**ODISHA POWER GENERATION CORPORATION LTD.**
(A Government Company of the State of Odisha)
CIN: U401040R1984SG001429

**Ib Thermal Power Station**
**Banharpali, Dist.: Jharsuguda, Odisha - 768 234, India**
Plant Manager : (+916645) 289266, Fax: (+916645) 222-230
Factory Manager : (+916645) 222224, Fax: (+916645) 222-230

OPGC
*Power For Progress*

Letter No. ITPS/5986/WE
September 27, 2022

To
**The Member Secretary**
State Pollution Control Board, Odisha
Paribesh Bhawan, A/118
Nilakantha Nagar, Unit-VIII
Bhubaneswar-751012.

Sub: **Environmental Statement for ITPS (2x210MW & 2X660 MW) for the period from 1st April 2021 to 31st March 2022.**

Sir,

Enclosed please find herewith the Annual Environmental Statement in (Form-V) for Ib Thermal Power Station (2x210MW & 2X660 MW), Banharpali, Jharsuguda for the period from 1st April 2021 to 31st March 2022 for kind perusal.

Thanking you

Sincerely yours,

**Manas Ranjan Rout**
Director (Operations) & Occupier

Encl: Environmental Statement

Copy to-
Regional Officer, State Pollution Control Board, Plot No. 370/5971, At - Babubagicha (Cox Colony), St. Marry Hospital Road, Post – Industrial Estate, Jharsuguda for kind information.

# ENVIRONMENTAL STATEMENT

## Odisha Power Generation Corporation Ltd
## Ib Thermal Power Station

Banharpali, Jharsuguda

(2 x 210 MW)

**PERIOD FROM 1st APRIL 2021 TO 31st MARCH 2022**

**(FORM – V)**

**(See Rule 14)**

**Environmental Statement Report for the Financial Year ending the 31st March, 2022.**

**PART – A**

| | | |
|---|---|---|
| i. | Name and address of the Owner/**Occupier of the Industry** | : **Mr. Manas Ranjan Rout**<br>Odisha Power Generation Corp. Ltd.<br>Ib Thermal Power Station<br>Banharpali, Jharsuguda<br>Pin Code- 768234<br>Site Office-Ph.06645-222220, Fax. 222230<br>Corp. Office- 06742303754, Fax. 2303755 |
| ii. | Production Capacity | : 420 MW (2X210 MW) |
| iii. | Year of Establishment | : Unit#1-21.12.1994<br>: Unit#2-20.06.1996 |
| iv. | Date of last Environment Statement submitted | : 22.09.2021 |
| v. | Industry category | : Thermal Power Plant |

## PART – B

## (Water and Raw Material Consumption)

**(All values indicate Annual consumption) in $m^3$/day**

| Sl. | Description | **2020-2021** | **2021-2022** |
|---|---|---|---|
| (I) | Gross Energy Generation (MU/Year): | 2609.840 | 2951.802 |
| (ii) | Total Water consumption (m3/day): | 24223 | 23777 |
| (iii) | Ash disposal make up, Process NEBD: | 4457 | 3907 |
| (iv) | Cooling, Spraying, Boiler Feed: | 19512 | 19585 |
| (v) | Domestic*: (Excluding Township) | 204 | 234 |
| (vi) | Process, EBD | 50 | 50 |

| **Sl No** | **Name of the product** | **Process Water Consumption per Unit of Product Output** | |
|---|---|---|---|
| | | **2020-21** | **2021-22** |
| 01 | Electricity | 3.38 Kl/MWH | 2.93 Kl/MWH |

*NB: The Sp. Water consumption was higher than previous due to lesser generation.*

| **Name of Raw Material** | **Name of the product** | **Consumption of Raw Material unit of output** | | | |
|---|---|---|---|---|---|
| | | **2020-21** | | **2021-22** | |
| Coal | Electricity | Total Consumption | 2468005 MT | Total Consumption | 2595424 MT |
| | | Specific Consumption | 0.945 Kg/KWH | Specific Consumption | 0.879 Kg/KWH |
| Start-up Fuel Oil (LDO) | Electricity | Total Consumption | 1383.538 KL | Total Consumption | 1186.913 KL |
| | | Specific Consumption | 0.530 ml/KWH | Specific Consumption | 0.402 ml/KWH |

## PART – C
## Pollution discharged to Environment and Pollution Level

| PERIOD- April 2021 TO March 2022 | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| **STACK EMISSION** | | | | | | | | |
| **PARAMETER** | **NORM** | **STACK 1** | | | **NORM** | **STACK 2** | | |
| | | **MAX.** | **MIN.** | **AVE.** | | **MAX.** | **MIN.** | **AVE.** |
| PM ($mg/Nm^3$) | **100** | 93 | 76 | 84 | **100** | 93 | 76 | 86 |
| $CO_2$ (%) | **NA** | 18.8 | 6.8 | 9 | **NA** | 8.4 | 7.1 | 7.8 |
| CO ($mg/Nm^3$) | **NA** | 12.6 | 9.3 | 10.8 | **NA** | 11.3 | 9.2 | 9.8 |
| $SO_2$ ($mg/Nm^3$) | **600** | 1465 | 1169 | 1316 | **600** | 1496 | 1184 | 1289 |
| $NO_X$ ($mg/Nm^3$) | **600** | 236 | 186 | 211 | **600** | 236 | 175 | 203 |

| **AMBIENT AIR QUALITY** | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| **PARAMETER** | **NORM** | **INDUSTRIAL** | | | **NORM** | **RESIDENTIAL** | | |
| | | **MAX.** | **MIN.** | **AVE.** | | **MAX.** | **MIN.** | **AVE.** |
| $PM_{10}$ ug/m3 | **100** | 93 | 18 | 64 | **100** | 88 | 16 | 59 |
| PM $_{2.5}$ ug/m3 | **60** | 54 | 12 | 36 | **60** | 52 | 10 | 33 |
| $SO_2$ (ug/m3) | **80** | 20 | 7 | 14 | **80** | 15 | 8 | 10 |
| $NO_x$ (ug/m3) | **80** | 32 | 13 | 23 | **80** | 23 | 15 | 20 |

