



27<sup>th</sup> November, 2020

To,  
The Director (S)  
Eastern Regional Office,  
Ministry of Environment and Forests & CC,  
Government of India,  
A/3, Chandrasekharapur,  
**Bhubaneswar - 751023**

Sub: **Compliance of Environment Clearance (EC) conditions for the period April'20 to September'20**

Ref.: EC No.: (i) J-11011/400/2006-IA II (I), dated 6<sup>th</sup> February 2008 & J-11011/144/2006-IA II (I), dated 19 October 2009  
(ii) J-11011/53/2004-IA.II (I), dated 14<sup>th</sup> July 2005  
(iii) J-11011/42/2000-IA.II, dated 10<sup>th</sup> January 2001  
(iv) J-13012/10/2004-IA.II (T), dated 21<sup>st</sup> September 2005  
(v) J-13011/1/99-IA.II (T), dated 24<sup>th</sup> April 2005  
(vi) J-13011/1/99-IA.II (T), dated 04<sup>th</sup> August 1999  
(vii) J-13011/18/88-IA, dated 11<sup>th</sup> May 1989

Dear Sir,

With referene to the above stated Environment Clearance (EC), accorded to our Aluminium Smelter & CPP Plant at Hirakud in the district of Sambalpur, Odisha, please find enclosed herewith the six monthly compliances of the conditions laid down in the ECs for the period of April'20 to September'20, along with data on environment quality of both the plants.

The compliances have been sent through mail id: [roez.bsr-mef@ori.nic.in](mailto:roez.bsr-mef@ori.nic.in).

Thanking you.

Yours truly  
**For Hindalco Industries Limited, Hirakud**

**R.K.Gupta**  
**Head- Sambalpur Cluster**

Encl: As above

Hindalco Industries Limited

Hirakud Complex, Hirakud - 768 016, District: Sambalpur, Odisha, India

T: +91 663 2481307/2481273/2481295 | Fax: +91 663 2481356/2481342 | E: [hindalco@adityabirla.com](mailto:hindalco@adityabirla.com) | W: [www.hindalco.com](http://www.hindalco.com)

Registered Office: Ahura Centre, 1st Floor, B-Wing, Mahakali Caves Road, Andheri (East), Mumbai-400 093, India

Tel: +91 22 6691 7000 | Fax: +91 222 6691 7001

Corporate ID No.: L27020MH1958PLC011238

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## **COMPLIANCE TO ENVIRONMENT CLEARANCE (EC) CONDITIONS**

**(April 2020 - September 2020)**

**MINISTRY OF ENVIRONMENT & FORESTS (MoEF&CC) ENVIRONMENTAL CLEARANCE(EC)  
FOR EXPANSION OF SMELTER PLANT FROM 100 KTPA TO 360 KTPA AND CAPTIVE POWER  
PLANT FROM 267.5 MW TO 967.5 MW AT HIRAKUD BY M/s HINDALCO INDUSTRIES LIMITED**

**EC No. - J - 11011/400/2006-IA II (I), dated: 6 February 2008, &  
Amendment Letter - J - 11011/144/2006-IA II (I), dated 19 October 2009.**

<b>Sl. No</b>	<b>CONDITIONS</b>	<b>STATUS AS ON 30<sup>th</sup> September 2020</b>
2	<p>The Ministry of Environment and Forests has examined the proposal. It is noted that the proposal is for expansion of smelting capacity of Aluminium metal from the existing 1, 00,000 MTA (including 35,000 TPA capacity under trial) to 3, 60,000 TPA and Captive Power Plant capacity from 267.5 MW (including 100 MW under trial) to 967.5 MW at the Smelter Plant at Hirakud, Sambalpur, Orissa. The project cost is Rs.5195 Crores, out of which Rs.369 Crores has been earmarked for pollution control measures. This expansion will be undertaken in two phases. In Phase I, 46,000 MTA capacity will be added and in Phase II, the addition shall be of 2, 14,000 MTA. Presently, HIL has 468 pots of Soderberg Technology and 164 of Pre-baked Anode Technology (632 pots of 1, 00,000 MTA). During Phase-I, the capacity shall be increased to 1, 46,000 MTA by changing all (468) Soderberg pots to Pre-Baked ones. Additional 14 pots will be shifted from Belgaum unit and shall also be converted into Pre-Baked. This will result in total of 646 pots of Pre-Baked technology having a capacity of 1, 46,000 MTA. During phase II, 232 new Pre-Baked pots with 2, 14,000 TPA capacity will be added. The unit has Captive Power Plant of 267.5 MW. 100 MW will be added in phase-I and 600 MW in phase-II, thereby making the final capacity as 967.5 M.Th. power plant will be based on CFBC/PFC Boiler. Coal for CPP shall be procured from coal fields 20 km away and transported in covered Volvo trucks which will be later shifted to railway. Most of the other materials will also be transported by railways.</p>	<p>The capacity of the Smelter Plant has been increased from 100000 TPA to 146000 TPA in Phase - I. 468 pots based on Soderberg technology was converted to prebaked ones. In Phase – II the Smelter was expanded to 216000 TPA by adding 80 pots of capacity 70000 TPA. All pots used in the Smelter are based on prebaked technology.</p> <p>The CPP has been expanded from 267.5 MW to 467.5 MW by adding 100 MW in Phase - I and additional 100 MW in Phase - II. Currently CPP is operating with installed capacity of 467.5 MW having configuration of 1 x 67.5 MW and 4 x 100 MW. The CPP is based on CFBC technology.</p> <p>Coal is procured from captive coal mine at Garepalma in the state of Chhattisgarh &amp; other coal mine inside state of Odisha. It is transported from captive mine and other sources through railways as well as through tarpaulin covered trucks. For handling (Unloading from wagons &amp; loading in the trucks for transporting to nearby coal yards), of coal procured through railways, a railway siding has been established within the premises of CPP.</p>



- 3 The Phase-I units will be accommodated within the existing 163.95 ha of land. For Phase-II units, additional 91 ha of land will be acquired. No R&R is involved in the project and no forest land is involved in the project. The site is about 8.5 km away from Sambalpur town. Hirakud reservoir on Mahanadi river is located 1.2 km away from the plant. Small size reserve forests (Laxmi dungri, Ram dungri and Jamraha) are located within 10 km radius of the plant. No ecologically sensitive zone exists within 10 km periphery of the project. The proposed Sambalpur Elephant Reserve falls outside 10 km radius of the plant site and the site does not fall in the elephant movement corridor.
- In Phase - I expansion, Smelter has increased its capacity from 1,00,000 TPA to 1,46,000 TPA and CPP from 267.5 MW to 367.5 MW.
- In Phase - II of Smelter Plant has added 80 pots having capacity 70 KTPA, taking total capacity of the unit to 216 KTPA and CPP added 100 MW(Unit - V) increasing total capacity to 467.5MW.
- Both phases of expansions have been accommodated within the existing 163.95 ha of land. No R&R and forest land is involved in the project. No Ecologically sensitive zone exist within 10KM periphery of the project.
- 4 The raw water requirement shall increase from 31,955 to 1, 01,555 KLD, thereby increase for the expansion project will be 69,600 KLD which will be sourced from the Hirakud reservoir. 14,250 KLD of wastewater will be generated from the expansion project. Wastewater generation shall increase from 8278 KLD to 22,528 KLD thereby increase in waste water generation for the expansion project will be 14,250 KLD .This will be treated in Rotating Biological Contactor and reused with in the plant. Cooling water blow down from the power plant will be treated to meet the discharge standards and discharged into Kharjhor nalla. 7650 TPA of solid waste generated from smelter will be disposed of as per CPCB guidelines, in secured landfill site inside the premises. 2.55 million TPA of coal ash generated from power plant will be disposed as dry ash mounds. Coal ash disposal as backfill material in abandoned coal mines has been explored.
- The raw water requirement is sourced from the Hirakud Reservoir. During the period, a total of 3978398 KL @21740 KLD of water has been drawn from the reservoir.
- For treatment of Smelter Plant effluent, three RO based ETPs (two of 250 KLD capacity and one of 50 KLD capacity) have been installed. For treatment of effluent from our Flat Rolled Product (FRP) unit, an ETP Integrated with RO Capacity of 120 KLD has been installed.
- Five STPs (500 KLD, 2 x 100 KLD, 400 KLD, 300 KLD capacities) have been provided for treatment of sewage water from canteen, toilets & colony of three plants including FRP.
- Solid wastes generated from the Smelter Plant are disposed of to the registered and authorized agencies, TSDF and in the Secured Landfill site as per the CPCB guideline.
- Cooling tower blow down from the power plant is treated in RO plant of capacity 120 m<sup>3</sup>/hr for reuse in process and cooling. Other effluents from the plant is treated to meet the standards for discharge, stored in the common monitoring basin and entirely reused in cooling towers and other in-house activities with no discharge to outside in dry season as per CTO.
- Coal ash generated from the Power Plant is utilized in cement plants, brick manufacturing units, road making, low lying area filling etc. Balance ash, if any, is disposed dry at ash mound. 451235 MT of ash was generated with



utilization of 359008 MT during the period April'20 to September'20.

#### A. SPECIFIC CONDITIONS :

- (i) As stated in the Public Hearing, the new expansion site shall be on the opposite side of the village. : The expansion site is on the opposite side of the village.
- (ii) The expansion shall be based only on Pre-baked Anode Technology and all Soderberg Technology based pots shall be converted to Pre-baked Anode Technology, as per the schedule submitted to the Ministry. The Captive Power Plant shall be based on CFBC/PFC Boiler. : Only prebake anode technology is being adopted. All the soderberg pots have already been converted to prebake one. All the boilers of 467.5 MW Power Plant are CFBC in nature.
- (iii) The gaseous emissions (SO<sub>2</sub>, NO<sub>x</sub>, CO, HC and Fluoride) and Particulate matter along with RSPM levels from various process units shall conform to the standards prescribed by the concerned authorities from time to time. The State Board may specify more stringent standards for the relevant parameters keeping in view of the nature of the industry and its size and location. At no time the emission level shall go beyond the prescribed standards. On-line continuous monitoring system for particulate emissions, SO<sub>2</sub> and NO<sub>x</sub> shall be provided and shall make necessary arrangements for submission of on-line real time emission data to CPCB website. Interlocking facility shall be provided between pollution control equipment and the process operation so that in the event of the pollution control equipment not working, the respective unit (s) is shut down automatically. In the event of failure of any pollution control system adopted by the unit, the respective unit should not be restarted until the control measures are rectified to achieve the desired efficiency. Low NO<sub>x</sub> burners shall be installed to control the NO<sub>x</sub> emissions. : The emission/discharge conform to the standards prescribed by MoEF&CC, CPCB and OSPCB from time to time.

Particulate Matter and Fluoride from the Smelter through FTP out let and fugitive fluoride from pot rooms is being monitored regularly. In CPP, environment friendly CFBC boilers have been provided to each unit, which are low NO<sub>x</sub> producing in nature for the technology used in the boiler. ESPs, of efficiency 99.9%, fitted with High Frequency Rectifier Transformers (HFTRs) have been attached to each boiler of the CPP to maintain the Particulate Matter below the standard stipulated by MoEF&CC vide its notification dated 07<sup>th</sup> Dec 2015. Use of crushed lime stone in the bed of the boilers is in progress for reduction in generation of SO<sub>2</sub>, much below the stipulated standard.

