Respected Sir,

Sub: Environmental Statement of Rourkela Steel Plant & Captive Power Plant#1 for the year 2018-19

Please find enclosed herewith the Environment Statement of Rourkela Steel Plant including Captive Power Plant for the year 2018-19 for your kind information and necessary action.

Thanking you sir,

With kind regards,

Encl: As above

To:
The Member Secretary,
State Pollution Control Board,
A/118, Nilakantha Nagar,
Unit-VIII,
Bhubaneswar – 1
FORM – V

Environmental Statement
for the financial year ending 31\textsuperscript{st} March, 2019

Part – A

I. Name and address of the owner/occupier of the industry operation or process: Sri G Banerjee
   Executive Director (Works)
   M/s SAIL – Rourkela Steel Plant
   Rourkela.

II. Industry Category: Primary & Secondary

III. Production Capacity: 4.2 MTPA Crude Steel &
   100 MW Captive Power Generations

IV. Year of Establishment: 1959

V. Date of last Env. Statement submitted: 20/09/2018.
### Part - B

**Water and Raw Material Consumption**

1. **Water & Consumption:**

<table>
<thead>
<tr>
<th>Year</th>
<th>2017-18</th>
<th>2018-19</th>
</tr>
</thead>
<tbody>
<tr>
<td>Water Consumption</td>
<td>45243 m³/day</td>
<td>49164 m³/day</td>
</tr>
<tr>
<td>Process</td>
<td>1008 m³/day</td>
<td>1052 m³/day</td>
</tr>
<tr>
<td>Cooling</td>
<td>28479 m³/day</td>
<td>32356 m³/day</td>
</tr>
<tr>
<td>Domestic</td>
<td>15756 m³/day</td>
<td>15756 m³/day</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Name of Product</th>
<th>During the previous financial year</th>
<th>During the current financial year</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>2017-18</td>
<td>2018-19</td>
</tr>
<tr>
<td>Crude Steel</td>
<td>3.72 m³/Tonne of Crude Steel</td>
<td>3.66 m³/Tonne of Crude Steel</td>
</tr>
<tr>
<td>Power Generation</td>
<td>7.07 m³/Tonne of Steam</td>
<td>5.98 m³/Tonne of Steam</td>
</tr>
</tbody>
</table>

2. **Raw Material Consumption:**

<table>
<thead>
<tr>
<th>Name of Raw Material</th>
<th>Name of Product</th>
<th>Consumption of Raw Material per unit of output</th>
<th>During the previous financial year</th>
<th>During the current financial year</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>2017-18</td>
<td>2018-19</td>
</tr>
<tr>
<td>Iron Ore</td>
<td>Crude Steel</td>
<td>1.70 T/TCS</td>
<td>1.770 T/TCS</td>
<td></td>
</tr>
<tr>
<td>Coal</td>
<td></td>
<td>0.898 T/TCS</td>
<td>0.802 T/TCS</td>
<td></td>
</tr>
<tr>
<td>Lime Stone</td>
<td></td>
<td>0.256 T/TCS</td>
<td>0.310 T/TCS</td>
<td></td>
</tr>
<tr>
<td>Dolomite</td>
<td></td>
<td>0.266 T/TCS</td>
<td>0.222 T/TCS</td>
<td></td>
</tr>
<tr>
<td>Boiler Coal</td>
<td>Steam generated from Captive Power Plant</td>
<td>0.067 T/T of Steam</td>
<td>0.057 T/T of Steam</td>
<td></td>
</tr>
<tr>
<td>Mixed Gas</td>
<td></td>
<td>48.58 Nm³/ T of Steam</td>
<td>64.97 Nm³/ T of Steam</td>
<td></td>
</tr>
<tr>
<td>Blast Furnace Gas</td>
<td></td>
<td>345.77 Nm³/ T of Steam</td>
<td>276.58 Nm³/ T of Steam</td>
<td></td>
</tr>
<tr>
<td>Furnace Oil</td>
<td></td>
<td>0.104 Kg/ T of Steam</td>
<td>0.095 Kg/ T of Steam</td>
<td></td>
</tr>
</tbody>
</table>
Part – C

Pollution discharge to Environment/unit of output (Parameter as specified in the consent order)

(a) Total Water pollution load discharged from Plant:

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Qty. of pollutant discharged (Kg/day)</th>
<th>Concentrations of pollutants in discharges (mass/volume)</th>
<th>Norm</th>
<th>% of variation from prescribed standards(-VE)</th>
</tr>
</thead>
<tbody>
<tr>
<td>SS</td>
<td>586.67</td>
<td>29 mg/lit</td>
<td>100</td>
<td>-71.0%</td>
</tr>
<tr>
<td>TDS</td>
<td>4288.73</td>
<td>287 mg/lit</td>
<td>2100</td>
<td>-89.90%</td>
</tr>
<tr>
<td>BOD</td>
<td>242.76</td>
<td>14.6 mg/lit</td>
<td>30</td>
<td>-60%</td>
</tr>
<tr>
<td>COD</td>
<td>768.73</td>
<td>44.5 mg/lit</td>
<td>250</td>
<td>-84.80%</td>
</tr>
<tr>
<td>Oil &amp; grease</td>
<td>78.90</td>
<td>3.1 mg/lit</td>
<td>10</td>
<td>-61%</td>
</tr>
<tr>
<td>Iron</td>
<td>54.62</td>
<td>1.9 mg/lit</td>
<td>3.0</td>
<td>-10%</td>
</tr>
<tr>
<td>Total Chromium</td>
<td>0.06</td>
<td>0.01 mg/lit</td>
<td>2.0</td>
<td>-99.86%</td>
</tr>
</tbody>
</table>

(b) Total Air Pollution load discharged from all major stacks:

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Qty. of pollutant discharged (Kg/day)</th>
<th>Concentrations of pollutants in discharges (mass/volume)</th>
<th>% of variation from prescribed standards with reasons</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stack emission load (Particulate Matter)</td>
<td>7218.93</td>
<td>38.83 mg/Nm3</td>
<td>-22.34 %</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>• The norms for stack emissions are different from different shops ranging from 50 mg/Nm3 (Coke Oven Stacks) to 150 mg/Nm3 (Sintering Plant stacks).</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>• For calculation purpose the stringent norms i.e., 50 is considered.</td>
</tr>
</tbody>
</table>
Part – D

a) From Process :

<table>
<thead>
<tr>
<th>SN. as per HW Authorization order</th>
<th>Hazardous Waste</th>
<th>Total Quantity (Ton/Year)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>During the current year 2017-18</td>
<td>During the previous year 2018-19</td>
</tr>
<tr>
<td>1</td>
<td>Tar Residue from Gas Trap &amp; Scale</td>
<td>1.0 Ton/Yr</td>
</tr>
<tr>
<td>2</td>
<td>Used Oil</td>
<td>40.0 Ton/Yr</td>
</tr>
<tr>
<td>4</td>
<td>Zink Dross</td>
<td>484.0 Ton/Yr</td>
</tr>
<tr>
<td>5</td>
<td>Pickling Tank Sludge</td>
<td>40.0 Ton/Yr</td>
</tr>
<tr>
<td>6</td>
<td>Tin Plating Line Sludge</td>
<td>1.0 Ton/Yr</td>
</tr>
<tr>
<td>7</td>
<td>Acid Tar</td>
<td>1.0 Ton/Yr</td>
</tr>
<tr>
<td>8</td>
<td>Decanter Tar Sludge</td>
<td>60.0 Ton/Yr</td>
</tr>
<tr>
<td>10</td>
<td>Acid Storage Tank Sludge</td>
<td>1.0 Ton/Yr</td>
</tr>
<tr>
<td>11</td>
<td>V2O5 Catalyst</td>
<td>Nil</td>
</tr>
<tr>
<td>12</td>
<td>Cleaning Solvent Sludge</td>
<td>0.50 Ton/Yr</td>
</tr>
<tr>
<td>15</td>
<td>Sulphur Muck</td>
<td>Nil</td>
</tr>
<tr>
<td>16a)</td>
<td>Damaged Refractory lining &amp; residue from furnace</td>
<td>Nil</td>
</tr>
<tr>
<td>17a)</td>
<td>Tin Ash</td>
<td>Nil</td>
</tr>
<tr>
<td>18a)</td>
<td>Dichromate Sludge</td>
<td>Nil</td>
</tr>
<tr>
<td>19a)</td>
<td>Non Ferrous Waste</td>
<td>0.50 Ton/Yr</td>
</tr>
<tr>
<td>23a)</td>
<td>Grinding Waste</td>
<td>0.10 Ton/Yr</td>
</tr>
<tr>
<td>24a)</td>
<td>Waste Asbestos</td>
<td>100 kg/Yr.</td>
</tr>
<tr>
<td>26a)</td>
<td>GCP sludge of LD Furnaces</td>
<td>57,926 T/Yr.</td>
</tr>
</tbody>
</table>

b) From Pollution Control Facilities:

<table>
<thead>
<tr>
<th>SN</th>
<th>Hazardous Waste</th>
<th>Total Quantity (Ton/Year)</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>Oily Sludge/Waste contaminated with oil</td>
<td>448 Ton/Yr</td>
</tr>
<tr>
<td>9</td>
<td>Catch Pit Sludge/Tarry waste</td>
<td>60.0 Ton/Yr</td>
</tr>
<tr>
<td>13</td>
<td>DM Plant Neutralization Sludge</td>
<td>5.0 Ton/Yr</td>
</tr>
<tr>
<td>14</td>
<td>Chemical sludge from Waste Water Treatment</td>
<td>120 Ton/Yr</td>
</tr>
<tr>
<td>20</td>
<td>Bag Filter Dust</td>
<td>1.50 Ton/Yr</td>
</tr>
<tr>
<td>21</td>
<td>Rejected Sand</td>
<td>15.0 Ton/Yr</td>
</tr>
<tr>
<td>22</td>
<td>Sand Blasting Bag filter Dust</td>
<td>1.0 Ton/Yr</td>
</tr>
<tr>
<td>25</td>
<td>Flue gas residue</td>
<td>22,017 Ton/Yr</td>
</tr>
</tbody>
</table>
# Part – E

## Solid Wastes

<table>
<thead>
<tr>
<th>SN.</th>
<th>Solid Waste</th>
<th>Total Quantity Ton/Yr</th>
<th>During current year 2017-18</th>
<th>During previous year 2018-19</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>Generation from Process</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>a</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>Blast furnace slag</td>
<td>10,97,086</td>
<td>11,24,893</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>SMS slag</td>
<td>5,27,547</td>
<td>5,98,557</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Mill scale</td>
<td>51,565</td>
<td>54,073</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Acetylene sludge</td>
<td>249</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Bottom Ash/Cinder</td>
<td>53,764</td>
<td>42,107</td>
<td></td>
</tr>
<tr>
<td></td>
<td>b</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>SMS sludge</td>
<td>57,926</td>
<td>65,878</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>Fly Ash</td>
<td>59,204</td>
<td>76,915</td>
<td></td>
</tr>
<tr>
<td></td>
<td>c</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Mill scale</td>
<td>51,625</td>
<td>54,073</td>
<td></td>
</tr>
<tr>
<td></td>
<td>SMS slag</td>
<td>1,08,398</td>
<td>1,14,215</td>
<td></td>
</tr>
<tr>
<td></td>
<td>SMS sludge</td>
<td>6,290</td>
<td>6,950</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Fly Ash</td>
<td>57,915</td>
<td>76,915</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Bottom Ash/Cinder</td>
<td>53,764</td>
<td>42,107</td>
<td></td>
</tr>
<tr>
<td></td>
<td>d</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>BF slag (granulated)</td>
<td>10,97,086</td>
<td>11,24,893</td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>Rejected bricks</td>
<td>2,357</td>
<td>807</td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>Acetylene sludge</td>
<td>249</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>SMS sludge</td>
<td>12,808</td>
<td>14,392</td>
<td></td>
</tr>
<tr>
<td>12</td>
<td>SMS slag</td>
<td>1,246</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>13</td>
<td>Fly Ash (Given free of cost)</td>
<td>1289</td>
<td>145.06</td>
<td></td>
</tr>
<tr>
<td></td>
<td>e</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>14</td>
<td>BF slag (Air cooled)</td>
<td>Nil</td>
<td>Nil</td>
<td></td>
</tr>
<tr>
<td>15</td>
<td>SMS slag</td>
<td>4,17,903</td>
<td>4,84,342</td>
<td></td>
</tr>
<tr>
<td>16</td>
<td>Rejected bricks</td>
<td>0</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>17</td>
<td>Fly Ash</td>
<td>Nil</td>
<td>Nil</td>
<td></td>
</tr>
<tr>
<td>18</td>
<td>Bottom Ash/Cinder</td>
<td>Nil</td>
<td>Nil</td>
<td></td>
</tr>
</tbody>
</table>
Please specify the characterizations (in terms of composition of quantum) of hazardous as well as solid wastes and indicated disposal practice adopted for both these categories of wastes.

