

O/C



Date: 14/09/2018

JPL/EMD/ES-TPP (4X600 MW)/2018 /144

The Member Secretary,  
Chhattisgarh Environment Conservation Board,  
Paryavas Bhavan North Block Sec.19  
Naya Raipur (CG) -490099

Sub: Submission of "Environmental Statement" for O. P. Jindal Super Thermal Power Plant (4 X 600 MW) of Jindal Power Limited at Tamnar, District Raigarh (C.G) for the Financial Year of 2017-2018.

Dear Sir,

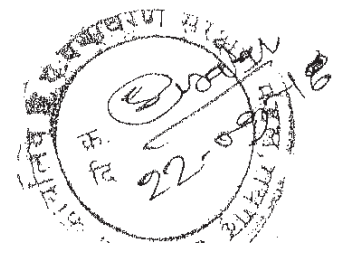
Submission of "Environmental Statement" for O. P. Jindal Super Thermal Power Plant (4 X 600 MW) of Jindal Power Limited at Tamnar, District Raigarh (C.G) for the Financial Year of 2017-2018  
Thanking you.

For Jindal Power Limited

HOD  
Environment Management Department

CC Regional Officer  
Chhattisgarh Environment Conservation Board,  
TV Tower Road Raigarh, C.G.

: For your kind perusal and record please.





**ENVIRONMENTAL STATEMENT**

**FOR**

**O.P. JINDAL SUPER THERMAL  
POWER PLANT (4 X 600 MW)**

**FOR THE YEAR - 2017-2018**

***SUBMITTED TO***

**CHHATTISGARH ENVIRONMENT  
CONSERVATION BOARD, RAIPUR  
(C.G.)**

**BY**



**JINDAL POWER LIMITED  
TAMNAR**



**FORM -V**  
**(See Rule 14)**

**(Environmental Statement for the Financial Year 2017-2018)**

**PART A**

**(i) Name and address of the owner/ occupier of the industry operation or process.**

Shri Gautam Chandra  
EVP,  
O.P. Jindal Super Thermal Power Plant,  
Jindal Power Ltd,  
Vill: Tamnar, Distt: Raigarh  
Chhattisgarh-496107

**(ii) Industry category Primary-(STC Code) Secondary-(STC Code).**

Primary- (STC Code): Large Scale (Coal based Power Plant)

Secondary- (STC Code): Red

**(iii) Production capacity- Units**

| Name of Product  | As per Consent      |
|------------------|---------------------|
| Power Generation | 4 X 600 MW (2400MW) |

**(iv) Year of establishment: (Commercial Operation Declaration)**

1<sup>st</sup> Unit-14.03.2014

2<sup>nd</sup> Unit-31.03.2014

3<sup>rd</sup> Unit-15.01.2015

4<sup>th</sup> Unit-12.12.2016

**(v) Date of the last Environmental Statement submitted**

Vide Letter No. **JPL/EMD/ES-TPP (4X600) MW/2017 /165, dated 20.09.2017**

**PART B**

**Water and Raw Material Consumption**

**1. Water consumption m<sup>3</sup>/ day**

| Sources Name  | Total Water consumption (m <sup>3</sup> / day) |
|---|--|
| 1. Process (DM Water Makeup)                          | 725.4  |
| 2. Cooling (Cooling Tower & Auxiliary Cooling Makeup) | 41900.1  |
| 3. Domestic (Potable & Service Water)                 | 764.6  |

| Name of Products | Process water (DM water makeup) consumption per unit of products |   |
|------------------|--|---|
|                  | During the previous financial year (2016-2017)                   | During the current financial year (2017-2018) |
| Power Generation | 52.401 ml/kwh  | 39.611 ml/kwh                                 |

**2. Raw material consumption**

| Name of raw Materials* | Name of Products | Consumption of raw material per unit of output |   |
|------------------------|------------------|--|---|
|                        |                  | During the previous financial year (2016-2017) | During the current financial year (2017-2018) |
| Coal                   | Power Generation | 0.787 kg/kwh                                   | 0.768 kg/kwh                                  |
| Oil                    | Power Generation | 0.352 ml/kwh                                   | 0.279 ml/kwh                                  |