Online real-time fluoride and dust monitoring analyzers installed at all FTP stack of Smelter. Forbes Marshall-Codel make Opacity Monitors (Model No: DCEM-2100) have been installed and commissioned in all the stacks of CPP. Further, online Continuous Flue gas Analyzers of SO<sub>2</sub>, NO<sub>x</sub> (Model No: GCEM 4000 of Codel make) have also been installed in all the stacks. Similarly in our FRP, 3 online PM analyzers have been provided in stacks of HRM & CRM. Real time data from the online monitors of Smelter, Power & FRP transmitted to SPCB/CPCB server on continuous basis.



- (iv) Only 10 new stacks shall be installed for the expansion project - 4 in smelter plant, 4 in anode plant and 2 in casting unit. The scrubbed alumina from Alumina based dry scrubbing system shall be reused in process. Minimum stack height shall be 50 m. The minimum height of other stacks of anode plant and casting plant shall be 35 m, which shall base on Sulphur content of fuel. 3 new stacks in power plant shall be provided with ESP.
- (v) Total Fluoride emissions and pitch fumes from smelter and anode-baking unit shall be controlled using alumina based dry scrubbing system to limit Fluorides emissions within 0.8 kg/ton Aluminium produced and SPM within 50 mg/Nm<sup>3</sup>. SPM emissions from Captive Power Plant shall be less than 100 mg/NM<sup>3</sup>. Forage Fluoride levels of less than 80 ppm for one month, less than 60 ppm for two months and less than 40 ppm for 12 months shall be complied with. Further the pot emissions through fume treatment plant shall not exceed 0.30 kg/ton of Aluminium produced.
- (vi) Regular monitoring of fluoride content in ambient air, forage fluoride and in ground water shall be carried out and data shall be submitted to State pollution Control Board.
- (vii) Raw material shall be stored in covered yards. Water sprinkling arrangement shall be made in the raw material stock yard to control fugitive emissions. Coal and other raw material shall be transported in
- As the pollution control devices are attached to multiple process operation (pots in case of Smelter and boilers in case of CPP) and the operation are continuous one, inter locking facilities are not feasible. However we have installed alarm system for any failure of pollution control systems attached to the operations.
- Fume Treatment Plant (FTPs) with dry scrubbing systems have been installed in Smelter & the enriched alumina from the FTPs is being reused in the process. Five Stacks of height 50m have been provided to all FTPs and six stacks of height 35 m (and above) have been provided to casting unit & caster. No anode baking plant exists inside the smelting unit. Stacks of height 130 m have been provided for each unit of CPP. ESPs of efficiency 99.9%, equipped with High Frequency Rectifier Transformers (HFTRs) have been provided to all boilers of the 467.5 MW CPP.
- All the FTPs of the Smelter are based on alumina based dry scrubbers through which the total fluoride emission is controlled within the prescribed limit of CPCB/SPCB. Green anode of our nearby sister concern Aditya Aluminium is used in the smelting process. The particulate matter, fluoride emissions and forage fluoride in grass are being regularly monitored for the existing pot lines and reported to SPCB and Ministry through half yearly compliance reports. All the processes of Smelter Plant & CPP are meeting the stipulated norms of MoEF&CC/CPCB/SPCB.
- Regular monitoring of fluoride in surface and ground water as well as forage fluoride, as an indicator of ambient air fluoride is carried out and the data is submitted to State Pollution Control Board through monthly progress reports.
- The coal for Power Plant is transported from various sources through railways, covered trucks and stored under sheds in the coal yard of Power plant where sprinkling is done through



covered trucks, containers etc., which shall later be shifted to covered rail wagons.

fixed sprinklers to prevent the fugitive emission. Fugitive dust in the area is also suppressed by water sprinkling through mobile water tankers. Transportation of coal through railway has been started from Feb-2018. Alumina for Smelter Plant is transported from captive Alumina Refinery at Raygada and Muri through railways and stored in dedicated silos.

- (viii) In plant control measures for checking fugitive emissions from all the vulnerable sources like spillage/raw materials/coal handlings etc. shall be provided. Further, specific measures like provision of dust extraction and suppression system consisting of water sprinkling, suction hoods, fans, cyclones, bag filters, ventury scrubber etc. shall be installed at material transfer points and other enclosed raw material handling areas. Centralized de-dusting system i.e. collection of fugitive emissions through suction hood shall be provided and subsequent treatment through bag filter or any other device and finally emitted through a stack of appropriately designed height, as prescribed above. :
- Fume Treatment Plant (FTPs bag filters have been provided in Smelting process. Dust collection and suppression system have been provided at different dust generating sources of Smelter.
- Control of fugitive emission in CPP is ensured by, central dedusting system with suction hoods and bag filter has been provided in the crusher houses of CHP. Dust suppression systems have been provided in the railway siding, coal yard, ash silo area, ash transporting road and all other vulnerable areas of fugitive dust emission. Bag filters have been provided in crusher houses of CHP & ash silos. Proper ash conditioning is ensured before ash unloading from ash silo to prevent the fugitive dust emission. Frequent sprinkling in regular intervals is carried out on the ash and coal transportation road.
- (ix) Fugitive Fluoride emissions from the Pot room shall not exceed 0.4 Kg/Ton of Aluminium produced. Fugitive emissions, especially in the work zone area, product and raw materials storage area etc. shall be regularly monitored and records be maintained. The emissions shall conform to the limits imposed by the State Pollution Control Boards / Central Pollution Control Board. :
- The fugitive fluoride emission from the pot room is remaining within 0.4 Kg/ MT of aluminium produced, for strict adherence to the SOPs. Regular monitoring of fugitive emission in the work zones is being carried out and record maintained. The fluoride emission is being monitored regularly and reporting to State Pollution Control Board.
- (x) Windbreakers shall be installed to restrict fugitive dust :
- Boundary wall of sufficient height provided to Smelter, Power & FRP to restrict the fugitive dust. Extensive sprinkling, at potential source of generation, is being carried out through fixed and mobile sprinklers to contain the fugitive dust.



- (xi) The water requirement for the expansion project shall not exceed 69,600 KLD and shall be sourced from the Hirakud reservoir : The raw water for the all the three plants, i.e. Smelter, Power and Flat Rolled Plant is being sourced from Hirakud reservoir. Total raw water withdrawal from the reservoir for the period is 3978398 KL @21740 KLD.
- (xii) Waste water generation shall not exceed 14,250 KLD for the expansion project. Waste water generated from smelter shall be treated in Rotating Biological Contactor and shall be reused in the plant. Cooling water blow down from the power plant shall be treated up to discharge standards and discharged into Kharjhor nalla. : The waste water generation from all the units is remaining below 14250 KLD.
- The waste water generated from Smelter is being treated in three effluent treatment plants (ETPs) of capacity 250KLD, 250KLD and 50KLD and reused back in cooling tower. The earlier existing Rotating Biological Contractor (RBC) has been replaced with RO based 250 KLD ETP. The cooling tower blow-down water of CPP is being treated through RO Plant and reused for cooling. Other effluents are being treated to meet the standards before reuse in various in-house activities and cooling towers. No waste water is discharged to outside, especially in dry seasons as per the CTO of SPCB.
- Waste water generated from FRP Plant is being treated at ETP Integrated with RO Capacity of 120 KLD.
- The domestic waste water of three plants is treated in STPs of capacities 500KLD, 400KLD, 300KLD & 2 x 100KLD. The treated water of these STPs is reused inside plants.
- Monitoring of water quality is being carried out regularly and the same is enclosed for the period April'20 to September' 20.
- (xiii) 7650 TPA of solid waste generated, mainly the spent pot lining from smelter shall be disposed of in a secured landfill site inside the premises. The SLF shall be as per CPCB guidelines. 2.55 million TPA of coal ash generated from power plant shall be disposed as dry ash mounds. However, it shall be ultimately disposed of as backfill material in abandoned coal mines or shall be utilized as per the Fly Ash Notification 5.0.763 (E) dated 14.9.1999 of this Ministry. The proposed Amendment / revision : The carbon content of spent pot lining is disposed to authorized agency and the non-carbon (refractory) content is stored in close roof sheds with concrete platform. The aluminium dross generated in the process of Smelter is reprocessed inside the plant and also disposed to authorized vendors for reprocessing. The used anode butts are being sent to nearby sister concern Aditya Aluminium for conversion to green anode which is again used in our plant. Other solid wastes from



to this Notification shall be applicable for compliance from the Project Authority

Smelter Plant, which are hazardous in nature, are disposed at the TSDF and other registered recyclers/re-processors. The captive SLF, designed as per the CPCB guideline, is used especially for disposal of wastes in emergency.

Coal ash, the solid waste generated from the process in CPP, is supplied to brick manufacturers, cement plants, low lying area filling, road making etc. Left over ash if any remains is sent to ash mound in conditioned form.. During the period April 2020 to September 2020, about 451234.90 MT of ash was generated from CPP out of which 359008.19 MT of ash utilized into various avenues. The average utilization figure of 79.56 % for the period from April 20 to Sep 20. The ash generation and utilization is enclosed.

After de-allocation of captive mine at Talabira of Sambalpur district in Odisha, disposal in abandoned pits of other coal mines is being explored.

- (xiv) Minimum Cycle of Concentration (COC) for the CPP shall be 5.0 : The COC is being maintained at around 5.0 in all the operating units of CPP.
- (xv) Minimum of 33 % of total land area shall be developed as green belt with local species in consultation and as per the CPCB's guidelines : 33% of total land area including solid waste disposal sites has been green covered. The details of plantation are enclosed.
- (xvi) All the recommendations made in the Charter on Corporate Responsibility for Environment Protection (CREP) for the Aluminium Sector shall be strictly implemented. : All the recommendations of Charter of Corporate Responsibility for Environment for aluminium sector are being strictly implemented.
- (xvii) The project authorities shall earmark Rs.369 crores to implement the conditions stipulated by the Ministry of Environment and Forests as well as the State Government along with the implementation schedule for all the conditions stipulated herein. The funds so provided shall not be diverted for any other purpose. : Being complied.

**B. GENERAL CONDITIONS :**

- (i) The project authorities shall strictly adhere to the stipulations made by the State Pollution Control Board : We are adhering to the directions of State Pollution Control Board.





