity: 350 m<sup>3</sup>/hr.**



## Waste water treatment Process from Power Plant

### 2. Settling tanks:

The waste water generated from floor washing and surface runoff through a network of drains is routed to settling tanks where heavy particles gets settled and only clear water is taken to ash handling purposes.



Settling Tank Near Boiler No-1 at



### 3. Sewage Treatment Plant:

We have developed 3000 KLD capacity sewage treatment plant near main ash silo area. The waste water generated from offices, canteen and toilets etc is treated and treated water is used for green area development.



**Sewage Treatment Plant (STP) Capacity: 3000 KLD**

### 4. Lagoon:

Three water lagoons of approximate holding volume of 80,000 m<sup>3</sup> have been constructed to treat, store and reuse surface run off during excess rain.



**Water lagoons**

### C-2 : Air Pollution

Pollutant Parameter	Prescribed Standard (mg/Nm <sup>3</sup> )	Quantity discharge (kg/d)	Concentration discharge (mg/Nm <sup>3</sup> )	Percentage of variation from prescribed standards with reasons
<b>Particulate matter</b>				
ESP attached to Boiler-1	50	178.9	35.7	No Deviation. Values are within the prescribed standard because the ESPs are maintained properly.
ESP attached to Boiler-2	50	128.8	25.7	
ESP attached to Boiler-3	50	Shut down	Shut down	
ESP attached to Boiler-4	50	201.5	40.2	
ESP attached to Boiler-5	50	888.9	25.9	
ESP attached to Boiler-6	50	795.2	23.1	

Appropriate air pollution control devices have been adopted for minimizing air pollution at source itself. 8 nos. of electrostatic precipitators, 02 nos. of bag filters 108 nos. of dry fog systems nozzles and 167 nos. of gun sprinklers have been installed in various departments which are keeping air quality parameters well within norms.



**Electrostatic Precipitator (ESP)**



**Dry Fog System**



**Gun Sprinklers**

PART - D		
Hazardous Wastes (As specified under The Hazardous Waste Management, Handling & Transboundary Movement Rules, 2008)		
D-1 : Generation from Process		
	Total Quantity (MT/KL)	
Name	2016-17	2017-18
1. Used Oil	16.38	Nil
2. Waste containing oil	0.24	0.21
3. Spent resins	Nil	Nil
4. Insulation material	7.25	21.98

PART - E		
Solid Wastes		
E-1 : Generation from Process		
	Total Quantity (MT)	
Name	2016-17	2017-18
1. Bottom Ash	163229.51	68419.21
E-2 : Generation from Pollution Control Facilities		
	Total Quantity (MT)	
Name	2016-17	2017-18
1. Fly Ash	380869.00	159645.88
E-3 : Quantity Recycled/Reutilized within the Unit		
	Total Quantity (MT)	
Name	2016-17	2017-18
Fly Ash	17945.59 (for brick manufacturing )	9407.59 (for brick manufacturing )
Bottom Ash	-	-
E-4 : Quantity Sold		
No solid wastes are sold		
E-5 : Quantity Disposed		
No solid wastes are disposed		

PART - F			
Please specify the characterizations (in terms of composition in quantum) of hazardous as well as solid wastes and indicate disposal practice adopted for both this categories of wastes			
F-1 : Hazardous Wastes			
Description	Constituent parameter	Concentration	Disposal practice
1. Used Oil	Analysis report attached as annexure - I		Sold to Authorized Recyclers
2. Waste containing oil	-		Stored in MS drum under covered shed before firing in the boiler.
3. Insulation Material	-		Storage under cover shed. This will be disposed at Common Hazardous Waste Treatment Storage Disposal Facility (CHWTSDF) site when we will

		have sufficient quantity.
4. Spent resins	-	Storage in barrel under cover shed with concrete floor. This will be disposed at Common Hazardous Waste Treatment Storage Disposal Facility (CHWTSDF) site when we will have sufficient quantity.
<b>F-2 : Solid Wastes</b>		
1. Fly Ash	Analysis report attached as annexure - II	Utilized in road construction, bricks manufacturing and filling of abandoned stone quarry at Brahmanbasa .
2. Bottom Ash	Analysis report attached as annexure - II	Utilized in filling of low-lying area at Mahisapat.