| **STP WATER QUALITY** | | | | | **AMBIENT NOISE in dB(A)** | | | |
|---|---|---|---|---|---|---|---|---|
| **PARAMETER** | **NORM** | **MAX** | **MIN** | **AVE.** | **INDUSTRIAL** | | **RESIDENTIAL** | |
| pH | **6.5 – 9.0** | 7.53 | 7.25 | 7.41 | **MAX.** | **MIN.** | **MAX.** | **MIN.** |
| TSS, mg/ltr | **100** | 38 | 21 | 30 | **DAY TIME** | | | |
| BOD(3 days at $27^0$C), mg/ltr | **30** | 8 | 6.5 | 6.9 | NORM | | | |
| COD, mg/ltr | **250** | 34 | 20 | 26 | **75** | | **55** | |
| Total Nitrogen(as N) | **10** | 5.7 | 3.7 | 4.5 | 73 | 65 | 48 | 39 |
| Ammonical Nitrogen(as $NH_3$-N) | **50** | 2.6 | 1.2 | 2 | **NIGHT TIME** | | | |
| Total coliform | **--** | 260 | 140 | 186 | NORM | | | |
| Fecal coliform | **<1000** | 84 | 47 | 59 | **70** | | **45** | |
| | | | | | 69 | 63 | 40 | 34 |

OPGC has installed continuous emission monitoring system for both the stacks, four continuous ambient air quality monitoring stations and one continuous effluent monitoring station for round the clock monitoring and control of emission/pollution parameters. These stations are connected to SPCB & CPCB servers through real time data acquisition and transmission facility. The plant has achieved zero effluent discharge from December'18 onwards and till December'18 only 1 % effluent had been discharged after meeting the norms.

## PART – D
## HAZARDOUS WASTES

**(As specified under Hazardous wastes/management & Handling Rules, 2008)**

**A. From Process:**

| Hazardous Waste Types | 2020-21 | | | | 2021-22 | | | |
|---|---|---|---|---|---|---|---|---|
| | Opening stock | Generation | Sold/ Disposed | Balance | Opening stock | Generation | Sold/ Disposed | Balance |
| Used oil or Spent oil<br>a.Used Lub. Oil : KL<br>b.Used Grease: MT<br>c.Used Transformer Oil :KL | **68.625 KL**<br>a. 11.25 KL<br>b. 57 MT<br>c. 0.375 KL | **61.672 KL**<br>a. 6.672 KL<br>b. 55 MT<br>c. Nil | Nil | **130.297 KL** | **130.297 KL**<br>a. 17.922 KL<br>b. 112 MT<br>c. 0.375 KL | **25.568 KL**<br>a. 20.258 KL<br>b. 5.31 MT<br>c. Nil | **14.7** | **141.165 KL** |
| Waste or Residue containing oil* | 0.6 | 0.5 MT (oily cotton waste) | Nil | 1.1 MT | 1.1MT | 0.5 MT (oily cotton waste) | Nil | 1.6 MT |
| Oily sludge during cleaning: KL | 0 | 0 | 0 | Nil | 0 | 0 | 0 | Nil |
| Spent Resin, MT | 7.6 MT | 0 | 0 | 7.6 MT | 7.6 MT | 0 | 0 | 7.6 MT |
| Discarded Container a.oil drums (Nos ) Empty Chemical Jar, Nosb b. CW chemical | 0 | **Used Oil Drum** b.05 Nos **Chemical Jerkin containing Hydrazine.** c. 300 Nos **Chemical Jerkin containing CW Chemicals –** d.40 Nos **Ammonia Jerkins for boilers** | Disposed back to supplier | Nil | a. U Oil Drums-702 Chemical Jerkin-Nil | a. 101 **Used Oil Drum** b.05 Nos **Chemical Jerkin containing Hydrazine.** c. 300 Nos **Chemical Jerkin containing CW Chemicals –** d.40 Nos **Ammonia Jerkins for boilers** | a. 74 **Note - Chemical Jerkins Disposed back to original supplier on by back basis** | a. 729 Nos |
| Used batteries(Nos.) | 136 Nos | 130 Nos | 26 Nos | 292 | 292 Nos | 255 Nos | 221 Nos | 34 |

**B. From Pollution Control Facilities:** No generation

## PART – E

## SOLID WASTES

### A. Ash:

| Solid Wastes (Ash): | Total Quantity (MT) | |
|---|---|---|
| | 2020-21 | 2021-22 |
| From Process | 219301 MT (Bottom Ash) | 232973 MT (Bottom Ash) |
| From Pollution Control Facilities | 877084 MT (Fly Ash) | 931891 MT (Fly Ash) |
| Quantity Utilized | 730990 MT | 403200 MT |
| Disposed in Ash Pond | 365395 MT | 761664 MT |

**Reasons for variation from the target**

1. Since the plant is situated in a remote location (pit head power plant located in rural area) there is very limited scope of ash utilization in brick manufacturing. More ever utilization in this particular area cannot exceed more than 2% to 3%.

2. Big stone quarry or low lands are not available in the locality.

3. Export of ash is not feasible since the site is located at a distance of 500 Km from the nearest port. Transportation from site to nearest port through rail or any other means is not feasible.

4. Major road construction activities are taking place near Jharsuguda (Expansion of Sambalpur Rourkela Sate Highway No-10 & Expansion of Sambalpur National Highway No-42). The ash demands for these activities are met by other thermal power plants, close to the road construction areas. However, we have supplied around 8830 MT of ash in the last financial year for construction of road.

5. No scope available in major ash utilization area i.e. Cement Plant use for production of PPC cement. Only one cement plant is available in the vicinity i.e. M/s Ultratech Cement Ltd. M/s Ultratech off takes entire quantity of ash for cement manufacturing from its sister concern i.e. from M/s Aditya Aluminium (Lapanga).