- (ii) No further expansion or modifications in the plant shall be carried out without prior approval of the Ministry of Environment and Forests. In case of deviations or alterations in the project proposal from those submitted to this Ministry for clearance, a fresh reference shall be made to the Ministry to assess the adequacy of conditions imposed and to add additional environmental protection measures required, if any. : No further expansion or modifications in the plant shall be carried out without prior approval of MoEF&CC.
- (iii) Regular monitoring of ambient air for SPM, RSPM, SO<sub>2</sub>, NO<sub>x</sub>, CO, HC and Fluoride shall be carried out as per CPCB guidelines. The locations of ambient air quality monitoring stations shall be reviewed in consultation with the State Pollution Control Board (SPCB) and additional stations shall be installed, if required, in the downwind direction as well as where maximum ground level concentrations are anticipated. : The ambient air quality is being monitored at seven locations of Smelter, eight locations in core & buffer zones of CPP regularly.  
For the online real time monitoring of ambient air quality 2 stations installed inside Smelter premise, 3 in CPP premise. The real time data is being transmitted to server of SPCB & CPCB continuously.
- (iv) Data on ambient air quality, fugitive emissions and stack emissions should be regularly submitted to the concerned Regional Office of this Ministry and SPCB/CPCB every six months and posted on the Website of the Project Authority : Data on ambient air quality, fugitive emissions, stack emissions and water effluent quality is being regularly submitted to Eastern Regional Office through six monthly compliance reports. The data for the period April'20 to September'20 are enclosed. The six monthly compliance report is posted in company's website.
- (v) Industrial waste water shall be properly collected and treated so as to conform to the standards prescribed under GSR422 (E) dated 19<sup>th</sup> May 1993 and 3rd December, 1993 or as amended from time to time : Waste water is properly collected, treated to conform to the standards and entirely reused in various processes. Data on water effluent quality is enclosed for kind reference.
- (vi) The project authorities shall strictly comply with the rules and guidelines under Manufacture, Storage and Import of Hazardous Chemicals Rules, 1989 as amended in October, 1994 and January, 2000 and Hazardous Waste (Management and Handling) Rules, 1989, as amended from time to time. Authorization from the SPCB shall be obtained for collection, treatment, storage, and disposal of hazardous wastes. All Transportation of Hazardous Chemicals shall be as per the MVA, 1989 : Authorization for Management and Handling of Hazardous Waste has been obtained from State Pollution Control Board for Smelter, CPP and FRP. Conditions stipulated in the authorizations are being strictly followed as per Hazardous Waste (Management, Handling and Transboundary Movement) Rule 2016 and its amendments time to time.
- (vii) The overall noise levels in and around the plant area shall be kept well within the standards by providing : Overall noise level is kept within standards by providing adequate noise control



noise control measures including acoustic hoods, silencers, enclosures etc. on all sources of noise generation. The ambient noise levels shall conform to the standards prescribed under Environment (Protection) Act, 1986 Rules, 1989 viz. 75 dBA (day time) and 70 dBA (night time)

measures, wherever practicable. High noise areas have been provided with visual displays for use of PPEs.

Noise quality in and around the plants is being monitored regularly. These are confirming to the standards prescribed under Environment (Protection) Act, 1986.

The noise level data for the period April'20 to September'20 is enclosed for reference.

- |        |  |   |  |
|--------|--|---|--|
| (viii) | Occupational health surveillance of the workers shall be carried out on a regular basis and records shall be maintained as per the Factories Act.  | : | Occupational health surveillance of all the employees is being carried out on a regular basis and records are maintained.  |
| (ix)   | Training shall be imparted to all employees on safety and health aspects of chemicals handling. Pre-employment and routine periodical medical examinations for all employees shall be undertaken on regular basis  | : | Regular training is being imparted to all the employees on various safety, health and environmental issues.<br><br>Pre-employment and routine periodical medical examinations for all employees are being undertaken on regular basis.<br><br>For the period April'20 to September'20 the health surveillance statistics are as follows:<br><br>Pre-employment health surveillance against new recruitment- 538<br><br>Periodic medical health surveillance for permanent employees- 41<br><br>Periodic medical health surveillance for contractual employees- 322 |
| (x)    | Usage of PPEs by all employees/ workers shall be ensured   | : | Use of PPEs by all the employees and workers are being strictly ensured in unit.   |
| (xi)   | The Company shall harvest surface as well as rainwater from the rooftops of the buildings proposed in the expansion project and storm water drains to recharge the ground water and use the same water for the various activities of the project to conserve fresh water | : | Studies by the Dept. of Civil Engineering, A.U College of Engineering, Andhra University, Visakhapatnam in 2007 and M/S Visiontek Services Pvt. Ltd, Bhubaneswar in 2012, recommend not to adopt rain water harvesting in Hirakud area for:<br><br>(i) Presence of shallow water table   |



- (ii) Hard rock at shallow depth  
 (iii) Water logging in the area and  
 (iv) Rising trend of the water table in the area
- We are exploring the feasibility study of rain water harvesting in nearby area.
- A fresh study on rain water harvesting is being carried out to explore the feasibility.
- (xii) The project proponent shall also comply with all the environmental protection measures and safeguards proposed in the EIA/EMP report. All the recommendations made in respect of environmental management and risk mitigation measures relating to the project shall be implemented. : We are complying with the environmental protection measures and safeguard proposed in the EIA/EMP. All the recommendations made in respect of environmental management and risk mitigation measures relating to the project shall be implemented.
- (xiii) The company will undertake all relevant measures, as indicated during the Public Hearing for improving the Socio-economic conditions of the surrounding area. CSR activities will be undertaken by involving local villages and administration : The company is undertaking various socio-economic development projects in the surrounding areas involving local SHGs. The CSR activities for the period April'20 to September'20 is enclosed for reference.
- (xiv) The company shall undertake eco-developmental measures including community welfare measures in the project area for the overall improvement of the environment. The eco-development plan should be submitted to the SPCB within three months of receipt of this letter for approval : The company is undertaking various community development programs in and around Hirakud involving local SHGs. Various welfare measures are undertaken.
- During April'20 to September'20 about Rs. 55.94 Lakhs have been spent towards community development projects including rural periphery development at Hirakud Complex.
- (xv) A separate Environmental Management Cell equipped with full-fledged laboratory facilities shall be set up to carry out the Environmental Management and Monitoring functions. : A separate Environmental Management Cell with adequate laboratory facility has been set up at Hirakud Complex, to carry out environmental management and monitoring functions.
- (xvi) The implementation of the project vis-a-vis environmental action plans shall be monitored by the concerned Regional Office of the Ministry/ SPCB / CPCB. A six monthly compliance status report shall be submitted to monitoring agencies and shall be posted on the Website of the Company. : Strictly followed.



- (xvii) The project proponent shall inform the public that the project has been accorded environmental clearance by the Ministry and copies of the clearance letter are available with the SPCB/ Committee and may also be seen at Website of the Ministry at <http://envfor.nic.in>. This shall be advertised within seven days from the date of issue of the clearance letter, at least in two local newspapers that are widely circulated in the region of which one shall be in the vernacular language of the locality concerned and a copy of the same shall be forwarded to the concerned Regional Office of the Ministry. : Public was informed through advertisements in three widely circulated regional newspapers namely :
- (1) The Dharitri, Dated 12<sup>th</sup> February, 2008
- (2) The Agnisikha, Dated 12<sup>th</sup> February, 2008 &
- (3) The Sambad, Dated 14<sup>th</sup> February, 2008,
- This was also communicated to the Regional Office of MOEF, Bhubaneswar vide our letter of 14<sup>th</sup> February, 2008 along with copies of the newsletters.
- (xviii) The project authorities shall inform the Regional Office as well as the Ministry, the date of financial closure and final approval of the project by the concerned authorities and the date of start of the project. : Complied.
- (xix) The Ministry may revoke or suspend the clearance, if implementation of any of the above conditions is not satisfactory. : Agreed



## **Amendment Letter: J - 11011/144/2006-IA II (I), dated 19 October, 2009**

<b>Sl. No</b>	<b>CONDITIONS</b>	<b>STATUS AS ON 30<sup>th</sup> September 2020</b>
3.0.1	All the specific and general conditions shall remain unchanged and have to be complied in toto and pari passu.	: Being complied
2	There shall be no change or modification in the ultimate capacity of the Smelter Plant (1,00,000 to 3,60,000 TPA) and Captive Power Plant (267.5 MW to 967.5 MW).	: There will be no change or modification of the ultimate capacity of Smelter Plant as well as Captive Power Plant without prior intimation and clearance from MOEF & CC.
3	All the emissions (ambient air, stack, fugitive and fluoride emissions) shall be within the permissible limit as prescribed in the Environmental Clearance dated 6 <sup>th</sup> February, 2008.	: All the emissions are within the prescribed limit. Monitoring reports are enclosed
4	No additional land shall be acquired.	: No additional land will be acquired for expansion.
5	No additional water shall be used.	: No additional water, other than the quantity mentioned in the EC, will be used.
6	A copy of clearance letter shall be sent by the proponent to concerned Panchayat Zilla Parishad / Municipal Cooperation, Urban local body and the local NGO, if any, from whom suggestions / representations if any were received while processing the proposal. The clearance letter shall also be put on the website of the company by the proponent.	: Copy of the clearance letter was submitted to local Urban local body after receiving the same.
7	The project proponent shall upload the status of compliance of the stipulated environment clearance conditions, including results of monitored data on their web site and shall update the same periodically. It shall simultaneously be sent to the Regional Office of the MOEF at Bhubaneswar, the respective Zonal office of CPCB and the OPCB. The criteria pollutant levels namely; SPM, RSPM, SO <sub>2</sub> , NO <sub>x</sub> (ambient levels as well as Stack emissions) or critical sectorial parameters, indicated for the projects shall be monitored and displayed at a convenient location near the main gate of the company in the public domain.	: The six monthly report of compliance of conditions of the Environment Clearance is submitted to Regional Office of Ministry of Environment & Forests & Climate Change (MoEF&CC), Bhubaneswar regularly in form of both soft and hard copies. The same is also uploaded in the website of the company. Critical sectorial environmental parameters are displayed in the main gates of both Smelter and Power Plant.
8	The project proponent shall also submit six monthly reports on the status of compliance of the stipulated environment clearance conditions, including results of monitored data (both in hard copies as well as by e-	: Six monthly compliance of Environment Clearance (EC) conditions is submitted to the Regional Office of Ministry of Environment & Forests & Climate Change



- mail) to the regional office of MOEF at Bhubaneswar, the respective Zonal office of CPCB and the OPCB. The Regional Office of this Ministry at Bhubaneswar / CPCB/ OPCB shall monitor the stipulated conditions. (MoEF&CC), Bhubaneswar regularly in form of soft copies.
- 9 The environmental statement for each financial year ending 31<sup>st</sup> March in Form-V as is mandated to be submitted by the project proponent to the concerned State Pollution Control Board as prescribed under the Environment (Protection) Rules, 1986 as amended subsequently, shall also be put on the website of the company along with the status of compliance of environmental conditions and shall also be sent to the respective Regional Office of the MoEF by e-mail. : Being complied.
- 4.0 This letter is issued with prior approval from the Competent Authority. : Agreed
- 5.0 This letter shall be kept with the environment clearance issued by the Ministry vide letter No.:J-11011/100/2006-IA.II(I), dated 6<sup>th</sup> February, 2008. : Complied.



## COMPLIANCE TO ENVIRONMENT CLEARANCE (EC) CONDITIONS

**Name of the Project: EXPANSION OF SMELTER PLANT FROM 65 KTPA TO 100 KTPA BY RELOCATION OF POTS FROM BELGAUM AT HIRAKUD**

**Clearance no. & Date: J 11011/53/2004-IA II (I), dated : July 14, 2005**

**Compliance Period: April 2020 - September 2020**

Sl. No.	Clearance Condition	Compliance Status as on 30 <sup>th</sup> September, 2020
1.0	<p>This has reference to your communication No. Nil dated 2nd April 2004 along with application, EIA/EMP and related project documents, CD and subsequent clarifications furnished by you vide your letters dated 9th March, 2005 and 25th May, 2005 for environmental clearance on the above mentioned project. The Ministry of Environment and Forests has examined your application. It is noted that proposal involves expansion of alumina smelter plant capacity from 65 to 100 KTPA by adopting HSS technology.</p> <p>Land area required for the project is 13.5 ha. of which 11.48 ha. is for the existing plant. The project does not involve diversion of forest land and displacement of people. Water requirement would increase of 1079 m<sup>3</sup>/d to 1278 m<sup>3</sup>/d after the proposed expansion. Additional 200 m<sup>3</sup> /d of water requirement will be met from cooling tower blow down from captive power plant (CPP) except for the drinking water. Water requirement will be met from the Hirakud reservoir. Orissa State Irrigation Department has given permission for drawl of 10 cusec of water from Hirakud Dam. Public hearing panel has considered the project in the meeting held on 21.12.2004. The Orissa State Pollution Control Board has granted NOC on 9.3.2005. Total cost of the project is Rs.232 crores.</p>	<p>The expansion was based on HSS technology involving relocation of pots from Belgaum unit. The technology was later converted to prebake one.</p> <p>The project did not involve diversion of forest and displacement of people.</p> <p>Water requirement of the project is met from recycle water from outlet of ETP.</p> <p>Raw water is sourced from Hirakud Dam reservoir at CPP. Approval has been accorded by the Department of water resources, Govt. of Odisha of 14 cusec water from Hirakud Dam.</p>
2.0	<p>The Ministry of environment and Forests hereby accords environmental clearance to the above project under the provisions of EIA</p>	Agreed.