We have made proper arrangements for storage of hazardous waste. Covered shed with concrete floor, all round garland drain and catch pit has been provided for safe storage before disposal to authorized recyclers.



**Oil Storage Shed at BEL**

We have permission for ash disposal into stone quarry as well as low-lying nearby areas. Ash generated is conveyed to ash silos in dry form pneumatically to avoid any kind of fugitive emission during transfer in hyvas after proper conditioning to maintain about 15 % moisture to contain fugitive emission during loading, transportation and un-loading. Then Hyvas are fully covered and all sides are secured before these vehicles leave our premises for destination to ensure that no spillage takes place during transportation Fly ash is being disposed into abandoned stone quarries or low-lying and reclamation as per C-Farm guidelines.

Fly ash is also utilized in brick manufacturing internally as well as supplied to other brick making units, free of cost. It is also supplied to agencies engaged in road and highway construction.





**Ash disposal at  
Brahmanbasa stone quarry**

**After reclamation of Baldiabandh**

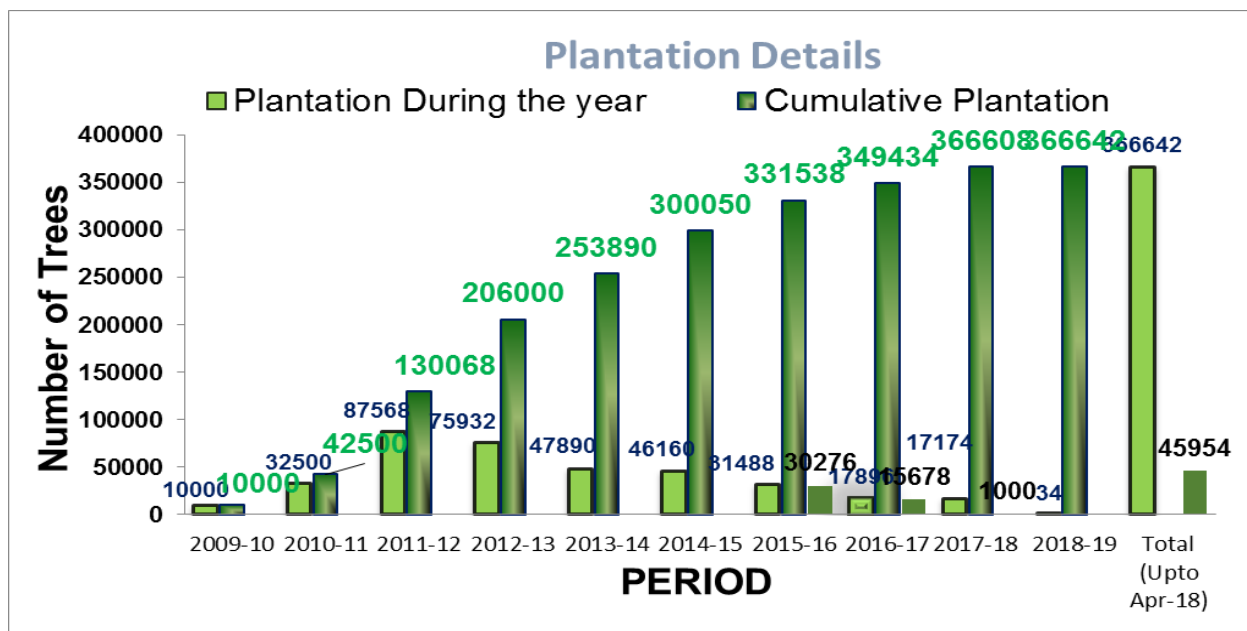
<b>PART - G</b>		
<b>Impact of pollution control measure on conservation of natural resources and cost of production</b>		
<b>G-1 : Cost estimation of Pollution Control</b>		
<b>Description</b>	<b>Expenditure in Crore during 2017-18</b>	
	<b>Capital cost</b>	<b>Recurring cost</b>
1. Water Pollution	0.015	0.306
2. Air Pollution	0	2.481
3. Solid & Hazardous Waste Management	0	11.672
4. Green belt development	0	0.050
5. Others (Housekeeping)	1.279	0.662
<b>Total</b>	<b>1.294</b>	<b>15.621</b>