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

### PART C

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

| Pollutants                 | Quantity of Pollutants discharged (mass/day) |       |       |       | Concentration of Pollutants discharged (mass/volume) |      |      |      | Percentage of variation from Prescribed standards with reasons. |                                 |
|----------------------------|--|-------|-------|-------|--|------|------|------|---|---------------------------------|
|                            | U#1  | U#2   | U#3   | U#4   | U#1  | U#2  | U#3  | U#4  |   |                                 |
| (a) Water*                 | Not Applicable                               |       |       |       | Not Applicable                                       |      |      |      | Not applicable  |                                 |
| (b) Air                    |  |       |       |       |  |      |      |      |   |                                 |
| Unit of measurement        | (t/day)                                      |       |       |       | (mg/Nm <sup>3</sup> )                                |      |      |      |   |                                 |
| i) Particulate Matter (PM) | Min  | 1.408 | 1.414 | 1.479 | 1.440  | 21.7 | 21.8 | 22.8 | 22.2  | Within the prescribed standards |
|                            | Max  | 2.692 | 2.751 | 2.614 | 2.491  | 41.5 | 42.4 | 40.3 | 38.4  |                                 |

\*Note – 100% effluent (Process and domestic) is recycled back for Ash slurry preparation, dust suppression & green belt development purpose and Zero discharge is being maintained.

### PART D HAZARDOUS WASTE

As specified under Hazardous Wastes Management, Handling & Trans Boundary Movement Rules, 2008, & as amended time to time.

| Hazardous Waste                      | Total Quantity (Kg)                            |   |
|--------------------------------------|--|---|
|                                      | During the previous financial year (2016-2017) | During the current financial year (2017-2018) |
| 1. From Process                      | Used /Spent Oil 5.1-59.03 MT<br>Not Applicable | Not Generated during this year                |
| 2. From Pollution Control Facilities |  |   |

**PART E  
SOLID WASTE:**

| Solid Waste  | Total Quantity (MT)                            |   |
|--|--|---|
|  | During the previous financial year (2016-2017) | During the current financial year (2017-2018) |
| a. From Process                                      | Approx. 329532.72 MT (Bottom Ash)              | Approx. 454546.91 MT (Bottom Ash)             |
| b. From Pollution Control Facilities (ESPs)          | 1318130.90 MT (Fly Ash)                        | 1818187.65 MT (Fly Ash)                       |
| c. Quantity recycled or re-utilized within the unit. | 528537.80MT                                    | 1749417.29 MT                                 |

**PART F**

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

**Characterization and disposal of wastes:**

**1- Solid Waste (Fly Ash)**

Characteristics of Solid waste: Fly ash

Reference: Anacon Laboratories, Report No:ALPL/18042017/07-3&4 , dt. 18.04.2017.

| Sr. No. | Test Parameters                                 | Measurement Unit | Results      |
|---------|---|------------------|--------------|
| 1       | Silica (as SiO <sub>2</sub> )                   | g/100g           | 59.14        |
| 2       | Aluminium (as Al <sub>2</sub> O <sub>3</sub> )  | g/100g           | 26.44        |
| 3       | Iron Oxide (as Fe <sub>2</sub> O <sub>3</sub> ) | g/100g           | 5.33         |
| 4       | Manganese (as Mn)                               | g/100g           | 0.04         |
| 8       | Cobalt (as Co)                                  | g/100g           | ND           |
| 9       | Lead (Pb)                                       | g/100g           | ND           |
| 10      | Cadmium (as Cd)                                 | g/100g           | ND           |
| 11      | Selenium (as Se)                                | g/100g           | ND           |
| 12      | Nickel (as Ni)                                  | g/100g           | ND           |
| 13      | Arsenic (as As)                                 | g/100g           | ND           |
| 14      | Mercury (as Hg)                                 | g/100g           | ND           |
| 15      | Sulphur Trioxide (as SO <sub>3</sub> )          | g/100g           | 1.06         |
| 16      | Zinc (as Zn)                                    | g/100g           | ND           |
| 17      | Copper (as Cu)                                  | g/100g           | ND           |
| 18      | Loss on Ignition (LOI)                          | g/100g           | 1.29         |
| 19      | pH (20% w/v, solution in water)                 | -                | 7.55 at 25°C |
| 20      | Chloride (as Cl)                                | g/100g           | Absent       |