Sl. No.	Clearance Condition	Compliance Status as on 30 <sup>th</sup> September, 2020
	Notification dated 27th January 1994 as amended subsequently subject to strict compliance of the following specific and general conditions:	
A.	<b>SPECIFIC CONDITIONS:</b>	
i.	<p>The gaseous emissions from various process units shall conform to the standards prescribed from time to time. The State Board may specify more stringent standards for the relevant parameters keeping in view the nature of the industry, its size and location. At no time the emission level should go beyond the prescribed standards. In the event of failure of any pollution control system adopted by the unit, the respective unit should not be restarted until the control measures are rectified to achieve the desired efficiency.</p> <p>Ambient air quality monitoring stations should be set up in consultation with the Orissa Pollution Control Board. Data should be regularly monitored and records maintained and report submitted to the Ministry/CPCB/SPCB once in six months.</p>	<p>FTP (dry scrubbers) has been installed for the emission from the Smelting process to meet the standards prescribed by MoEF&amp;CC and State pollution control Board. We are regularly monitoring the particulate and fluoride emission from the FTP outlet and the fugitive fluoride from the pot rooms. The results are being submitted to SPCB/CPCB/MOEF&amp;CC regularly.</p> <p>Ambient air quality stations are set up and regularly monitored and results are reported to SPCB every month and MoEF&amp;CC in six monthly report.</p>
ii.	<p>There shall be no discharge of process effluent. As reflected in the EIA/EMP report, there shall be zero effluent discharge from the smelter plant. In addition, efforts shall be made to re-use waste water from the existing plant. Wastewater from the domestic effluent after treatment in Sewage Treatment Plant shall conform to the prescribed standards. The treated effluent shall be used for green belt development.</p>	<p>RO based ETPs (2 X 250 KLD, 1 X 50 KLD capacities) have been installed for treatment of waste water from Smelter Plant. All the treated waste water is reused in the Plant. STPs of configurations 1 X 500 KLD, 1 X 400 KLD, 1 X 300 KLD and 1 X 100 KLD have been provided for treatment of sewage water from canteen, toilets &amp; colony for both Smelter &amp; CPP at Hirakud.</p>
iii.	<p>In plant, control measures for checking fugitive emissions from spillage/raw materials handling shall be provided. Fluoride emissions shall be monitored from the existing pot room, proposed pot room and in the forage around the smelter complex and the data submitted regularly to the Ministry/RO Bhubaneswar and SPCB. Further, dry scrubbing system to control the emissions</p>	<p>Pre-baked technology has been adopted to reduce the fugitive fluoride emissions. Monitoring of fluoride emission from pot rooms and forage fluoride around smelter complex is being done regularly and data is submitted to the Ministry/RO, Bhubaneswar and SPCB.</p> <p>We have already converted all our HSS pots to prebake with dry scrubbing system and</p>





Sl. No.	Clearance Condition	Compliance Status as on 30 <sup>th</sup> September, 2020
	from the pot lines shall be provided. The fluoride emissions shall not exceed 0.8 kg/t of aluminium produced in the proposed expansion. In the existing plant, the fluoride emission level of 0.8 kg of aluminium produced shall be met by December 2008. Further, the pot emissions through fume treatment plant shall not exceed 0.30 kg/tons of aluminium produced.	present fluoride emission is within the stipulated norms. The emissions from stack and fugitive are within limit.
iv.	Fugitive fluoride emissions from the pot rooms shall not exceed 0.4 kg./MT of aluminium produced. Fugitive emissions shall be monitored and report submitted regularly to Ministry/RO, Bhubaneswar and SPCB.	As stated in our addendum to the EIA, the fugitive fluoride emissions from pot rooms shall not exceed 0.4 kg./MT of aluminium produced. Fugitive fluoride is being monitored and reported to ministry /RO and SPCB.
v.	Solid waste generated from the smelter plant will be spent pot lining (2200 TPA), used oil (3 KLPD) and used batteries. The spent pot lining generated from the smelter shall be properly treated and disposed off as per CREP's recommendations.	SPL is stored inside the covered sheds on concrete floor, as per the authorization from OSPCB. The Carbon portion being sent to authorized third party for disposal & the Non carbon portion is stored inside the storage shed. The used oil is being sent to authorize recycler. Used batteries are being returned to suppliers on buy back.
vi.	A green belt of adequate width and density shall be developed within and around the plant premises as per the CPCB guidelines.	Plantation has been done in the periphery, in vacant areas inside the plant, in surrounding area of Hirakud township and on ash disposal sites. Experienced professionals has been engaged for plantation and maintenance of the green belt. Around 445 sapling have planted in the year 2020-21.
vii.	Occupational Health Surveillance of the workers shall be done on a regular basis and records maintained as per the Factories Act.	Periodic medical surveillance tests are being done and recorded. During the year 2020-21 (April-20 to September-20), we have conducted following occupational health surveillance. - Pre–employment health surveillance against new recruitment- 538 - Periodic medical health surveillance for permanent employees- 41 - Periodic medical health surveillance for contractual employees- 322



Sl. No.	Clearance Condition	Compliance Status as on 30 <sup>th</sup> September, 2020
viii.	Company shall undertake rain water-harvesting measures to recharge the ground water and action plan in this regard should be submitted to the Ministry.	Studies by the Dept. of Civil Engineering, A.U College of Engineering, Andhra University, Visakhapatnam in 2007 and M/S Visiontek Services Pvt. Ltd, Bhubaneswar in 2012, recommend not to adopt rain water harvesting in Hirakud area for: <ul style="list-style-type: none"> <li>(i) Presence of shallow water table</li> <li>(ii) Hard rock at shallow depth</li> <li>(iii) Water logging in the area and</li> <li>(iv) Rising trend of the water table in the area.</li> </ul> We are exploring the feasibility study of rain water harvesting in nearby area.
ix	All the recommendations made in the Charter of Corporate Responsibility for Environment protection (CREP) for the aluminium sectors shall be strictly implemented	We will strive to implement the recommendations of CREP. Compliance to CREP recommendations is attached ( <b>Annexure-I</b> ).
<b>B.</b>	<b>GENERAL CONDITIONS:</b>	
Sl.No.	Clearance Condition	Compliance Status as on 30 <sup>th</sup> September, 2020
i.	The project authorities must strictly adhere to the stipulations made by the Orissa Pollution Control Board and the State Government.	Being complied.
ii.	No further expansion or modifications in the plant should be carried out without prior approval of the Ministry of Environment and Forests.	Being complied. No further expansion or modifications have been planned.
iii.	Adequate ambient air quality-monitoring stations shall be established in the downward direction as well as where maximum ground level concentration of SPM, SO <sub>2</sub> and NO <sub>x</sub> are anticipated in consultation with the State Pollution Control Board. Data on ambient air quality, fugitive emission and stack emissions should be regularly submitted to this Ministry including its Regional Office at Bhubaneswar	Ambient air monitoring stations have been installed. The ambient air quality, fugitive fluoride and stack emissions are done as stipulated and the data are regularly submitted to the SPCB every month. The same is submitted to ministry's regional office at Bhubaneswar and the Central Pollution Control Board at least once in six months.



Sl. No.	Clearance Condition	Compliance Status as on 30 <sup>th</sup> September, 2020
	and the State Pollution Control Board/ Central Pollution Control Board once in six months.	
iv.	Industrial wastewater shall be properly collected, treated as to conform to the standards prescribed under GSR 422 (E) dated 19th May, 1993 and 31st December, 1993 or as amended from time to time. The treated wastewater should be utilized for plantation purpose.	RO based ETPs (two of 250 KLD capacity and one of 50 KLD capacity) have been installed. and Four STPs (500 KLD, 100 KLD, 400 KLD, 300 KLD capacities) have been provided for treatment of sewage water from canteen, toilets & colonies of Hirkud Complex. The treated water is being recycled and reused inside the plant.
v.	The overall noise levels in and around the plant area should be kept well within the standards (85 dBA) by providing noise control measures including acoustic hoods, silencers, enclosures etc. on all sources of noise generation. The ambient noise levels should conform to the standards prescribed under EPA Rules, 1989 viz. 75 dBA (day time) and 70 dBA (night time).	Noise control measures have been provided at the source of generation. The ambient noise level is within the prescribed limit and the data is being reported in six monthly compliance report.
vi.	M/s Hindalco shall comply with the Hazardous Waste (Management & handling) Rule, 2003 and Hazardous Chemicals Rules, 2000 and amendments there under.	Being Complied as per Hazardous and Other Wastes (Management and Trans boundary Movement) Rules, 2016.
vii.	The project proponent shall also comply with all the environmental protection measures and safeguards recommended in the EIA / EMP report. Further, the company must undertake socio-economic development activities in the surrounding villages like community development programs, educational programs, drinking water supply and health care etc.	We have already initiated several socio-economic development activities in the surrounding villages like community development programs, educational programs and health care, multi-cropping etc. About Rs. 55.94 Lakhs have been spent at Hirkud complex towards community development projects including periphery development during April 2020 to September 2020.
viii.	The project authorities will provide adequate funds both recurring and non-recurring to implement the conditions stipulated by the Ministry of Environment and Forests as well as the State Government along with the implementation schedule for all the conditions stipulated herein. The funds so	As stated in the EIA report, funds are being allocated for addressing the environmental issues and to implement the conditions stipulated by the Ministry of Environment and Forests, as well as the State Government. These funds have not been diverted for any other purpose.