6. Considering OPGC plant's location (Pit Head), mine void back filling of ash is the only means of utilization by which OPGC can achieve 100% ash utilization. The steps so far are as follows.

i. There was progress on mine void allotment in the year 2006. With the support from Regional Office, MoEF and SPCB, MCL has consented to allot Lilari mine void to OPGC. Subsequently, in July 2007, MCL accorded consent for taking up EIA & Feasibility Study for back filling in the void based on which OPGC engaged CIMFR to conduct the studies in October 2007. During the course of the EIA study, the consent given to OPGC was withdrawn by MCL unilaterally vide their letter No MCL-3185/13.02.2008 stating "the life of Lilari Mine is extended with ten more years". Thereafter, OPGC has been pursuing MCL time and again involving regulatory as well as Govt. to reconsider the withdrawal or consider allotting any other mine void near to OPGC site but there has been no progress.

ii. State Pollution Control Board, Odisha made a proceeding on 05.06.10 for backfilling of OPGC ash in BOCM Mine void of MCL as an alternative solution against allotment of Lilari Mine void but no initiative has been taken so far from MCL side.

iii. MCL has also been directed repeatedly by OPGC Chairman & Principal Secretary, Energy, Govt of Odisha, managing Director and Director (Operation) but no positive response has so far been received from MCL.

iv. In a meeting held on 24.01.2011 with Principal secretary Energy, Govt. of Odisha, CMD, MCL has given consent to give principal approval for back filling BOCM mind void but the same has not been done, so far.

v. In response to the letter of Director (Operation), OPGC, dtd.24.08.2013 on the subject, Director (Tech. P&P), MCL negated the request on the ground of BOCM expansion towards dip slide and no scope to back fill ash in running mine even though OPGC proposed for a partition bund to separate the void space from active mine for ash back filling.

vi. In a high-level meeting held on 13.12.2013 under the Chairmanship of Chief Secretary, GoO, directions for allotment of BOCM mine void to OPGCL were issued to MCL on 03.04.2014 by Dept. of Environment & Forest, GoO. The said directions were for taking expeditious steps on this front. However, there has not been any progress as yet.

vii. In a letter dated 10.08.2020 OPGC had again requested Director Technical for allotment of BOCM mine void, however the request was turned down stating various technical causes.

viii. In a letter dated 14.06.2021 OPGC had again requested Director Technical for allotment of BOCM mine void, however the request was turned down vide MCL letter No253H, dated 07.08.2021 stating the reason of excavation of bottom seam and integration of Lakhanpur, Belpahar & Lilari mines.

****However, OPGC is still working on high priority to pursue MCL, involving Government & other agency to get newly allotted nearest mine void to fulfill this important regulatory obligation.***

**Efforts made by OPGCL to Maximise Utilisation of Fly-Ash:**

1. OPGCL has installed its own Fly-Ash brick plant with production capacity of 10,000 bricks per day, and steps have been made for all the bricks that are produced being utilised in all the ongoing and upcoming construction activities of OPGC.
2. Further, not only is OPGCL utilizing the Fly-Ash generated from its own Project in its own brick plant, OPGCL is also supplying Fly-Ash to 10 (ten) ash brick plants, which are located in and around the site of OPGCL's Project.
3. In order to further incentivize these brick plants to utilise the Fly-Ash from OPGCL's Project, OPGCL has extended a subsidy of Rs 150 per MT for use of Fly-Ash at its cost. However, ash utilization in brick manufacturing is limited to 2-3 % due to poor market demand.
4. Another avenue for Fly-Ash utilization which OPGC has explored is use in major road construction activities undertaken close to Jharsuguda or beyond Jharsuguda. The Fly-Ash demands for these activities are met by other TPPs, which are closer to the road construction areas. However, OPGCL still managed to supply 8830 MT of ash for road construction in the FY 2018-19.
5. OPGCL has entered into an agreement with Visveswariya National Institute of Technology, Nagpur ("**VNIT**") to devise technological advancements for enhancing ash percentage up to 90% in production of bricks and for geopolymeric use of ash in road construction.
6. Transportation subsidy of Rs 150/- per MT has been extended by OPGCL for enhancing ash utilization in areas of manufacturing of ash brick, other Fly-Ash-based products, cement/asbestos manufacturing & road construction.
7. OPGCL has been conducting various ash utilization awareness campaigns in the nearby community by way of street plays, distribution of pamphlets, etc.

8. Strong initiatives have been taken to identify low lying area/ stone quarries in the vicinity. Publications have been made in local newspapers for execution of low land reclamation to supply ash free of cost to the owner for proper utilization of abandoned low land. OPGC now is in process of reclaiming 3 low lying areas of 6.17 acres, 1.4 acres & 1.12 acres for which consent has been taken from State Pollution Control Board, Odisha.
9. Action has been initiated to utilise ash in OPGC expansion project MGR line construction.
10. Working to get mine voids allotment from MCL.
11. OPGCL has ensured that Fly-Ash ash is utilised, instead of precious earth, in the construction of embankment for ash pond as well as raising of bund height for ash pond.
12. OPGCL has also awarded a consultancy order to Centre For Fly Ash Research & Management ("**C-FARM**") headed by Dr. Vimal Kumar (Former Mission Director & Head, Fly-Ash Unit, Department of Science and Technology, Government of India) for scientific and technical advice for obtaining "Consent for mine void filling with fly ash". C-FARM is continuously deliberating with MCL, as well as with Central Mine Planning and Design Institute, on behalf of OPGCL for allotment of mine void for stowing with ash.

## PART – F

## Indicate disposal practice adopted for Hazardous as well as solid waste

**A. Hazardous Wastes:**

OPGC has obtained Hazardous Waste Authorization from OSPCB for Collection & Storage of Hazardous waste valid up to 31st March 2023.

Used Oil and grease are periodically collected from different location within plant & stored at designated place with concrete flooring, shed and secondary containment. The same is then transferred to a central storage area. This is being disposed to recyclers/re-processors having authorization & valid consent from SPCB & registered under CPCB.