<b>PART - H</b>			
<b>Additional measures/investment proposal for environmental protection including abatement of pollution, prevention of pollution</b>			
<b>H-1 : Water Pollution</b>			
<b>Description</b>	<b>Purpose</b>	<b>Estimated Cost in crore</b>	<b>Year of installation</b>
<b>Details are enclosed as Annexure-III</b>			
<b>H-2 : Air Pollution</b>			
<b>Description</b>	<b>Purpose</b>	<b>Estimated Cost in crore</b>	<b>Year of installation</b>
<b>Details are enclosed as Annexure- III</b>			
<b>H-3 : Solid &amp; Hazardous waste management</b>			

Description	Purpose	Estimated Cost in Crore	Year of installation
Details are enclosed as Annexure-III			
<b>H-4 : Greenbelt development</b>			
Description	Purpose	Estimated Cost in crore	Year of installation
Enhancing green coverage by creating gardens and undertaking mass tree plantation in and around the complex. (BSL & BEL)	Enhancing green coverage to enrich ecological and biodiversity wealth of the region.	4.0	2018-19

We have planted 366642 nos. of plant in and around the Bhushan Energy Limited and Bhushan Steel Limited premises covering about 360 acres which is 26.33 % of total plant area.

The graphical representation of plantation details is given below.



The species planted are Cassia seamaea, Peltophorum pterocarpum, Delonix regia, Lagerstroemia speciosa, Plumeria alba, Bahaunia alba, Alistonia scholaris, Jacaranda mimosifolia, Polyalthia longifolia, Spathodea campanulata, Pouteria sapota, Psidium guajava, Mangifera indica, Ficus religiosa, Ashoka longifolia, Prunus avium, Mimusops elengi, Anthocephalus cadamba, Ficus starlight, Plumer, Dypsis lutescens, Ficus blackiana, Dalbergia sissoo, Azadirachta indica, Albizia saman, Pongamia pinnata, etc.

## PART - I

### Any other particulars undertaken for improving the quality of environment (Ongoing)

- **Fly Ash Management**

Presently ash is being disposed into abandoned stone quarries through covered trucks and low-lying area. But our final planning is to lay pipe from plant to mine void having distance of 32 Km. Laying of ash slurry pipeline has already been started and 4 KM work has completed. All necessary permissions have been obtained from various govt. organizations, pipes and pumps have also been procured. Hopefully in next 2 years' time pipelines will be laid and entire ash will go to mine void via pipelines. Water from mine void will be recycled back to plant.



**Basalt Lined Pipelines for ash Disposal**

- **Mechanized housekeeping practiced in the entire plant areas.**

Housekeeping is a very important aspect in cleanliness of the industrial plant. All our industrial housekeeping operations like floor cleaning, drains cleaning and roads sweeping are fully mechanized. We have procured many mechanized housekeeping equipments like road sweeping machines, excavator for drain cleaning, bobcats for muck and waste lifting, hyvas for transportation of waste etc. We also plan to procure sewer suction machine cum jet cleaner which will help in cleaning of septic tanks and also jammed culverts etc. All waste CG sheets etc. are lifted and compacted by machine so that it is easy to handle and put in melting furnace. We are also planning to buy a municipal waste compactor so that collection and transportation becomes handy.



**Road Sweeping Machine**

- **Up-gradation of STP**

We have undertaken the work of up-gradation of STP at township from 500 KLD to 1000 KLD to meet the excess waste water generation. The entire treated waste water is being utilized for green area development.



**Sewage Treatment Plant(STP) at Township**

Sewage treatment plant of 100 KLD has been made operational to treat waste water generated from BF-1 area and from central canteen. Entire treated water is used for green area development.