Sl. No.	Clearance Condition	Compliance Status as on 30 <sup>th</sup> September, 2020																																		
	provided should not be diverted for any other purposes.																																			
ix.	The regional Office of this Ministry at Bhubaneswar/Central Pollution Control Board / State Pollution Control Board will monitor the stipulated conditions. A six monthly compliance report and the monitored data along with statistical interpretation shall be submitted to them regularly.	Six monthly compliance report is being submitted regularly to the Regional Office of MoEF &CC along with data of environmental monitoring.																																		
x.	The Project Proponent shall inform the public that the project has been accorded environmental clearance by the Ministry and copies of the clearance letter are available with the State pollution Control Board/ Committee and may also be seen at Website of the Ministry of Environment and Forests at <a href="http://envfor.nic.in">http://envfor.nic.in</a> . This should be advertised within seven days from the date of issue of the clearance letter, at least in two local newspapers that are widely circulated in the region of which one shall be in the vernacular language of the locality concerned and a copy of the same shall be forwarded to the Regional Office.	Complied.																																		
xi.	The project Authorities shall inform the Regional Office as well as the Ministry, the date of financial closure and final approval of the project by the concerned authorities and the date of commencing the land development work.	<table border="1"> <thead> <tr> <th data-bbox="997 1274 1149 1391">Projects</th> <th data-bbox="1155 1274 1227 1391">Pots</th> <th data-bbox="1233 1274 1337 1391">Project Start</th> <th colspan="2" data-bbox="1343 1274 1528 1328">Capitalization</th> </tr> <tr> <td></td> <td></td> <td></td> <th data-bbox="1343 1328 1431 1391">Start Month</th> <th data-bbox="1431 1328 1528 1391">End Month</th> </tr> </thead> <tbody> <tr> <td data-bbox="997 1391 1155 1576">Expansion from 100 Ktpa to 146 Ktpa by retrofit existing pots with prebake Tech.</td> <td data-bbox="1155 1391 1227 1576">481</td> <td data-bbox="1233 1391 1337 1576">May-05</td> <td data-bbox="1343 1391 1431 1576">Feb-07</td> <td data-bbox="1431 1391 1528 1576">Mar-09</td> </tr> <tr> <td data-bbox="997 1576 1155 1715">Addition of 36 no's 85kA prebake pots(146-155 ktpa)</td> <td data-bbox="1155 1576 1227 1715">36</td> <td data-bbox="1233 1576 1337 1715">Apr-08</td> <td data-bbox="1343 1576 1431 1715">Jan-09</td> <td data-bbox="1431 1576 1528 1715">Jul-09</td> </tr> <tr> <td data-bbox="997 1715 1155 1854">Addition of 28 nos 85kA prebake pots (155-161.4 Ktpa)</td> <td data-bbox="1155 1715 1227 1854">28</td> <td data-bbox="1233 1715 1337 1854">Aug-09</td> <td data-bbox="1343 1715 1431 1854">Jul-09</td> <td data-bbox="1431 1715 1528 1854">Dec-10</td> </tr> <tr> <td data-bbox="997 1854 1155 1930">Addition of of 10 nos 85kA prebake</td> <td data-bbox="1155 1854 1227 1930">10</td> <td data-bbox="1233 1854 1337 1930">Dec-10</td> <td data-bbox="1343 1854 1431 1930"></td> <td data-bbox="1431 1854 1528 1930">Nov-12</td> </tr> </tbody> </table>	Projects	Pots	Project Start	Capitalization					Start Month	End Month	Expansion from 100 Ktpa to 146 Ktpa by retrofit existing pots with prebake Tech.	481	May-05	Feb-07	Mar-09	Addition of 36 no's 85kA prebake pots(146-155 ktpa)	36	Apr-08	Jan-09	Jul-09	Addition of 28 nos 85kA prebake pots (155-161.4 Ktpa)	28	Aug-09	Jul-09	Dec-10	Addition of of 10 nos 85kA prebake	10	Dec-10		Nov-12				
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Sl. No.	Clearance Condition	Compliance Status as on 30 <sup>th</sup> September, 2020				
		pots(161.4-163.7 Ktpa)				
		80 nos. 235 kA prebake pots (163.7 Ktpa to 215.3 ktpa)	80	Jun-09	Aug-13	Oct-14
3.0	The Ministry may revoke or suspend the clearance, if implementation of any of the above conditions is not satisfactory.	Agreed				
4.0	The Ministry reserves the right to stipulate additional conditions if found necessary. The Company in a time bound manner will implement these conditions.	Agreed				
5.0	The above conditions will be enforced, inter-alia under the provisions of the Water (Prevention & Central of Pollution) Act, 1974, the Air (Prevention & Control of Pollution) Act, 1981, the Environment (Protection) Act, 1986, Hazardous Wastes (Management and Handling) Rules, 2003 and the Public Liability Insurance Act, 1991 along with their amendments and rules.	Agreed				



ANNEXURE- I

**HIDALCO HIRAKUD SMELTER  
COMPLIANCE TO CREP GUIDELINES**

Action Points	Targets	Status As on 30 <sup>th</sup> September 2020
1. <b>Technology</b> Allowing new potlines only with pre-baked technology.	Clearance by MoEF only for pre-baked after June 2003.	Complied. The expansion of smelter capacity through adopting modern state of the art prebake technology.
2. <b>Fluoride emissions</b> (i) Prescribing Max. plant size.	To be decided based on assimilative capacity of plant location.	
(ii) Revision of Fluoride emission standard.	Soderberg 2.8 kg/t by Dec 2005 1.0 kg/t (VSS) & 1.30 kg/t (HSS) by Dec 2010. Pre-baked 0.8 kg/t	Being complied applicable to Pre-baked technology.
(iii) Phasing out wet scrubbing system for fluoride	By December 2006.	Completed
(iv) Allowing new potlines only with dry scrubbing system.	Clearance by MoEF only for dry scrubber system, after June 2003	We have dry scrubbing system (4 No. FTPs) for all our pot lines.
(v) Fugitive Emissions monitoring from pot rooms	Monitoring data to be submitted to CPCB/SPCBs from January 2004.	We have been submitting the data to both CPCB/SPCB and also to MoEF&CC Regional Office at Bhubaneswar vide six monthly compliance reports.
3. <b>Fluoride Consumption</b> Prescribing fluoride consumption per tonne of aluminium produced (Guidelines)	For Soderberg 15 kg/t by Dec 2005.  For pre-baked 10 kg/t by Dec 2005.	-  Complied.



4.	<b>Ambient Fluoride</b> (i) Forage fluoride std.	- 12 consecutive months average 40 ppm. - 2 consecutive months average 60 ppm. - One month 80 ppm.	Forage analysis is regularly carried out on monthly basis and all the values are within stipulated standards.
	(ii) Forage fluoride measurement	To start monitoring and submit data from Jan 2004.	The data is being regularly submitted to CPCB/SPCB
5.	<b>Spent Pot Lining (SPL)</b> (i) Setting up individual SPL treatment facility	Target dates to be submitted by industries.	Exploring to otherwise use SPL in cement plants and CPP boilers.
	(ii) Limit for pot life (new pots installed after Dec 31, 2003).	2500 days (average).	-
	(iii) SPL (Carbon and Refractory) disposal in secured landfill.	With immediate effect.	We are storing SPL inside the concrete floor covered shed and the as per the authorization from OSPCB. The Carbon portion being sent to authorized third party & the Non carbon portion is stored inside the storage sheds.
6.	<b>Red Mud</b> (i) Phasing out wet disposal	To achieve min. 50% solids in Red Mud by Dec 2005.	Not applicable
	(ii) Red Mud utilization	To be proposed by the Aluminium Association of India.	
7.	<b>Anode Baking Oven</b>	Achieve PM limit of 50 mg/Nm <sup>3</sup> by Dec 2005.	Not applicable



## COMPLIANCE TO ENVIRONMENT CLEARANCE (EC) CONDITIONS

**Name of the Project: EXPANSION OF SMELTER PLANT AT HIRAKUD FROM 30 KTPA TO 65 KTPA.**

**Clearance No & Date: J-11011/42/2000-IA II, dated; 10<sup>th</sup> JANUARY 2001**

**Compliance Period: April 2020 – September 2020**

Sl. No.	Condition	Compliance Status as on 30th September 2020
<b>SPECIAL CONDITIONS:</b>		
i.	The gaseous emissions [SO <sub>2</sub> , NO <sub>x</sub> , Fluoride, Coal tar pitch volatiles (CTPV)] and particulate matters, from various process units should conform to the standards prescribed by the concerned authorities from time to time. At no time, the emission level should go beyond the stipulated standards. In the event of failure of pollution control system(s) adopted by the unit, the respective unit should not be restarted until the control measures are rectified to achieve the desired efficiency.	<p>The standards stipulated for various emissions are being strictly followed. Monitoring of particulates matter and fluoride at outlets of FTPs (Dry Scrubber) and fugitive fluoride from pot rooms are carried out every month in smelter. Particulate matter, Sox and NO<sub>x</sub> are also monitored from the stacks of cast houses. The height of the stacks is designed as the guidelines.</p> <p>We have converted all our HSS pots to prebake and the prebake anode requirement is met through our sister plant M/s Aditya Aluminum, Lapanga. We do not have the green anode and anode baking plant, hence the CTPV emission due to this is eliminated.</p>
ii.	A minimum of five ambient air quality monitoring stations should be set up based on the micro meteorological conditions as well as where maximum ground level concentration of SPM, SO <sub>2</sub> , NO <sub>x</sub> , Fluoride and volatiles are anticipated in consultation with the State Pollution Control Board. The data recorded should be submitted to the Regional Office at Bhubaneswar every six months and to the SPCB every three months.	<p>Ambient air stations are monitored and the results are reported to SPCB in progress report every month and to Regional Office, MoEF&amp;CC every six month. We monitor regularly forage fluoride in lieu of ambient air as per CREP recommendation. The ambient fluoride in all the locations were found below detectable limit during April'20 to Sept'20</p>





iii.	As reflected in EMP, the company should be installing state of art dry scrubber technology to bring down the fluoride emission from the present level of 4.25 kg/t Al. To 2.60 kg/t Al. (minimum). Fugitive emissions must be monitored and controlled by taking adequate measures including sealing of pots & hooding.	State-of-the-art technology dry scrubbing system has been installed in all the FTPs attached to the pot lines and the fluoride emission from all FTPs are within limit.  The stack and fugitive emissions are being monitored regularly and the data is submitted to Board in monthly progress report.
iv.	As dry process will be adopted there will be no generation of process effluent. The effluent from the utilities should be adequately treated to meet the norms prescribed for land disposal and should be regularly monitored before using it for irrigating the green belt.	At present RO based ETPs (two of 250 KLD capacity and one of 50 KLD capacity) have been installed for existing 216 KTPA Smelter.  Four STPs (500 KLD, 100 KLD, 400 KLD, 300 KLD capacities) have been provided for treatment of sewage water from canteen, toilets & colonies of the existing plant.
v.	The hazardous solid waste (spent pot linings) should be disposed off in a secured landfill site approved by the Orissa SPCB. The secured landfill site should be provided with impermeable HDPE lining and leachate collection facility. As the ground water table in the area is high the feasibility of vertical stacking of the spent pot lining also needs to be explored and a report submitted to the Ministry in three months.	Vertical stacking approved from OPCB Letter no.-4572 dated 13.03.2001). The carbon content of spent pot lining is disposed to authorized agency and the non-carbon (refractory) content is stored in covered shed with concrete platform. Captive Secured Landfill Facility (SLF), with impermeable HDPE lining and leachate collection facility with approval of OSPCB, has been provided for disposal of hazardous waste.
vi.	The fluoride levels in the ground water quality around the hazardous waste disposal site should be regularly monitored for fluoride and data recorded to ensure there is no contamination of ground water.	Fluoride in ground water is monitored near hazardous waste (sludge) disposal site and the results are reported to SPCB in progress report every month and to Regional Office, MoEF&CC every six month.
vii.	The project proponent shall also comply with all the environmental protection measures and safeguards recommended in the EIA and risk analysis report.	Complied



<b>General Conditions:</b>		
i.	The project authorities must strictly adhere to the stipulations made by the Orissa State Pollution Control Board and the State Government.	Stipulations from OSPCB or Govt. adhered.
ii.	No further expansion or modifications in the plant should be carried out without prior approval of the Ministry of Environment and Forests.	No further expansion or modifications planned now
iii.	The project authorities must strictly comply with rules and regulations under Manufacture, Storage and Import of Hazardous Chemicals Rules, 1989 as amended on 3rd October, 1994.	Being complied.
iv.	The project authorities must strictly comply with rules and regulations with regard to handling and disposal of hazardous wastes in accordance with the Hazardous Wastes (Management & Handling) Rules, 1989. Authorization from the State Pollution Control Board must be obtained for collections/treatment/storage/ disposal of hazardous wastes.	Compliance done as per Hazardous and Other Wastes (Management and Trans boundary Movement) Rules, 2016. Hazardous Waste Authorization has been obtained from State Pollution Control Board for collections/treatment/storage/disposal of hazardous wastes.
v.	Occupation health surveillance programme should be undertaken as regular exercise for all the employees, specifically for those engaged in handling hazardous substances.	Periodic medical surveillance tests are being conducted for all the employees including contractual employees regularly. During the year April-20 to September-20, we have conducted following occupational health surveillance.