<table>
<thead>
<tr>
<th>SN.</th>
<th>Hazardous Waste</th>
<th>Composition</th>
<th>Quantum</th>
<th>Disposal practices</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Tar Residue from Gas Trap &amp; Scale</td>
<td></td>
<td></td>
<td>Disposed in Hazardous waste pit.</td>
</tr>
<tr>
<td>2</td>
<td>Used Oil</td>
<td></td>
<td></td>
<td>Sold to outside agencies having registration with MOEF/SPCB</td>
</tr>
<tr>
<td>3</td>
<td>Oily Sludge/Waste contaminated with oil</td>
<td></td>
<td></td>
<td>Recycled/reused inside RSP/Kept in impervious pit</td>
</tr>
<tr>
<td>4</td>
<td>Zink Dross</td>
<td></td>
<td></td>
<td>Sold to outside agencies having registration with MOEF/SPCB</td>
</tr>
<tr>
<td>5</td>
<td>Pickling Tank Sludge</td>
<td></td>
<td></td>
<td>Disposed in Hazardous waste pit.</td>
</tr>
<tr>
<td>6</td>
<td>Tin Plating Line Sludge</td>
<td></td>
<td></td>
<td>Disposed in Hazardous waste pit.</td>
</tr>
<tr>
<td>7</td>
<td>Acid Tar</td>
<td></td>
<td></td>
<td>Disposed in Hazardous waste pit.</td>
</tr>
<tr>
<td>8</td>
<td>Decanter Tar Sludge</td>
<td></td>
<td></td>
<td>Recycled/Reused inside RSP</td>
</tr>
<tr>
<td>9</td>
<td>Catch Pit Sludge/Tarry waste</td>
<td></td>
<td></td>
<td>Disposed in Hazardous waste pit.</td>
</tr>
<tr>
<td>10</td>
<td>Acid Storage Tank Sludge</td>
<td></td>
<td></td>
<td>Disposed in Hazardous waste pit.</td>
</tr>
<tr>
<td>11</td>
<td>V2O5 Catalyst</td>
<td></td>
<td></td>
<td>Disposed in Hazardous waste pit.</td>
</tr>
<tr>
<td>12</td>
<td>Cleaning Solvent Sludge</td>
<td></td>
<td></td>
<td>Disposed in Hazardous waste pit.</td>
</tr>
<tr>
<td>13</td>
<td>DM Plant Neutralization Sludge</td>
<td></td>
<td></td>
<td>Disposed in Hazardous waste pit.</td>
</tr>
<tr>
<td>14</td>
<td>Chemical sludge from Waste Water Treatment</td>
<td></td>
<td></td>
<td>Disposed in Hazardous waste pit.</td>
</tr>
<tr>
<td>15</td>
<td>Sulphur Muck</td>
<td></td>
<td></td>
<td>Disposed in Hazardous waste pit.</td>
</tr>
<tr>
<td>16</td>
<td>Damaged Refractory lining &amp; residue from furnace</td>
<td></td>
<td></td>
<td>Disposed in Hazardous waste pit.</td>
</tr>
<tr>
<td>17</td>
<td>Tin Ash</td>
<td></td>
<td></td>
<td>Disposed in Hazardous waste pit.</td>
</tr>
<tr>
<td>18</td>
<td>Dichromate Sludge</td>
<td></td>
<td></td>
<td>Disposed in Hazardous waste pit.</td>
</tr>
<tr>
<td>19</td>
<td>Non Ferrous Waste</td>
<td></td>
<td></td>
<td>Disposed in Hazardous waste pit.</td>
</tr>
<tr>
<td>20</td>
<td>Bag Filter Dust</td>
<td></td>
<td></td>
<td>Disposed in Hazardous waste pit.</td>
</tr>
<tr>
<td>21</td>
<td>Rejected Sand</td>
<td></td>
<td></td>
<td>Disposed in Hazardous waste pit.</td>
</tr>
<tr>
<td>22</td>
<td>Sand Blasting Bag filter Dust</td>
<td></td>
<td></td>
<td>Disposed in Hazardous waste pit.</td>
</tr>
<tr>
<td>23</td>
<td>Grinding Waste</td>
<td></td>
<td></td>
<td>Disposed in Hazardous waste pit.</td>
</tr>
<tr>
<td>24</td>
<td>Waste Asbestos</td>
<td></td>
<td></td>
<td>Disposed in Hazardous waste pit.</td>
</tr>
<tr>
<td>25</td>
<td>Flue gas residue</td>
<td></td>
<td></td>
<td>Recycle in Sinter Plant through OBBP</td>
</tr>
</tbody>
</table>
## Solid Waste:

<table>
<thead>
<tr>
<th>SN.</th>
<th>Solid Waste</th>
<th>Quantity of Generation (Tons)</th>
<th>Composition</th>
<th>Disposal methodology</th>
</tr>
</thead>
<tbody>
<tr>
<td>1)</td>
<td>BFc. Slag</td>
<td>11,24,893</td>
<td>SiO₂ – 17.8%; SiO₂ – 34.6%; CaO – 9.7%; MgO – 0.58%; FeO – 0.12%; MnO₅ – 0.49%</td>
<td>Sold to cement manufacturers.</td>
</tr>
<tr>
<td>2)</td>
<td>SMS Slag</td>
<td>5,98,557</td>
<td>FeO – 23.2%; SiO₂ – 11.7%; CaO – 46.3%; MnO – 0.7%; Al₂O₃ – 1.4%; P₂O₅ – 5.7%; TiO₂ – 2.6%</td>
<td>Recycled back to process for steel making, used as pavement material, rail ballast etc.</td>
</tr>
<tr>
<td>3)</td>
<td>Mill Scale</td>
<td>54,073</td>
<td>FeO ~ 98%</td>
<td>Recycled back to steel making process</td>
</tr>
<tr>
<td>4)</td>
<td>Acetylene Sludge</td>
<td>0</td>
<td>CaO ~ 65%</td>
<td>Sold to external agencies for use for white washing.</td>
</tr>
<tr>
<td>5)</td>
<td>SMS Sludge</td>
<td>65,878</td>
<td>Total Iron – 66%; SiO₂ – 6.1%; Al₂O₃ – 0.6%; CaO – 18%; P₂O₅ – 6%; MnO – 0.26%; TiO₂ – 0.8%</td>
<td>Sold to external agencies for making pellets.</td>
</tr>
<tr>
<td>6)</td>
<td>Fly Ash, Bottom Ash &amp; cinder</td>
<td>1,19,022</td>
<td>SiO₂ : 60 – 64%; Al₂O₃ : 12 – 23%; TiO₂ : 1.5%; Fe₂O₃ : 8 – 19%; Na₂O : 0.1 – 0.2%; MgO : 1-3.5%</td>
<td>Given to fly ash brick manufactures free of cost, used for reclamation of low lying areas and used for making embankments.</td>
</tr>
</tbody>
</table>

### Part – G

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

<table>
<thead>
<tr>
<th>Department / Measure</th>
<th>Level of Pollution</th>
<th>Remark</th>
<th>Cost (Rs. in Lakhs)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Development of two no. of oxidation ponds for treatment of waste water</td>
<td>No facility earlier</td>
<td>Saving electric power</td>
<td>~ 650 Lakhs</td>
</tr>
<tr>
<td>Development of 16 no. of Rain Water Harvesting Systems in Steel Township</td>
<td>No facility earlier</td>
<td>Saving water</td>
<td>~ 36 Lakhs</td>
</tr>
</tbody>
</table>
Part – H

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

- Installation of 29 no. of online continuous emission monitoring systems for continuous monitoring of dust in the stack emissions and their uplinking with the servers of SPCB & CPCB.
- Mechanical Wheel Washing System inside plant.

PART – I

Any other particulars for improving the quality of the environment.

Tree Plantation :

<table>
<thead>
<tr>
<th>Description</th>
<th>2017-18</th>
<th>2018-19</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tree plantation in and around Rourkela Steel Plant</td>
<td>61,285</td>
<td>1,02,870</td>
</tr>
<tr>
<td>Free distribution of saplings in Educational institutions and peripheral villages</td>
<td>1 lakh</td>
<td>1 lakh</td>
</tr>
</tbody>
</table>