**Disposal**-Fly ash Utilized in different purpose in this financial year is as mentioned below.

| Financial Year | Total fly Ash Generation (MT) | Supply to Brick Making Plant (MT) | Underground Hindalco Mines / Other's (MT) | Ash Dyke Raising (MT) | Mines filling for fire covering (MT) | Total fly Ash Utilization (MT) | Utilization (%) |
|----------------|-------------------------------|-----------------------------------|---|-----------------------|--------------------------------------|--------------------------------|-----------------|
| 2017-18        | 1818187                       | 52389                             | 31200.00                                  | 1517000               | 148828                               | 1749417                        | 96.22           |

### PART G

#### Impact of the pollution control measures taken on conservation of natural resources and consequently on the cost of production.

- JPL has taken every possible measure to mitigate the environmental impacts and also to conform to the applicable regulatory norms through implementing state of art technologies for environment protection. Air Pollution Control Devices (APCD) with benchmark efficiency (ESPs with 99.99% efficiency) have been installed. Gaseous analyzers for SO<sub>2</sub>, NO<sub>x</sub> are also installed at stacks. Plant is designed on 100% recirculation/ reuse of waste water from cooling tower blow down, boiler blow down and decanted water from ash dyke. Thus the concept of "Zero Discharge" is being maintained at all the time. The plant management is focused for effective utilization / proper management of the waste generated including fly ash.
- Adequate measures for air pollution control have been taken in and around plant area. Developments of green belt have been done in Plant premises, Ash dyke area, Mines area (till March 2015), Rabo dam & Catchment area and Colony area. Approx. 24.70 Lakh nos. of Saplings has been planted since year 2005 to March'2018.
- JPL has installed total 06 nos of Continuous Ambient Air Quality Monitoring Stations (CAAQMS) with an investment of approx. Rs.3.0 crores in & around power plant (3 core zones & 3 buffer zones). Four Stations have 06 nos. of online analyzers and another two Stations have 09 nos. of online analyzers, which records the Ambient Air Quality Monitoring (AAQM) Data round the clock. As per the notification issued by the Ministry of Environment & Forests (MoEF) on 16<sup>th</sup> November,2009 different environmental parameters are monitored at these stations by using specific measurement technique.

- Effluent generated from plant operation (Cooling Tower blow down, Boiler blow down, DM Plant neutralization pit discharge) is treated in effluent treatment plant & ash dyke decanted water is recirculated to ash handling system and both are used for ash slurry preparation.
- Domestic sewage is treated in 4 no. of Sewage Treatment Plants (STPs) installed 2 no. at plant premises, 1 no. at labor colony and 1 no. STP at colony. The treated water is used for horticulture purpose.
- Installed 2 TPD capacity biogas plant near Plant premises, where Kitchen waste generated from plant is being used to produce Methane gas for cooking in plant canteen. The company has invested an amount of approx. Rs.28 Lakhs.
- These measures have made a positive impact towards Environment Protection and conservation of natural resource such as Coal and Water.

**PART - H**

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

| <b>SL No.</b> | <b>Aspects</b>       | <b>Environmental Protection and mitigation measures</b>  |
|---------------|----------------------|--|
| 1.            | <b>Air Pollution</b> | <ul style="list-style-type: none"> <li>• Installation of ESPs of efficiency &gt;99.99% to limit the Particulate Matter (PM) below 50 mg/Nm<sup>3</sup>.</li> <li>• Construction of Stack of height 275 m for proper mixing and to reduce ground level concentrations.</li> <li>• Installation of Bag filters at fly ash silos &amp; Coal bunkers top.</li> <li>• The company has installed Continuous Emission Monitoring System (CEMS) in all stacks for Continuous Monitoring of Particulate Matter and Gaseous emission (SO<sub>2</sub> &amp; NO<sub>x</sub>) to track on-line real time emission data on the continuous basis with the data connectivity CPCB and CECB server.</li> <li>• Space provision for installation of FGD, if required in future.</li> <li>• Arrangement of dust suppression system at transfer points &amp; coal stock yard.</li> <li>• Installation of closed pneumatic conveying system for ash conveying.</li> <li>• Green belt development.</li> <li>• Maintaining sufficient water depth to control fugitive emissions from ash dyke and Good housekeeping is being maintained.</li> </ul> |