Sl. No.	Condition	Compliance Status as on 30 <sup>th</sup> September 2020
		<ul style="list-style-type: none"> <li>- Pre –employment health surveillance against new recruitment- 538</li> <li>- Periodic medical health surveillance for permanent employees- 41</li> <li>- Periodic medical health surveillance for contractual employees- 322</li> </ul> <p>No significant abnormalities detected during regular screening of any employees. Treatment and advice was given for minor ailments detected during checkup.</p>
vi.	The overall noise levels in and around the plant area should be kept well within the standards (85 dBA) by providing noise control measures including acoustic hoods, silencers, enclosures etc. on all sources of noise generation. The ambient noise levels should conform to the standards prescribed under EPA Rules, 1989 viz. 75 dBA (day time) and 70 dBA (night time).	Complied. Noise control measures have been provided at source of generation. The ambient noise level is within prescribed limit and the data is being reported in Six monthly reports
vii.	The project proponent should have a scheme for social upliftment in the nearby village with reference to contribution in road construction, education of children, festivals, health centers sanitation facilities, drinking water supply, community awareness and employment to local people wherever possible both for technical and non-technical jobs.	We have several socio-economic development activities in the surrounding villages like community development, educational programs and health care, multi-cropping etc. About Rs. 55.94 lacs have been spent at Hirakud complex towards community development projects including rural periphery development during April 2020 to September 2020. We also give priority to the local employments.
viii.	Green belt of adequate width and density should be provided to mitigate the effects of fugitive emission all around the plant. A minimum of 25% of the total land acquired should be developed as green belt in consultation with the local DFO.	Plantation has been done in the periphery, in vacant areas inside the plant, in surrounding area of Hirakud township and on ash disposal sites. Experienced professionals has been engaged for plantation and maintenance of the green belt. Around 445 sapling have planted in the year 2020-21
ix.	A separate environmental management cell equipped with full-fledged laboratory facilities must be set up to carry out the environmental management and monitoring functions.	Separate Environmental Cell exists for Hirakud Complex with full-fledged laboratory facilities for environmental management and monitoring functions.



x.	The project authorities will provide adequate funds both recurring and non-recurring to implement the conditions stipulated by the Ministry of Environment and Forests as well as the State Government along with the implementation schedule for all the conditions stipulated herein. The funds so provided should not be diverted for any other purpose.	Being complied
xi.	The implementation of the project vis-à-vis environmental action plans will be monitored by Ministry's Regional Office at Bhubaneswar/State Pollution Control Board/Central Pollution Control Board. A six monthly compliance status report should be submitted to monitoring agencies.	Being complied Six monthly EC compliance is being submitted to the Regional Office of MoEF&CC regularly.
xii.	The project proponent should inform the public that the project has been accorded environmental clearance by the Ministry and copies of the clearance letter are available with the State Pollution Control Board/Committee and may also be seen at Web site of the Ministry of Environment and Forests at <a href="http://WWW.envfor.nic.in">http://WWW.envfor.nic.in</a> . This should be advertised in at least two local newspapers that are widely circulated in the region of which one shall be in the vernacular language of the locality concerned.	Complied.



xiii.	The project authorities should inform the Regional Office as well as the Ministry, the date of financial closure and financial approval of the project by the concerned authorities and the date of commencing the land development work.	<b>Projects</b>	<b>Pots</b>	<b>Project Start</b>	<b>Capitalization</b>	
					<b>Start Month</b>	<b>End Month</b>
		Expansion from 100 Ktpa to 146 Ktpa by retrofit existing pots with prebake Tech.	481	May-05	Feb-07	Mar-09
		Addition of 36 no's 85kA prebake pots(146-155 ktpa)	36	Apr-08	Jan-09	Jul-09
		Addition of 28 nos 85kA prebake pots (155-161.4 Ktpa)	28	Aug-09	Jul-09	Dec-10
		Addition of of 10 nos 85kA prebake pots(161.4-163.7 Ktpa)	10	Dec-10		Nov-12
80 nos. 235 kA prebake pots (163.7 Ktpa to 215.3 ktpa)	80	Jun-09	Aug-13	Oct-14		



## COMPLIANCE TO ENVIRONMENT CLEARANCE (EC) CONDITIONS

**Name of the Project** : **CAPTIVE POWER PLANT OF INDAL AT HIRKUD (Unit - I)**

**Clearance No. & Date** : **J -13011/18/88-IA, dated 11<sup>th</sup> May 1989**

**Compliance Period** : **April 2020 - September 2020**

Sl no	Condition	Compliance Status as on 30 <sup>th</sup> September 2020
<b>2(i)</b>	A single stack having minimum 130 meters height will be provided.	A single stack of height 130 meters has been provided to the unit.
<b>2(ii)</b>	Electrostatic precipitators [ESP's] having an operational efficiency of not less than 99.5% will be provided to keep the emission levels of the particulates within 150 mg/Nm <sup>3</sup> .	Two ESPs of efficiency more than 99.9% and with four electrical fields, have been provided to the boilers attached to the unit. The unit was under shut down during the period April'20 to September'20 for lesser power demand by Smelter Plant.
<b>2(iii)</b>	Dust suppressing/control equipment should be provided in the coal handling areas.	Fixed sprinklers, Rain Gun sprinklers have been provided to the coal yard for moistening of coal during handling. Mobile water tankers are used for sprinkling of water on the road around coal yard. Primary crusher houses of coal yard are fitted with dust suppression systems and the secondary crushers fitted with dust extraction systems with suction hoods & bag filter houses.
<b>2(iv)</b>	Liquid effluents emanating from the power station are treated to comply with the standards prescribed by the Central/State Pollution Control Board or under the Environment Protection Act, 1986, which ever are more stringent.	Cooling Tower blow downs of the plant is treated in a RO based ETP of capacity 120 m <sup>3</sup> /hr. Other effluents are collected in a Common Monitoring Basin and treated in the RO and is reused in the Cooling Towers, in-house activities such as coal-yard spraying, road cleaning, water spraying at ash disposal area and gardening etc.
<b>2(v)</b>	Cooling towers will be provided	Has been provided to the unit
<b>2(vi)</b>	Continuous monitoring of stacks and ambient air quality will be done at least at four different locations. The sites of	Continuous monitoring of ambient air and stacks is being done in all units of Power Plant with real time data transmission to the servers of SPCB and



these stations will be selected in consultation with State Pollution Control Board taking into consideration with the wind direction, human settlements and other local factors. Similarly monitoring facilities for liquid effluents may be provided.

**2(vii)** Adequate infrastructural facilities may be created for meeting the emergency situation arising due to fire hazards especially in the coal oil storage and handling areas.

**2(viii)** Adequate scrubbing system having an efficiency of not less than 90% efficiency for control of fluoride before the captive power plant comes on stream.

**2 (ix)** Disposal of fly ash on land should be done after making proper bunds/dykes. There should be no discharge of liquid effluents from ash bund/dyke. The liquid effluents if any should be recycled / reused. Efforts should be made to reuse utilize the fly ash for constructive purposes such as in making bricks, blocks, cement etc. to the extent possible.

**2(x)** A greenbelt of adequate density and width must be created all around the proposed power station and ash pond

CPCB. Three online continuous monitoring stations have been installed in the Power Plant with online systems in all the stacks of the 467.5 MW plant.

Apart from the above, monitoring of ambient air at 7 different locations and emission from all the stacks are being carried out by NABL accredited laboratories every month. The values for ambient air monitoring are enclosed.

Necessary Firefighting arrangements have been provided in Coal handling area, Coal yard and Oil storage and handling area.

Complied at our Smelter Plant

The disposal of Fly ash is being complied as per the conditions. There is no discharge of effluents to outside from Ash disposal area.

Ash, after being supplied to various avenues of utilization, is disposed dry in the ash disposal area i.e Ash mound.

About 359008 MT of ash (from all the units) was utilized in different applications (Cement manufacturing, Bricks manufacturing, road making and low-lying area filling) during the period April'20 to September'20 with utilization 79.5% of generated ash. The detailed ash utilization is enclosed.

To ensure 100% ash utilization, a detailed ash utilization program are in place.

Afforestation and plantation is being taken on the Ash transport road, in and around Plant and ash mound area etc. About 6.86 lakh trees have been planted since 1993-94. About 445 saplings have been planted during the period April'20 to



September'20.The details of plantation is enclosed.

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| 3 | Adequate Financial provisions must be provided in project cost and annual budgets for implementation of the conditions as stipulated above.  | Provisions have been made to allocate the funds for controlling the Pollution Control Equipment and abating the Pollution every year. The actual environmental expenditure for the period April'20 to September'20 is enclosed. |
| 4 | The above conditions may be modified or the additional ones may be imposed, if required from environmental angle.  | Agreed  |
| 5 | Enforcement of the stipulated conditions will among others be under the provisions of Water (Prevention and Control of Pollution) Act, 1974, the Air (Prevention and Control of Pollution) act, 1981 and the Environment (Protection) Act, 1986. | Agreed  |





## COMPLIANCE TO ENVIRONMENT CLEARANCE (EC) CONDITIONS

Name of the Project : 77 MW THERMAL POWER PROJECT AT HIRAKUD

Clearance No. & Date : J-13011/1/99-IA.II (T), dated 04<sup>th</sup> August, 1999

Compliance Period : April 2020 - September 2020

Sl. No.	Conditions	Compliance Status as on 30 <sup>th</sup> September 2020
2. (i)	All the conditions stipulated by Orissa Pollution Control Board vide their letter no. 10039/Ind-II-NOC-906 dated 27th May, 2003 should be strictly implemented.	All the condition stipulated by OSPCB are strictly implemented.
2. (ii)	One stack of height 100 mts with three flues and continuous monitoring facility should be installed. Exist velocity should be maintained around 20mts/sec as the predictions have been based on the same.	A single Stack of height 130 mtr. Height has been provided to the unit Forbes Marshall-Codel make Opacity Monitor (Model No: DCEM-2100) and Continuous Flue gas Analyser of SO <sub>2</sub> , NO <sub>x</sub> and CO <sub>2</sub> (Model No: GCEM 4000) have been installed in the Stack.
2. (iii)	Electrostatic precipitators having efficiency of not less than 99.8% should be installed and it should be ensured that the particulate emission would not exceed the prescribed limit of 150 mg/Nm <sup>3</sup> .	High Frequency Rectifier Transformers (HFTRs) have been provided in the ESPs to keep the particulate matter (PM) emissions from the stack below 50 mg/ NM <sup>3</sup> , as stipulated by MoEF&CC/CPCB/OSPCB. The unit was under shut down for the period April'20 to September'20.
2. (iv)	Closed Circuit Cooling Device with induced draft should be provided and it should be ensured that only minimum water is drawn for makeup purposes from Hirakud reservoir as permitted by the State Irrigation Department.	Closed circuit cooling tower with induced draft is provided which operates with more than 5.0 Cycle of Concentration (COC) in order to ensure the use of minimum fresh water for make-up purposes.
2. (v)	Noise level should he limited to 85 dBA and regular maintenance of equipment be undertaken for people working in the area of generator halls and other high noise areas, ear plug should be provided.	Noise abatement measures such as glass shields have been provided to Operator cabins and workstations. People working in the high noise area are provided with ear- muffs and PPE.  Noise quality is being monitored at various places in and around the plant regularly and data for April'20 to September'20 is enclosed.