Spent resin is temporarily stored in identified impervious pits at ITPS. It has been planned to dispose of the same in CHWTSDF. Asbestos generated from conveyer roofs as a phase out plan is disposed in underground pits within the plant premises. Discarded chemical containers are mostly returned to the Chemical suppliers against supply of fresh chemical supply.

E- Wastes are stored in designated places under concrete floor & shed. Inventorization of the same has been made & intimated to OSPCB. OPGC has signed lifetime membership agreement with M/S Ramky Enviro Engineers for disposal of non-soluble, non-incinerable and non-recyclable hazardous wastes at Common Hazardous Wastes Treatment Storage and Disposal Facility (CHWTSDF), Jajpur.

New Batteries are procured from Battery suppliers against buy back of used/waste batteries.

**B. Fly Ash and Bottom Ash**

OPGC has both wet ash disposal system as well as dry ash disposal system at ITPS for handling the main solid waste i.e. fly ash & bottom ash. OPGC has 03 Ash Ponds i.e.

i. Ash Pond A- 150 Acres
ii. Ash Pond B- 242 Acres

iii. Ash Pond C- 115 Acres.

Ash pond B was exhausted in August 2007 and thereafter a study was conducted through IIT, Madras where it was recommended to go for another 03-meter Dry Ash Mounds on the Pond B. Based on which OPGC has constructed Ash Mounds on the Pond successfully.

Ash pond A is in partial operation and ash is evacuated from ash Pond A for utilization in low lying areas reclamation and road construction.

Ash Pond-C is operational, and ash is disposed in form of lean slurry.

Dry ash collection facility with 500 MT capacities Storage Silo for utilization of dry fly ash by Cement Industries & ash brick/block manufacturing units is already in place. The ash collected in this Silo is from Field 2 of ESPs suitable for Cement & Brick production. Provision has been made for additional storage and collection facility (60 T/Hr with Storage facility of 120 MT) from 1st fields of ESPs. This dry ash collection facility is made for adequate dry ash availability in utilizing ash in low land reclamation and road construction.

**C. Other Solid Waste of Plant and Colony (Bio-degradable)**

Solid Waste of plant other than Fly Ash & Bottom Ash, like ferrous & non-ferrous scraps are collected regularly from different sites & deposited in the designated scrap yard for selling.

Kitchen waste is collected from Plant Canteen, Colony, Guest House, ITPS Market etc. and segregated as biodegradable and non-biodegradable is being disposed in an eco-friendly manner in a 1.0 Ton Capacity Bio-Gas Plant with zero effluent discharge.

Other biodegradable waste of plant & colony is regularly collected from different places & disposed on OPGC land. Domestic effluent from Plant is disposed through Septic Tanks and Soak Pits and Sewage from colony is treated in 1.0 MLD capacity Sewage Treatment Plant (STP) with zero effluent discharge. Treated Sewage is reused for watering green belt and also used in Park for horticulture purpose.

**D. Bio-medical Waste**

OPGC has 18-bedded Hospital at ITPS without any Operation Theatre. Bio-medical waste is mainly non-toxic in nature and the quantity is insignificant. Wastes are treated and disposed following the prescribed method as stipulated in Bio medical waste authorization issued by OSPCB vide letter No 4732 Dated 23.03.2021 & valid till 31.02.2026.

**E. Plastic waste**

Plastic waste is being segregated from Colony Garbage and packed in gunny bags. The gunny bags containing plastics are being stored in a designated place at township. The same is being given to plastic waste recycler. Process has been initiated to dispose the same through co-processing in cement plant of M/s ACC Limited. Formal agreement is already in place for disposal.

OPGC has declared no usage of plastic carry bags in colony and plant area. Regular campaigns are made to restrict the use of plastic carry bags in township and peripheral areas. OPGC has distributed Jute carry bags to all its employees to promote non usage of plastic carry bags.

## PART – G

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

- By adopting appropriate technology, operation & maintenance, monitoring practices and pollution control measures, OPGC has been successful in conserving coal, oil, water & energy through reduce /reuse/recycle.
- Through 100% Ash Water re-cycling system and maximum reuse of other liquid effluents is in process, not only control & prevention of water pollution takes place but also optimization of fresh water makeup has been taking place. Specific water consumption remains less than 3KL/MWH which indicates effective water conservation.
- Fuel oil consumption is monitored and controlled with minimum Unit light up periods and reducing number of Unit trips.
- Lubricant consumption is also monitored regularly to reduce its consumption.
- All bricks used for civil maintenance activities inside the plant are of ash bricks.
- Pond ash is being used for ash mound preparation & also for ash dyke height raising, thereby conserving soil for dyke height raising as well as increasing ash pond life.
- LED light and solar panel have led significant conservation of energy in township, as pond and street lighting

### B. IMPACT OF POLLUTION CONTROL MEASURES ON COST OF PRODUCTION:

Cost of production reduces due to

1. Process optimization to operate plant with reduced emission and higher efficiency.
2. Conservation of resources used as input (Coal, Oil, Water.)
3. Waste utilization & eco-friendly and cost-effective disposal means (Solid waste and hazardous waste).

The additional investment and the above benefits balance some way by treating the pollution control and mitigation is integrated with overall efficiency of the plant and cost of the production

## PART – H

**Additional investment proposal for Environmental protection abatement of pollution,**

**Prevention of pollution**

1. Utilization of ash in low lying areas, brick plants/asbestos- 700 lakh
2. Tree Plantation/Green belt development- 20 lakh
3. Installation of 2 Nos of 5 Kg/hr capacity incinerator for sanitary waste disposal- 7 Lakhs
4. Effective Ash dispersion control in Ash Pond at the time of turbulent wind flow- 30 lakh
5. Ash Disposal line replacement to reduce the risk of pipe line failure- 25 lakh
6. Hazardous waste disposal-15 Lakhs

6. Hazardous waste disposal-15 Lakhs
7. Maintenance of online analysers-10 Lakhs
8. ISO 14001:2015 recertification-2.5 Lakhs