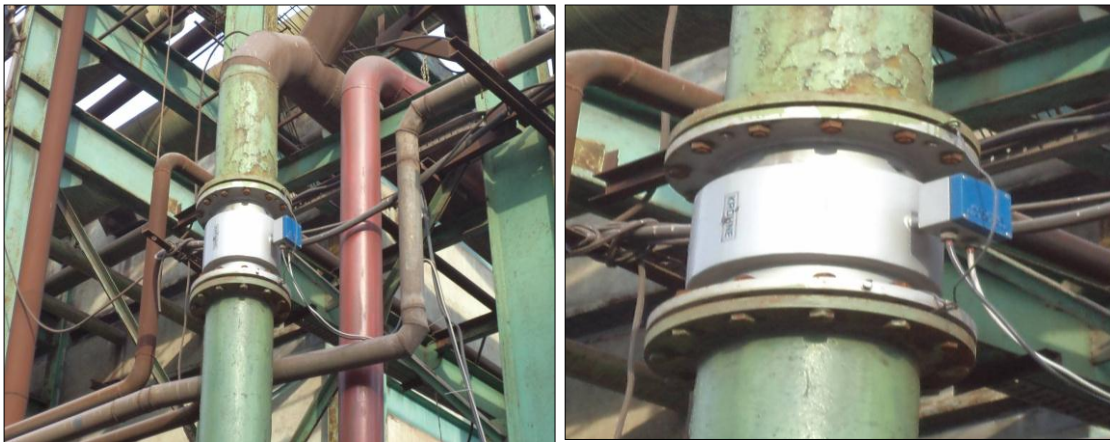


**Sewage Treatment Plant ( STP) from Blast Furnace-I Area**

- **Water meters to measure water consumption.**

Water conservation in BEL is one of our endeavors so that this natural resource can be saved for future generation. We have installed water flow meters in all water consuming lines in different departments so that we can monitor their water consumption and check whether they are using less or more and accordingly control the water feed. This will avoid wastage and also ensure water optimization for various processes and ultimately help us in optimizing water consumption, minimizing water wastage and ensure water conservation to a large extent.





**Flow Meters Installed Water Lines**

- **Large scale plantation program**

Greenery is our passion. We are trying to green every inch of our space available in our complex. Along the boundary we are planting trees to create green belt and in between units, gardens are being established to enhance the green coverage inside the complex which also enhances aesthetics. We are also contacting local govt. authorities to give us areas for tree plantation to demonstrate our commitment towards environment management and to protect ecological wealth of the area. Accordingly we are doing tree plantation outside our complex also. We have planted about 3.67 lakh of plant in and around the plant premises covering about 360 acres which is about 26.34% of total plant area.

We have also distributed free of cost, 45954 nos. of sapling to nearby educational institutions, local villagers/Panchayat.