|    |                        |   |
|----|------------------------|---|
| 2. | <b>Water Pollution</b> | <ul style="list-style-type: none"> <li>• The generated oil bearing effluents &amp; other effluents from various streams is treated in Effluent treatment Plant (ETP) and the treated effluent is reused/recycled for ash slurry preparation, CHP dust suppression etc.</li> <li>• The company has maintained zero liquid discharge at all the time. Further, company has also installed Continuous Effluent Quality Monitoring System (EQMS) also it's connected to CPCB and CECB server.</li> <li>• Domestic sewage is treated in Sewage Treatment Plant.</li> <li>• Effluent from Ash dyke is treated and re-circulated /reused.</li> <li>• Construction of separate drains for storm water and effluents.</li> </ul> |
| 3. | <b>Noise Pollution</b> | <ul style="list-style-type: none"> <li>• Suitable vibration control measures for major equipment.</li> <li>• Proper enclosure of noise generating sources.</li> <li>• Turbines is provided with acoustic enclosure</li> <li>• Closed buildings for steam turbines.</li> <li>• A thick green belt development all along the boundary to control noise level.</li> </ul>  |
| 4. | <b>Solid waste</b>     | <ul style="list-style-type: none"> <li>• Generated fly is utilized for manufacturing of fly ash bricks, blocks, tiles etc., manufacturing of cement, back filling in abandoned mines, Dyke raising.</li> <li>• The bottom ash is disposed in ash dyke</li> </ul>  |

**PART I  
MISCLLANEOUS:**

**Any other particulars in respect of environmental protection and abatement of pollution.**

**Green Belt Development:** During the year 2017-2018 approx. 14070 nos. of saplings has been planted in and around the plant premises (4X250 MW & 4X600 MW TPP).

**House Keeping:** Maximum internal roads have been made pucca. Good housekeeping practices are being followed. Domestic House keeping like collection of domestic garbage (Colony & Plant), garden waste, civil debris is done in an efficient manner.

**Rain water Harvesting Pond:** A Rain Water Harvesting Pond (RWH) of capacity Approx. 35000 m<sup>3</sup> has been constructed within plant premises to store the rain water and recharge the Ground water table.

**Training & Development:** JPL has conducted following training programs to creating awareness among employees towards Environmental Management.

| Sl. No | Title of the Training  | Faculty           | Venue      |
|--------|--|-------------------|------------|
| 1      | Disaster Management  | External Trainer  | JPL Tamnar |
| 2      | Disaster Management  | External Trainer  | JPL Tamnar |
| 3      | Environment Norms  | Internal Training | JPL Tamnar |
| 4      | IMS Awareness program : About new version of IMS   | Internal Training | JPL Tamnar |
| 5      | Awareness program regarding IMS integrated management System   | Internal Training | JPL Tamnar |
| 6      | Environment Norms  | Internal Training | JPL Tamnar |
| 7      | Regarding IMS  | Internal Training | JPL Tamnar |
| 8      | Benefits of IMS  | Internal Training | JPL Tamnar |
| 9      | IMS Awareness program for safety Quality & Environment ISO-9001:2015 ISO 14001:2015 & OHSAS 18001:2007 | Internal Training | JPL Tamnar |
| 10     | IMS Awareness program for safety Quality & Environment ISO-9001:2015 ISO 14001:2015 & OHSAS 18001:2007 | Internal Training | JPL Tamnar |
| 11     | Disaster Management  | External Trainer  | JPL Tamnar |