- 2. (vi)** For controlling fugitive dust, regular sprinkling of water in coal handling and other vulnerable areas of the plant should be ensured
- For control of fugitive dust regular sprinkling is carried out in coal yard, roads around coal yard, Ash silo area, ash transportation road etc. through fixed sprinklers and mobile water sprinklers. Ash conditioners have been provided to each ash silo for moisturization of ash unloaded to trucks.
- 2. (vii)** Afforestation should be undertaken covering an area of about 10 acres for Unit-II and intensification of the existing green belt should be ensured. As committed, the Company should aim to plant 30,000-40,000 saplings every year. Vulnerable area such as coal handling plant, ash dump areas should be given preference for plantation work
- Afforestation and plantation is being taken on the Ash transport road, in and around Plant and ash Mound area etc. About 6.87 lakh trees have been planted since 1993-94. About 445 saplings have been planted during the year 2020-21. The details of plantation is enclosed.
- 2. (viii)** Coal should be used @ 57.59 tonnes/h with GCV of around 3610 KCal/kg and Sulphur content not exceeding 0.49%. The fuel should be transported only in covered tippers/trucks from Ib Valley Coalfields.
- Coal is being used with GCV of about 3187 Kcal/Kg. The coal is sourced from captive coal mine at Garepalma in the state of Chhatisgarh and coal mines in the state of Odisha and is transported to the plant through railways and Volvo-trucks covered with tarpaulin. The Sulphur content of Coal for the period April'20 to September'20 is enclosed.
- Result of Sulphur content in coal is awaited from NABL accredited lab.
- 2. (ix)** Since movement of about 100-120 Tippers/trucks will be involved for Unit-II in addition to the existing movement of similar number of trips for Unit-I, a proper traffic scheduling should be evolved and each vehicle should be checked for adequacy of cover before dispatch. The possibility of rail transport by extending the existing rail line from the present rail at Lapanga head to the mine site and from Sambalpur to the plant should also be examined.
- For transportation of coal from captive coal mine and various sources inside Odisha a Railway Siding (platform for unloading from wagons and loading into trucks destined to nearby coal yard) has been provided in the premise of Power Plant. Coal is also transported to the plant by tarpaulin covered trucks.
- 2. (x)** As per the proposal submitted for Ash Utilization, it should be ensured that fly ash is used in cement industry, Brick making and in raising the ash dyke etc.
- Ash, after being supplied to various avenues of utilization, is disposed dry in the ash disposal area i.e. Ash mound.



Efforts should also be made in the area of mine filling, land development and agriculture etc. Acquisition of additional land to the tune of 50 acres for ash disposal should be avoided as far as possible by ensuring 100% utilization.

About 359008 MT of ash (from all the units) was utilized in different applications (Cement manufacturing, Bricks manufacturing, road making and low-lying area filling) during the period April'20 to September'20 with utilization 79.5% of generated ash. The detailed ash utilization is enclosed.

To ensure 100% ash utilization, a detailed ash utilization program are in place.

**2. (xi)** All effluents generated in various plant activities should be collected in the Central Effluent Treatment plant and treated effluents to the tune of 160m<sup>3</sup>/Hr from CPP Unit-1 and Unit II only should be discharged after ensuring adherence to specified standards before its release in Kharjore nallah tributary of Mahanadi river. The concept of zero discharge should be adopted to a maximum possible extent.

Cooling Tower blow downs of the plant is treated in a RO based ETP of capacity 120 m<sup>3</sup>/hr. Other effluents are collected in a Common Monitoring Basin and treated in the RO and is reused in the Cooling Towers, in-house activities such as coal-yard spraying, road cleaning, water spraying at ash disposal area and gardening etc.

**2. (xii)** The project authorities should interact with the concerned State Government Departments for facilitating implementation of the "Project Turtle" of the State Government. The proposal drawn in this regard including the proposed financial support by the Company should be submitted to the Ministry within three months.

Interactions have already been made with the Chief Conservator of Forests-Wild Life and the principle Secretary, Forests and Environment Department, Government of Orissa for facilitating implementation for the "Project Turtle" of the State Government by providing financial support. We are yet to receive the communication on the above issues.

Further, we had applied to MoEF&CC, New Delhi with a copy to your office with a request for modification/ updation/withdrawal of this conditions from our EC.

**2. (xiii)** Regular monitoring for SPM, SO<sub>2</sub> and NO<sub>x</sub> around the power plant may be carried out and records maintained.

The ambient air quality is being monitored at seven locations regularly and data is submitted to Regional Office of MoEF&CC through half yearly EC compliance reports every year. The ambient air quality data monitored for the period April'20 to September'20 is enclosed.

**2. (xiv)** Full cooperation should be extended to the Scientists/Officers from the Regional Office of the Ministry at

Environmental Impact Assessment & Management Plan have already been submitted to Bhubaneswar Regional office.



Bhubaneswar/the CPCB/the SPCB who would be monitoring the compliance of environmental status. Complete set of impact assessment report and the Management Plans should be forwarded to the Regional Office for their use during monitoring.

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| <p><b>2. (xv)</b> Adequate financial provision should be made for implementation of environmental protection measures indicating item-wise break-up and at least 1% of the cost of the project should be spent on improvement of ecology of the area. These costs should be included as a part of project cost. The funds earmarked for environmental protection measures should not be diverted for other purposes and year-wise expenditure should be reported to the Ministry.</p> | <p>Provisions have been made to allocate the funds for controlling the Pollution Control Equipment and abating the Pollution every year. The actual environmental expenditure for the period April'20 to September'20 is enclosed.</p> |
| <p><b>2. (xvi)</b> The Company, should strengthen its Environmental Group to ensure continuous study of various environmental issues in the region.</p>   | <p>Various studies on environmental issues in the region are being undertaken from time to time.</p>   |
| <p><b>3.</b> The Ministry of Environment &amp; Forests or any other Competent Authority may modify / alter any of the stipulated condition(s) or stipulate any additional condition(s) in the interest of environment, which shall be complied with by the proponent. The Ministry reserves the right to revoke the clearance if conditions stipulated are not implemented to the satisfaction of the Ministry.</p>   | <p>Agreed</p>  |
| <p><b>4.</b> The environmental clearance accorded shall be valid for a period of 5 years for commencement of construction / operation of the power plant. In case the project authorities fail to do so within this stipulated period, this environmental</p>   | <p>Agreed</p>  |



clearance shall stand lapsed automatically.

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| <p><b>5.</b> In case of any deviation or alternation in the project profile / scope of the project a fresh reference should be made to the Ministry to assess the adequacy of the condition(s) imposed and to add additional environmental protection measures required, if any.</p>   | <p>In case of any alternation/deviation approval from the Ministry will be taken.</p> |
| <p><b>6.</b> The above stipulations would be enforced among others under the Water (Prevention and Control of Pollution) Act, 1974, the Air (Prevention and Control of Pollution) Act, 1981, the Environment (Protection) Act, 1986, Hazardous Wastes (Management &amp; Handling) Rules, 1989 and its amendments, the Public Liability Insurance Act, 1991 and its amendments, the Environment Impact Assessment Notification of January, 1994 and its amendments.</p> | <p>Agreed</p>   |



**Name of the Project** : **AUGMENTATION OF CPP AT HIRAKUD FROM 77 MW TO 100 MW (UNIT - II)**  
**Clearance No. & Date** : **J-13011/1/99-IA.II (T), dated 25<sup>th</sup> April, 2005**  
**Compliance Period** : **April 2020 - September 2020**

Sl No	Conditions	Compliance Status as on 30 <sup>th</sup> September 2020
2. (i)	All the conditions stipulated by Orissa Pollution Control Board vide their letter no. 10039/Ind-II-NOC-906 dated 27th May, 2003 should be strictly implemented.	All the condition stipulated by OSPCB are strictly implemented.
2(ii)	A stack of height of not less than 130 meters shall be provided with continuous online monitoring equipment.	A single stack of height 130 meters has been provided to the unit. Forbes Marshall-Codel make Opacity Monitor (Model No: DCEM-2100) and Continuous Flue gas Analyser of SO <sub>2</sub> , NO <sub>x</sub> and CO <sub>2</sub> (Model No: GCEM 4000) have been installed in the Stack.
2. (iii)	Electrostatic precipitators having efficiency of not less than 99.9% should be installed and it should be ensured that the particulate emission do not exceed the prescribed limit of 150 mg/Nm <sup>3</sup> .	High Frequency Rectifier Transformers (HFTRs) have been provided to the ESPs to keep the particulate matter (PM) emissions from the stack below 50 mg/ NM <sup>3</sup> , as stipulated by MoEF&CC/CPCB/OSPCB. The average PM value for the period April'20 to September'20 was 40.66 mg/NM <sup>3</sup> , which is far below the limit of 50 mg/NM <sup>3</sup> . The values are enclosed.
3	The Ministry of Environment & Forests or any other Competent Authority may modify / alter any of the stipulated condition(s) or stipulate any additional condition(s) in the interest of environment, which shall be complied with by the proponent. The Ministry reserves the right to revoke the clearance if conditions stipulated are not implemented to the satisfaction of the Ministry.	Agreed
4.	The environmental clearance accorded shall be valid for a period of 5 years for commencement of construction / operation of the power plant. In case the project	Agreed



authorities fail to do so within this stipulated period, this environmental clearance shall stand lapsed automatically.

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| <b>5</b> | In case of any deviation or alternation in the project profile / scope of the project a fresh reference should be made to the Ministry to assess the adequacy of the condition(s) imposed and to add additional environmental protection measures required, if any.   | In case of any alternation/deviation approval from the Ministry will be taken. |
| <b>6</b> | The above stipulations would be enforced among others under the Water (Prevention and Control of Pollution) Act, 1974, the Air (Prevention and Control of Pollution) Act, 1981, the Environment (Protection) Act, 1986, Hazardous Wastes (Management & Handling) Rules, 1989 and its amendments, the Public Liability Insurance Act, 1991 and its amendments, the Environment Impact Assessment Notification of January, 1994 and its amendments. | Agreed   |



## COMPLIANCE TO ENVIRONMENT CLEARANCE (EC) CONDITIONS

**Name of the Project :** 100 MW CPP (UNIT-III) EXPANSION AT HIRAKUD

**Clearance No. & Date :** J-13012/ 10/2004 - IA.II (T), dated 21<sup>st</sup> September 2005

**Compliance Period :** April 2020 - September 2020

Sl No	Condition	Compliance Status as on 30th September 2020
<b>3. (i)</b>	The conditions stipulated by Orissa Pollution Control Board vide their letters No. 33856/Ind-I-CON-3038 dated 03.12.2004 and no. 19425/IND-I-CON-3038 dated 29.6.2005 shall be strictly implemented.	All the conditions stipulated by OSPCB are being strictly implemented
<b>3. (ii)</b>	Ash content in coal should not exceed 40% and the Sulphur Content should not exceed 0.50 %	Report awaited from NABL accredited lab. Will be furnished later.
<b>3. (iii)</b>	Two Stacks of 130 mtr height with continuous on-line monitoring equipment and exit velocity of 30 m/s to be maintained. CFBC Boiler to be installed with in-built SO <sub>2</sub> reduction measures and low NO <sub>x</sub> burners shall be installed	One Stack of 130 m height, connected to three nos. of CFBC Boilers has been provided. Continuous online monitoring system has been installed in the stack. Designed exit velocity is less than 30 m/s. All the three nos. of CFBC Boilers have been provided with in-built SO <sub>2</sub> reduction measures and low NO <sub>x</sub> devices.
<b>3. (iv)</b>	High efficiency Electrostatic Precipitators (ESPs) having efficiency of not less than 99.9% shall be installed to ensure that SPM emissions do not exceed 100 mg/NM <sup>3</sup> . Bag filters shall be installed in the coal handling area.	High Frequency Rectifier Transformers (HFTRs) have been provided in the ESPs to keep the particulate matter (PM) emissions from the stack below 50 mg/ NM <sup>3</sup> , as stipulated by MoEF&CC/CPCB/OSPCB. The average PM value for the period April'20 to September'20 was 42.33 mg/NM <sup>3</sup> , which is far below the limit of 50 mg/NM <sup>3</sup> .