## PART- I

### Any other particulars for improving the quality of Environment.

- Complying with the directions and conditions of state and central pollution boards.
- Environment Management by establishing ISO 14001:2015 EMS and Global EMS standard.
- Fine tuning of ESPs of both the Units for achieving desired emission level.
- Adequate plantation and greenbelt developed to minimise air as well as noise pollution. Planted approx. 3.22 lakh trees. 34.6% greenbelt and plantation exits in and around plant and colony premises.
- Water conservation by 100% Ash water recirculation and other effluents recycle & reuse. All the plant effluent is also getting recycled back in process.
- Housekeeping has been given highest priority. Plant & Colony premises are maintained clean all the time. Roads are black turfed to control fugitive emission. Colour coded bins have been provided at all generation points for proper segregation and management of wastes.
- Water, Coal, Oil & Ash leakages & spillages are being controlled at the source itself to maintain clean work place and clean environment.
- Provided HDPE Lining on New Ash Pond (Ash Pond C) to minimize water pollution. Ash dykes are extra strengthened to prevent dyke failure.
- Implemented sound wastes management practices.
- Carrying out regular environmental audits by competent auditors and taking timely corrective measures.
- Carrying out Annual Hydrogeological study for studying characteristics of aquifers and quality of ground water.

**Manas Ranjan Rout**
Director (Operations), OPGC

**********

# ENVIRONMENTAL STATEMENT

## Odisha Power Generation Corporation Ltd
## Ib Thermal Power Station

Banharpali, Jharsuguda

(2 x 660 MW)

**PERIOD FROM 1st APRIL 2021 TO 31st MARCH 2022**

**(FORM – V)**

**(See Rule 14)**

**Environmental Statement Report for the Financial Year ending the 31st March, 2022.**

**PART – A**

| | | |
|---|---|---|
| i. | Name and address of the Owner/Occupier of the Industry | : **Mr. Manas Ranjan Rout**<br>Odisha Power Generation Corp. Ltd.<br>Ib Thermal Power Station<br>Banharpali, Jharsuguda<br>Pin Code- 768234<br>Site Office-Ph.06645-222220, Fax. 222230<br>Corp. Office- 06742303754, Fax. 2303755 |
| ii. | Production Capacity | : 1320 MW (2X660 MW) |
| iii. | Year of Establishment | : Unit#3-03.07.2019<br>Unit#4-21.08.2019 |
| iv. | Date of last Environment Statement submitted | : 22.09.2021 |
| v. | Industry category | : Thermal Power Plant |

## PART – B

## (Water and Raw Material Consumption)

**(All values indicate Annual consumption) in $m^3$/day**

| Sl. | Description | **2020-2021** | **2021-2022** |
|---|---|---|---|
| (I) | Gross Energy Generation (MU): | 5967.429 | 7236.554 |
| (ii) | Total Water consumption/day: | 46700 | 54589 |
| (iii) | Ash disposal make up, Process NEBD: | No fresh water used for handling ash | No fresh water used for handling ash |
| (iv) | Cooling, Spraying, Boiler Feed: | 41563 | 48584 |
| (v) | Domestic*: (Excluding Township) | Reported under OPGC-1 (2x210 MW) | Reported under OPGC-1 (2x210 MW) |
| (vi) | Process, EBD | 5137 | 6004 |

| **Sl No** | **Name of the product** | **Process Water Consumption per Unit of Product Output** | |
|---|---|---|---|
| | | **2020-21** | **2021-22** |
| 01 | Electricity | 2.86 KL/MWH | 2.75 KL/MWH |

| **Name of Raw Material** | **Name of the product** | **Consumption of Raw Material unit of output** | | | |
|---|---|---|---|---|---|
| | | **2020-21** | | **2021-22** | |
| Coal | Electricity | Total Consumption | 4762143MT | Total Consumption | 5417921 MT |
| | | Specific Consumption | 0.798 Kg/KWH | Specific Consumption | 0.748 Kg/KWH |
| Start-up Fuel Oil (LDO) | Electricity | Total Consumption | 2301.33 KL | Total Consumption | 2159.79 KL |
| | | Specific Consumption | 0.386 ml/KWH | Specific Consumption | 0.298 ml/KWH |

## PART – C
## Pollution discharged to Environment and Pollution Level

| PERIOD- April 2021 TO March 2022 | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| STACK EMISSION | | | | | | | | |
| PARAMETER | NORM | STACK #3 | | | NORM | STACK #4 | | |
| | | MAX. | MIN. | AVE. | | MAX. | MIN. | AVE. |
| PM ($mg/Nm^3$) | **50** | 45 | 29 | 37 | **50** | 42 | 36 | 38 |
| $SO_2$ ($mg/Nm^3$) | **200** | 13.4 | 6.2 | 8 | **200** | 11.8 | 7.2 | 8.3 |
| $NO_X$ ($mg/Nm^3$) | **450** | 19.3 | 6.9 | 10.3 | **450** | 12.7 | 8.3 | 9.6 |

| AMBIENT AIR QUALITY | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| PARAMETER | NORM | INDUSTRIAL | | | NORM | RESIDENTIAL | | |
| | | MAX. | MIN. | AVE. | | MAX. | MIN. | AVE. |
| $PM_{10}$ ug/m3 | **100** | 93 | 18 | 64 | **100** | 88 | 16 | 59 |
| $PM_{2.5}$ ug/m3 | **60** | 54 | 12 | 36 | **60** | 52 | 10 | 33 |
| $SO_2$ (ug/m3) | **80** | 20 | 7 | 14 | **80** | 15 | 8 | 10 |
| $NO_x$ (ug/m3) | **80** | 32 | 13 | 23 | **80** | 23 | 15 | 20 |

| STP WATER QUALITY | | | | | AMBIENT NOISE in dB(A) | | | |
|---|---|---|---|---|---|---|---|---|
| PARAMETER | NORM | MAX | MIN | AVE. | INDUSTRIAL | | RESIDENTIAL | |
| pH | **6.5 – 9.0** | 7.53 | 7.25 | 7.41 | MAX. | MIN. | MAX. | MIN. |
| TSS, mg/ltr | **100** | 38 | 21 | 30 | DAY TIME | | | |
| BOD(3 days at $27^0C$), mg/ltr | **30** | 8 | 6.5 | 6.9 | NORM | | | |
| COD, mg/ltr | **250** | 34 | 20 | 26 | **75** | | **55** | |
| Total Nitrogen(as N) | **10** | 5.7 | 3.7 | 4.5 | 73 | 65 | 48 | 39 |
| Ammonical Nitrogen(as $NH_3$-N) | **50** | 2.6 | 1.2 | 2 | NIGHT TIME | | | |
| Total coliform | -- | 260 | 140 | 186 | NORM | | | |
| Fecal coliform | **<1000** | 84 | 47 | 59 | **70** | | **45** | |
| | | | | | 69 | 63 | 40 | 34 |