**Green Belt development in plant premises**

- **Online ambient air quality data being sent to SPCB server through RT-DAS.**

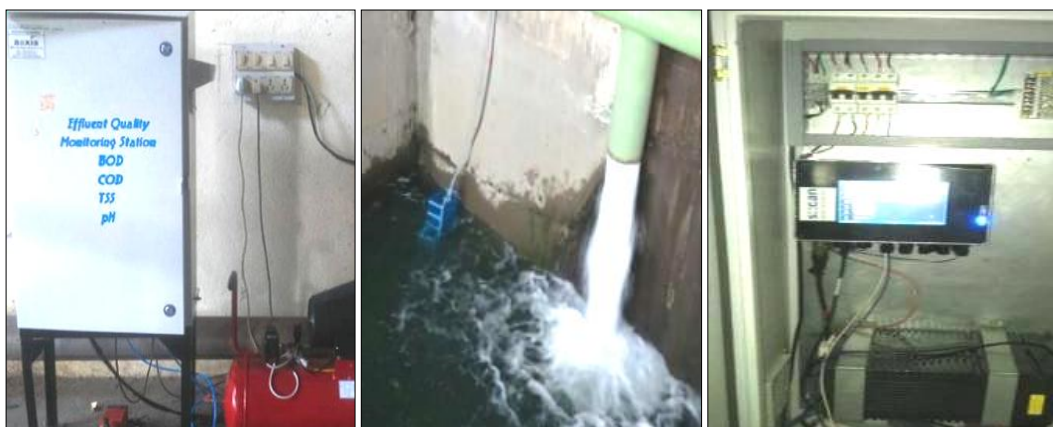
Environmental monitoring is very important aspect of environment management to know the efficacy of all the pollution control systems deployed. We have installed the state-of-the-art air network consists of 7(seven) **Continuous Ambient Air Quality Monitoring Stations (CAAQMs)**. We have installed 03 **Continuous Emission Monitoring Station (CEMS)** consisting of 03 dust analyzer and 03 Gas analyzer. We have also installed 01 (One) numbers of **Effluent quality Monitoring Station (EQMS)** and at all the ETP the flow meter is installed to quantify the recycled water. The instruments installed are approved by USEPA, TUV, and CPCB & OSPCB. Online water and air quality data is being sent to SPCB and CPCB servers through RT-DAS.



**Continues Ambient Air Quality Monitoring Station (CAAQMS)**



**Continues Emission Monitoring System (CEMS)**



**Waste Water Quality Monitoring System (WWQMS)**

- **Additional gun sprinklers at RMHS yards.**

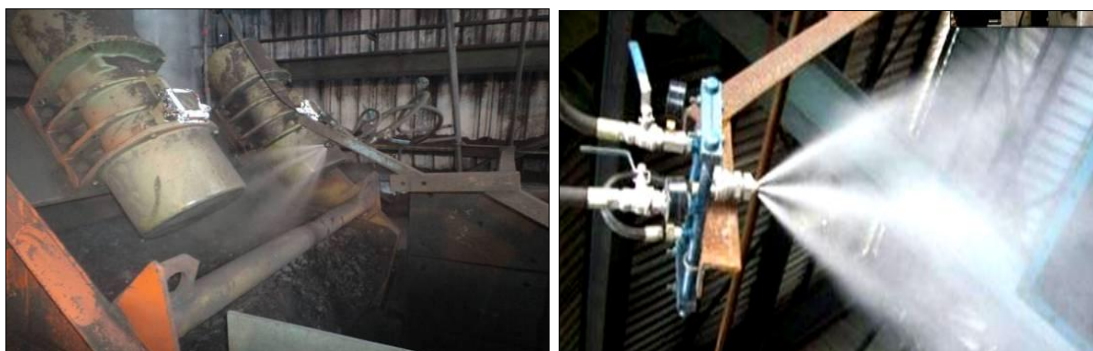
Raw material handling and storage area consist of 10 yards covering iron ore, coal, lime stone, dolomite and quartzite. These yards are fitted with high pressure gun sprinklers to ensure zero fugitive emission during handling of raw materials



**Gun Sprinkling**

- **Installation of Dry Fog System**

Raw material conveying through conveyer system is likely to generate fugitive dust especially at transfer point and junction houses. To reduce generation of dust during conveying of raw materials, dry fog systems have been installed at all potential location where dust is likely to generate during transportation.



**Dry Fog System**

- **World environmental Day celebration**

World Environment Day was celebrated on 5<sup>th</sup> June 2017 like previous years. Various activities were organized among children, ladies, workers, employees and local villagers to spread awareness about environmental protection, sustenance and eco-conscious growth. Details of the celebration are enclosed as **annexure-IV**.

- **Health, Safety & Environment Sankalp**

Health, Safety & Environment Sankalp is being organized on 1<sup>st</sup> of every month near main gate to reaffirm our commitment for safe, healthy and environmentally sound work place. Details are enclosed as **annexure-V**.

- **46<sup>th</sup> National Safety week**

National Safety week was celebrated during 4-10<sup>th</sup> March 2017 in the plant area. Details are enclosed as **annexure-VI**.