**Awards:**

- ❖ Won the 16th Annual Genentech Award -2015 in "Gold Category" in Thermal Power sector in India.
- ❖ ENERGY EFFICIENCY AWARD 2015 in the Category: Power (>1000 MW) by CREDA at Raipur, Chhattisgarh, on 9th of August, 2015 in recognition and appreciation of our unrelenting efforts in Energy Efficiency during 2014-15.
- ❖ Jindal Power limited (JPL) has been ranked 5th with 2 Leaves Award in green rating project of thermal power plants in the country conducted by Centre for Science and Environment (CSE), New Delhi.
- ❖ Genentech Award -2014 in "Gold Category" in Thermal Power sector in India.
- ❖ Greentech CSR Award-2014
- ❖ Genentech Award -2013 in "Platinum Category" (Highest category) in Thermal Power sector in India.
- ❖ Greentech CSR Award-2013.
- ❖ Greentech Environment Gold Award-2012.
- ❖ Frost & Sullivan's Green Manufacturing Excellence Awards 2013.
- ❖ Won the par excellence & excellence award from QCFI for the Year 2013.
- ❖ Won the "First Prize" in the Annual Flower & Vegetable Show organized by TRL Krosaki Refractory's Ltd. for the Year 2013.

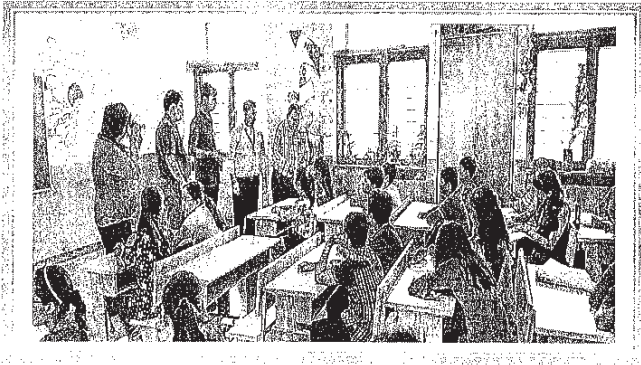
**PHOTOGRAPHS OF ENVIRONMENTAL AWARENESS PROGRAM:**



5<sup>th</sup> JUNE Rally at Colony



Mass Plantation at Colony



Poster and Slogan Competition at O.P. Jindal School



Poster and Slogan Competition at Govt. School



Jut Bag Distribution at Colony



Poster and Slogan Competition at O.P. Jindal School



Price Distribution



Drama by Employees

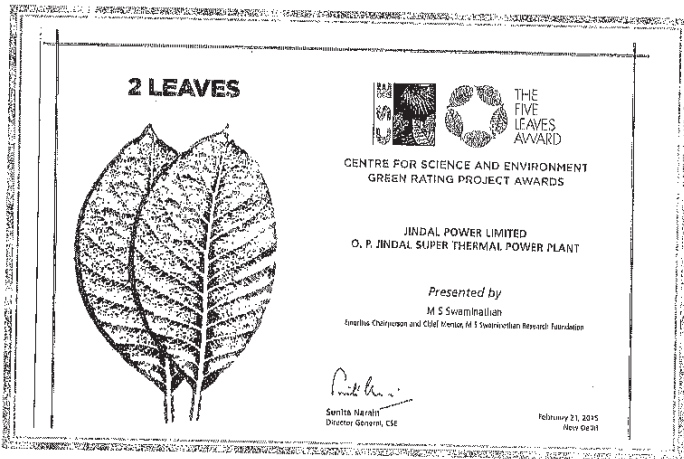


Environmental Oath taken by Employees

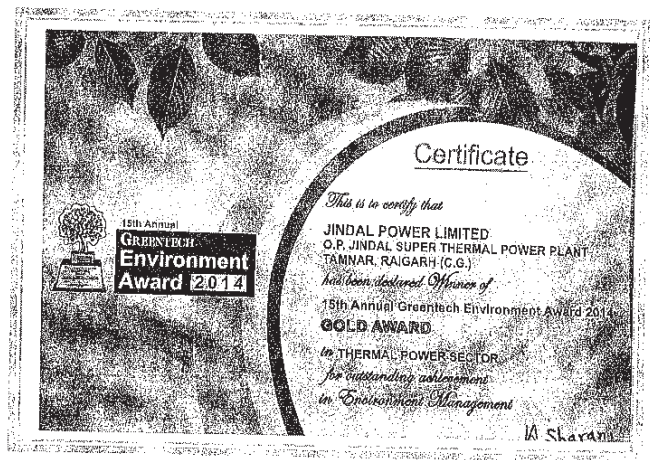


News Paper clipping

**CERTIFICATES & PHOTOGRAPHS OF ENVIRONMENT AWARDS RECEIVED**



Certificate of Green Rating Project Award



Certificate of Greentech Award