OPGC has installed continuous emission monitoring system for both the stacks, four continuous ambient air quality monitoring stations and one continuous effluent monitoring station for round the clock monitoring and control of emission/pollution parameters. These stations are connected to SPCB & CPCB servers through real time data acquisition and transmission facility. The plant has achieved zero effluent discharge from December'18 onwards and till December'18 only 1 % effluent had been discharged after meeting the norms.

## PART – D
## HAZARDOUS WASTES

**(As specified under Hazardous wastes/management & Handling Rules, 2008)**

**A. From Process:**

| Hazardous Waste Types | 2020-21 | | | | 2021-22 | | | |
|---|---|---|---|---|---|---|---|---|
| | Opening stock | Generation | Sold/ Disposed | Balance | Opening stock | Generation | Sold/ Disposed | Balance |
| Used oil/Spent oil<br>a. Used Lub. Oil : KL<br>b. Used Grease: MT<br>c. Used Transformer Oil:KL | **1 KL**<br>a. 1 KL<br>b. Nil<br>c. Nil | **30.625 KL**<br>a. 30.625 KL<br>b. Nil<br>c. Nil | Nil | **31.625 KL** | **31.625 KL** | **20.400 KL**<br>a. 20 KL<br>b. 0.400 KL<br>c. Nil | Nil | 52**.025 KL** |
| Sludge contaminated with oil: KL | **Nil** | Nil | Nil | Nil | Nil | Nil | Nil | Nil |
| Spent ion exchange resin, MT | **Nil** | **Nil** | **Nil** | **Nil** | **Nil** | **Nil** | **Nil** | **Nil** |
| Waste Residue Containing Oil | 1 MT | 1.5 MT | Nil | 2.5 MT | 2.5 MT | 1.5 MT (oily cotton waste) | Nil | 4 MT |
| Used batteries(Nos.) | **Nil** | 292 Nos | 26 Nos | 266 Nos | 266 Nos | 13 Nos | 24 Nos | 255 Nos |

**B. From Pollution Control Facilities:** No generation

## PART – E

## SOLID WASTES

**A. Ash:**

| Solid Wastes (Ash): | Total Quantity (MT) | |
|---|---|---|
| | 2020-21 | 2021-22 |
| From Process | **425118 MT (Bottom Ash)** | **484130 MT (Bottom Ash)** |
| From Pollution Control Facilities | **1700458 MT (Fly Ash)** | **1936520 MT (Fly Ash)** |
| Quantity Utilized | **484577 MT** | **578046 MT** |
| Disposed in Ash Pond | **1640999 MT** | **1842604 MT** |

**Reasons for variation from the target**

1. Since the plant is situated in a remote location (pit head power plant located in rural area) there is very limited scope of ash utilization in brick manufacturing. More ever utilization in this particular area cannot exceed more than 2% to 3%.

2. Big stone quarry or low lands are not available in the locality.

3. Export of ash is not feasible since the site is located at a distance of 500 Km from the nearest port. Transportation from site to nearest port through rail or any other means is not feasible.

4. Major road construction activities are taking place near Jharsuguda (Expansion of Sambalpur Rourkela Sate Highway No-10 & Expansion of Sambalpur National Highway No-42). The ash demands for these activities are met by other thermal power plants, close to the road construction areas. However, we have supplied around 8830 MT of ash in the last financial year for construction of road.

5. No scope available in major ash utilization area i.e. Cement Plant use for production of PPC cement. Only one cement plant is available in the vicinity i.e. M/s Ultratech Cement Ltd. M/s Ultratech off takes entire quantity of ash for cement manufacturing from its sister concern i.e. from M/s Aditya Aluminium (Lapanga).

6. Considering OPGC plant's location (Pit Head), mine void back filling of ash is the only means of utilization by which OPGC can achieve 100% ash utilization. The steps so far are as follows.

i. There was progress on mine void allotment in the year 2006. With the support from Regional Office, MoEF and SPCB, MCL has consented to allot Lilari mine void to OPGC. Subsequently, in July 2007, MCL accorded consent for taking up EIA & Feasibility Study for back filling in the void based on which OPGC engaged CIMFR to conduct the studies in October 2007. During the course of the EIA study, the consent given to OPGC was withdrawn by MCL unilaterally vide their letter No MCL-3185/13.02.2008 stating "the life of Lilari Mine is extended with ten more years". Thereafter, OPGC has been pursuing MCL time and again involving regulatory as well as Govt. to reconsider the withdrawal or consider allotting any other mine void near to OPGC site but there has been no progress.

ii. State Pollution Control Board, Odisha made a proceeding on 05.06.10 for backfilling of OPGC ash in BOCM Mine void of MCL as an alternative solution against allotment of Lilari Mine void but no initiative has been taken so far from MCL side.

iii. MCL has also been directed repeatedly by OPGC Chairman & Principal Secretary, Energy, Govt of Odisha, managing Director and Director (Operation) but no positive response has so far been received from MCL.

iv. In a meeting held on 24.01.2011 with Principal secretary Energy, Govt. of Odisha, CMD, MCL has given consent to give principal approval for back filling BOCM mind void but the same has not been done, so far.

v. In response to the letter of Director (Operation), OPGC, dtd.24.08.2013 on the subject, Director (Tech. P&P), MCL negated the request on the ground of BOCM expansion towards dip slide and no scope to back fill ash in running mine even though OPGC proposed for a partition bund to separate the void space from active mine for ash back filling.

vi. In a high-level meeting held on 13.12.2013 under the Chairmanship of Chief Secretary, GoO, directions for allotment of BOCM mine void to OPGCL were issued to MCL on 03.04.2014 by Dept. of Environment & Forest, GoO. The said directions were for taking expeditious steps on this front. However, there has not been any progress as yet.

vii. In a letter dated 10.08.2020 OPGC had again requested Director Technical for allotment of BOCM mine void, however the request was turned down stating various technical causes.

viii. In a letter dated 14.06.2021 OPGC had again requested Director Technical for allotment of BOCM mine void, however the request was turned down vide MCL letter No253H, dated 07.08.2021 stating the reason of excavation of bottom seam and integration of Lakhanpur, Belpahar & Lilari mines.

***However, OPGC is still working on high priority to pursue MCL, involving Government & other agency to get newly allotted nearest mine void to fulfill this important regulatory obligation.***

**Efforts made by OPGCL to Maximise Utilisation of Fly-Ash:**

1. OPGCL has installed its own Fly-Ash brick plant with production capacity of 10,000 bricks per day, and steps have been made for all the bricks that are produced being utilised in all the ongoing and upcoming construction activities of OPGC.
2. Further, not only is OPGCL utilizing the Fly-Ash generated from its own Project in its own brick plant, OPGCL is also supplying Fly-Ash to 10 (ten) ash brick plants, which are located in and around the site of OPGCL's Project.
3. In order to further incentivise these brick plants to utilise the Fly-Ash from OPGCL's Project, OPGCL has extended a subsidy of Rs 150 per MT for use of Fly-Ash at its cost. However, ash utilization in brick manufacturing is limited to 2-3 % due to poor market demand.
4. Another avenue for Fly-Ash utilization which OPGC has explored is use in major road construction activities undertaken close to Jharsuguda or beyond Jharsuguda. The Fly-Ash demands for these activities are met by other TPPs, which are closer to the road construction areas. However, OPGCL still managed to supply 8830 MT of ash for road construction in the FY 2018-19.
5. OPGCL has entered into an agreement with Visveswariya National Institute of Technology, Nagpur ("**VNIT**") to devise technological advancements for enhancing ash percentage up to 90% in production of bricks and for geopolymeric use of ash in road construction.
6. Transportation subsidy of Rs 150/- per MT has been extended by OPGCL for enhancing ash utilization in areas of manufacturing of ash brick, other Fly-Ash-based products, cement/asbestos manufacturing & road construction.
7. OPGCL has been conducting various ash utilization awareness campaigns in the nearby community by way of street plays, distribution of pamphlets, etc.
8. Strong initiatives have been taken to identify low lying area/ stone quarries in the vicinity. Publications have been made in local newspapers for execution of low land reclamation to supply ash free of cost to the owner for proper utilization of abandoned low land. OPGC now is in process of reclaiming 3 low lying areas of 6.17 acres, 1.4 acres & 1.12 acres for which consent has been taken from State Pollution Control Board, Odisha.
9. Action has been initiated to utilise ash in OPGC expansion project MGR line construction.
10. Working to get mine voids allotment from MCL.
11. OPGCL has ensured that Fly-Ash ash is utilised, instead of precious earth, in the construction of embankment for ash pond as well as raising of bund height for ash pond.

12. OPGCL has also awarded a consultancy order to Centre For Fly Ash Research & Management ("**C-FARM**") headed by Dr. Vimal Kumar (Former Mission Director & Head, Fly-Ash Unit, Department of Science and Technology, Government of India) for scientific and technical advice for obtaining "Consent for mine void filling with fly ash". C-FARM is continuously deliberating with MCL, as well as with Central Mine Planning and Design Institute, on behalf of OPGCL for allotment of mine void for stowing with ash.

## PART – F

## Indicate disposal practice adopted for Hazardous as well as solid waste

**A. Hazardous Wastes:**

OPGC has obtained Hazardous Waste Authorization from OSPCB for Collection & Storage of Hazardous waste valid up to 31st March 2024.

Used Oil and grease are periodically collected from different location within plant & stored at designated place with concrete flooring, shed and secondary containment. The same is then transferred to a central storage area. This is being disposed to recyclers/re-processors having authorization & valid consent from SPCB & registered under CPCB.

Spent resin is temporarily stored in identified impervious pits at ITPS. It has been planned to dispose of the same in CHWTSDF. Discarded chemical containers are mostly returned to the Chemical suppliers against supply of fresh chemical supply. Used oil drums are disposed along with used oil.

E- Wastes are stored in designated places under concrete floor & shed. Inventorization of the same has been made & intimated to OSPCB. OPGC has signed lifetime membership agreement with M/S Ramky Enviro Engineers for disposal of non-soluble, non-incinerable and non-recyclable hazardous wastes at Common Hazardous Wastes Treatment Storage and Disposal Facility (CHWTSDF), Jajpur. OPGC is in discussion with M/s Ramky for disposal of temporarily stored wastes (Spent resins & Asbestos).

New Batteries are procured from Battery suppliers against buy back of used/waste batteries.

**B. Fly Ash and Bottom Ash**

OPGC has both wet ash disposal system as well as dry ash disposal system at ITPS for handling the main solid waste i.e. fly ash & bottom ash. OPGC-2 (2X660 MW) has 02 Ash Ponds i.e.

i. Tilia Phase-1 Ash Pond-125 Acres
ii. Tilia Phase-2 Ash Pond- 180 Acres

Tilia Phase-1 Ash Pond has started operation since 24.07.2020 and the ash generated from OPGC-2 was disposed in Ash Pond-C of OPGC-1, temporarily till 23.07.2020 through HCSD for Fly Ash & LCSD for bottom ash.
Dry ash collection facility with 8100 MT capacities (3 nos of silos of 2700 MT capacity each) Storage Silo for utilization of dry fly ash by Cement Industries & ash brick/block manufacturing units is already in place. Provisions have been made for evacuation of ash through rail directly from the silos.

**C. Other Solid Waste of Plant and Colony (Bio-degradable)**

Solid Waste of plant other than Fly Ash & Bottom Ash, like ferrous & non-ferrous scraps are collected regularly from different sites & deposited in the designated scrap yard for selling.

Kitchen waste is collected from Plant Canteen, Colony, Guest House, ITPS Market etc. and segregated as biodegradable and non-biodegradable is being disposed in an eco-friendly manner in a 1.0 Ton Capacity Bio-Gas Plant with zero effluent discharge.

Other biodegradable waste of plant & colony is regularly collected from different places & disposed on OPGC land. Domestic effluent from Plant is disposed through Septic Tanks and Soak Pits and Sewage from colony is treated in 1.0 MLD capacity Sewage Treatment Plant (STP) with zero effluent discharge. Facility for pumping of sewage generated from office buildings to centralized STP at township is under progress. Treated Sewage is reused for watering green belt and also used in Park for horticulture purpose.

**D. Bio-medical Waste**

OPGC has 18-bedded Hospital at ITPS without any Operation Theatre. Bio-medical waste is mainly non-toxic in nature and the quantity is insignificant. Wastes are treated and disposed following the prescribed method as stipulated in Bio medical waste authorization issued by OSPCB vide letter No 4732 Dated 23.03.2021 & valid till 31.02.2026.

**E. Plastic waste**

Plastic waste is being segregated from Colony Garbage and packed in gunny bags. The gunny bags containing plastics are being stored in a designated place at township. The same is being given to plastic waste recycler. Process has been initiated to dispose the same through co-processing in cement plant of M/s ACC Limited. Formal agreement is already in place for disposal.

OPGC has declared no usage of plastic carry bags in colony and plant area. Regular campaigns are made to restrict the use of plastic carry bags in township and peripheral areas. OPGC has distributed Jute carry bags to all its employees to promote non usage of plastic carry bags.

## PART – G

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

- By adopting appropriate technology, operation & maintenance, monitoring practices and pollution control measures, OPGC has been successful in conserving coal, oil, water & energy through reduce /reuse/recycle.
- Through 100% Ash Water re-cycling system and maximum reuse of other liquid effluents is in process, not only control & prevention of water pollution takes place but also optimization of fresh water makeup has been taking place. Specific water consumption remains less than 2.75KL/MWH against the norm of 3.5 KL/MWH. Process optimization is under progress to reduce it further to less than 2.5 KL/MWH.
- Fuel oil consumption is monitored and controlled with minimum Unit light up periods and reducing number of Unit trips.
- Lubricant consumption is also monitored regularly to reduce its consumption.

- All bricks used for civil maintenance activities inside the plant are of ash bricks.
- Pond ash is being used for ash mound preparation & also for ash dyke height raising, thereby conserving soil for dyke height raising as well as increasing ash pond life.
- LED light and solar panel have led significant conservation of energy in township, as pond and street lighting

**B. IMPACT OF POLLUTION CONTROL MEASURES ON COST OF PRODUCTION:**

Cost of production reduces due to

1. Process optimization to operate plant with reduced emission and higher efficiency.
2. Conservation of resources used as input (Coal, Oil, Water.)
3. Waste utilization & eco-friendly and cost-effective disposal means (Solid waste and hazardous waste).

The additional investment and the above benefits balance some way by treating the pollution control and mitigation is integrated with overall efficiency of the plant and cost of the production

## PART – H

**Additional investment proposal for Environmental protection abatement of pollution,**

**Prevention of pollution**

1. Utilization of ash in low lying areas, brick plants/asbestos- 1000 lakh
2. Utilization in Cement Industries-800 Lakhs
3. Tree Plantation/Green belt development- 40 lakh
4. Installation of mist sprayer for dust suppression -6 Lakhs
5. Installation of 2 Nos of 5 Kg/hr capacity incinerator for sanitary waste disposal- 25 Lakhs
6. Tree sapling distribution in the peripheral villages- 1.5 Lakhs
7. Effective Ash dispersion control in Ash Pond at the time of turbulent wind flow- 30 lakh
8. Ash Disposal line replacement to reduce the risk of pipe line failure- 50 lakh
9. Hazardous waste disposal-15 Lakhs
10. Maintenance of online analysers-15 Lakhs
11. ISO 14001:2015 -3 Lakhs
12. Carrying out bird nesting for improvement of biodiversity-10 Lakhs

## PART- I

### Any other particulars for improving the quality of environment.

- Complying with the directions and conditions of state and central pollution boards.
- Environment Management by establishing ISO 14001:2015 EMS and Global EMS standard.
- Fine tuning of ESPs of both the Units for achieving desired emission level.
- Adequate plantation and greenbelt developed to minimise air as well as noise pollution. Planted approx. 3.22 lakh trees. 34.6% greenbelt and plantation exits in and around plant and colony premises.
- Water conservation by 100% Ash water recirculation and other effluents recycle & reuse. All the plant effluent is also getting recycled back in process.
- Housekeeping has been given highest priority. Plant & Colony premises are maintained clean all the time. Roads are black turfed to control fugitive emission. Colour coded bins have been provided at all generation points for proper segregation and management of wastes.
- Water, Coal, Oil & Ash leakages & spillages are being controlled at the source itself to maintain clean work place and clean environment.
- Provided HDPE Lining on New Ash Pond (Tilia Phase-1 & Phase-2 Ash Ponds) to minimize water pollution. Ash dykes are extra strengthened to prevent dyke failure.
- Implemented sound wastes management practices.
- Carrying out regular environmental audits by competent auditors and taking timely corrective measures.
- Carrying out Annual Hydrogeological study for studying characteristics of aquifers and quality of ground water. The Annual Hydrogeological study is vetted through IIT Madras.

**Manas Ranjan Rout**
Director (Operations) & Occupier

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