Further, bag filters have been provided in the Coal handling Plant, Ash Silos, etc for suppression of fugitive dust.

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| <b>3 (v)</b>    | Ash utilization should be carried out as per provisions of the notification on Fly Ash utilization issued by the Ministry in September, 1999 and its amendment. Borough earth shall not be taken from ash pond area for construction of ash dyke etc.                | Ash, after being supplied to various avenues of utilization, is disposed dry in the ash disposal area i.e. Ash mound.<br><br>About 359008 MT of ash (from all the units) was utilized in different applications (Cement manufacturing, Bricks manufacturing, road making and low-lying area filling) during the period April'20 to September'20 with utilization 79.5% of generated ash. The detailed ash utilization is enclosed.   |
| <b>3. (vi)</b>  | Closed Circuit Cooling Towers with induced draft shall be provided and it shall be ensured that only minimum water is drawn for makeup purposes from Hirakud reservoir. The effluent to be discharged into Kharjour nala should meet the prescribed discharge norms. | Closed circuit induced draft cooling tower has been provided and is being operated at minimum 5.0 Cycle of Concentration (COC) in order to ensure minimum use of fresh water for make-up purposes. No effluent is discharged to Khojur nallah in dry season, as directed by OSPCB through its CTO  |
| <b>3. (vii)</b> | Rain water harvesting shall be adopted in consultation with Central Groundwater Authority/ Board. The plan for the same shall be submitted within 3 months.  | Studies by the Dept. of Civil Engineering, A.U College of Engineering, Andhra University, Visakhapatnam in 2007 and M/S Visiontek Services Pvt. Ltd, Bhubaneswar in 2012, recommend not to adopt rain water harvesting in Hirakud area for: <ol style="list-style-type: none"> <li>1. Presence of shallow water table.</li> <li>2. Hard rock at shallow depth</li> <li>3. Water logging in the area and</li> <li>4. Rising trend of the water table in the area</li> </ol> <p>We are exploring the feasibility study of rain water harvesting in nearby area.</p> <p>A fresh study on rain water harvesting is being carried out to explore the feasibility.</p> |
| <b>3 (viii)</b> | Regular monitoring of water quality including heavy metals should be   | Regular monitoring of water quality including heavy metals of leachate of ash disposal area is   |



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|                 | undertaken around ash dyke and the project area to ascertain the change in the water quality due to leaching of contaminants, if any, from ash disposal area.  | being carried out and the water quality meets the prescribed standard.   |
| <b>3 (ix)</b>   | Noise level should not exceed 75 dBA (Leq). People working in the high noise area, should be provided with ear protective devices.   | Noise abatement measures such as glass shields have been provided to Operator cabins and workstations. People working in the high noise area are provided with ear- muffs and PPE. Noise quality is being monitored at various places in and around the plant regularly and data for April'20 to September'20 is enclosed. |
| <b>3 (x)</b>    | Greenbelt along the plant boundary and plantation in vacant space in and around Hirakud complex shall be developed. A plan in this regard shall be prepared and submitted within 3 months.   | Afforestation and plantation is being taken on the Ash transport road, in and around Plant and ash Mound area etc. About 6.87 lakh trees have been planted since 1993-94. About 445 saplings have been planted during the year 2020-21. The details of plantation is enclosed.   |
| <b>3 (xi)</b>   | Regular monitoring of the air quality shall be carried out in and around the power plant and records shall be maintained. Six monthly reports shall be submitted to this Ministry and its Regional Office at Bhubaneswar.  | The ambient air quality is being monitored at seven locations regularly and data is submitted to Regional Office of MoEF&CC through half yearly EC compliance reports every year. The ambient air quality data monitored for the period April'20 to September'20 is enclosed.  |
| <b>3 (xii)</b>  | For controlling fugitive dust, regular sprinkling of water in vulnerable areas of the plant shall be ensured.  | For control of fugitive dust regular sprinkling is carried out in coal yard, roads around coal yard, Ash silo area, ash transportation road etc. through fixed sprinklers and mobile water sprinklers. Ash conditioners have been provided to each ash silo for moisturization of ash unloaded to trucks.                  |
| <b>3 (xiii)</b> | The project proponent shall advertise in at least two local newspapers widely circulated in the region around the project, one of which should be in the vernacular language of the locality concerned, informing that the project has been accorded environmental clearance and copies of clearance letters are available with the State Pollution Control Board/ Committee and may also be seen at | Complied   |



Website, of the Ministry of Environment and Forests at <http://envfor.nic.in>.

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| <b>3 (xiv)</b>   | A separate environment monitoring cell with qualified staff shall be set up for implementation of the stipulated environmental safeguards.   | A separate Environmental Management Cell with adequate laboratory facility has been set up at Hirakud Complex, to carry out environmental management and monitoring functions.  |
| <b>3(xv)</b>     | Separate funds shall be allocated for implementation of environmental protection measures along with item-wise break-up. These cost shall be included as part of the project cost. The funds earmarked for the environment protection measures shall not be diverted for other purposes and year-wise expenditure shall be reported to the Ministry. | Provisions are being made to allocate the funds for controlling the Pollution Control Equipment and abating the Pollution every year. The actual environmental expenditure for the period April'20 to September'20 is enclosed. |
| <b>3. (xvi)</b>  | Half yearly report on the status of implementation of the stipulated conditions and environmental safeguards shall be submitted to this Ministry/ Regional Office/CPCB/SPCB.   | Being Complied  |
| <b>3 (xvii)</b>  | Regional Office of the Ministry of Environment & Forests located at Bhubaneswar will monitor the implementation of the stipulated conditions. Complete set of Environmental Impact Assessment Report and Management Plan should be forwarded to the Regional Office for their use during monitoring.   | Environmental Impact Assessment & Management Plan have already been submitted to Bhubaneswar Regional office.   |
| <b>3 (xviii)</b> | Full cooperation shall be extended to the Scientists/Officers from the Ministry/Regional Office of the Ministry at Bhubaneswar/CPCB/SPCB during monitoring of the compliance of environmental status.  | Being complied  |
| <b>4</b>         | The Ministry reserves the right to revoke the clearance if stipulated conditions are not implemented to the satisfaction of the Ministry. The stipulated conditions could be modified / altered or new conditions stipulated by the Ministry or any other  | Agreed  |



Competent Authority in the interest of environment protection and the same shall be implemented by the project proponent.

- 5 The environmental clearance accorded shall be valid for a period of 5 years for starting construction / operation of the power plant. In case the project authorities fail to do so within this stipulated period, this environmental clearance shall stand lapsed automatically. This is an operating unit.
- 6 In case of any deviation or alternation in the project profile from those submitted to this Ministry for clearance, a fresh reference should be made to the Ministry to assess the adequacy of the condition(s) imposed and to add additional environmental protection measures required, if any. Agreed



**ANNEXURE - II**

**ENVIRONMENTAL QUALITY PARAMETERS OF SMELTER**  
**(April-2020 TO September-2020)**

**STACK EMISSION FUME TREATMENT PLANT (DRY SCRUBBERS)**

**Particulate Matter: Standard: 100 mg/Nm<sup>3</sup> Total Fluoride: Standard: 0.3 Kg/MT. Al.**

Location of sampling	Unit	Apr'20	May'20	June'20	July'20	Aug'20	Sep'20
<b>FTP I - Stack I</b>							
Particulate Matter	mg/Nm <sup>3</sup>	7.55	12.31	6.29	9.23	8.46	8.84
Total Fluoride	Kg/t. Al.	0.12	0.16	0.12	0.13	0.10	0.09
<b>FTP - I - Stack II</b>							
Particulate Matter	mg/Nm <sup>3</sup>	11.77	12.08	8.23	10.32	9.65	9.54
Total Fluoride	Kg/t. Al.	0.14	0.13	0.11	0.12	0.14	0.11
<b>FTP - II - Stack - III</b>							
Particulate Matter	mg/Nm <sup>3</sup>	12.45	10.93	8.28	9.42	9.43	5.82
Total Fluoride	Kg/t. Al.	0.13	0.10	0.10	0.09	0.14	0.16
<b>FTP - III- Stack - IV</b>							
Particulate Matter	mg/Nm <sup>3</sup>	6.01	7.11	8.06	8.45	8.00	7.63
Total Fluoride	Kg/t. Al.	0.11	0.09	0.08	0.10	0.13	0.09
<b>FTP - IV- Stack - V</b>							
Particulate Matter	mg/Nm <sup>3</sup>	8.65	9.24	9.43	10.10	8.04	8.04
Total Fluoride	Kg/t. Al.	0.10	0.11	0.09	0.11	0.12	0.13

**STACK EMISSION (Cast House & Caster) (by NABL approved External Lab)**

**Particulate Matter: Unit: mg/Nm<sup>3</sup>**

**Standard: 100 mg/Nm<sup>3</sup>**

Sampling Location	PM mg/Nm <sup>3</sup>
<b>CAST HOUSE - I :</b>	
Stack-6 (Furnace -A)	39.0
Stack-7 (Furnace -B)	44.0
<b>CAST HOUSE - II, III, IV &amp; Caster (Stack No.9, 10, 11 &amp;12)</b>	
Stack - 9 (Furnace-1&2)	52.0
Stack -10 (Furnace-A&B)	29.0
Stack -11 (Furnace-A&B)	34.6
Stack -12 (Furnace-A&B)	17.0

\*Stack-8 (Furnace -C) Shut Down.



**FUGITIVE EMISSION**

**Total Fluoride: Unit: Kg/MT. Al.**

**Standard: 0.4 kg/MT.Al.**

Location of sampling	Apr'20	May'20	June'20	July'20	Aug'20	Sep'20
PR-I, 28 Pot	Shut down	Shut down	Shut down	Shut down	Shut down	Shut down
PR-II, Section IV	0.30	0.29	0.31	0.30	0.32	0.28
PR-III, Section V	0.32	0.31	0.30	0.28	0.31	0.29
PR-IV, Section VIII	0.33	0.30	0.32	0.31	0.33	0.32
PR-V, Section IX&X	Shut down	Shut down	Shut down	Shut down	Shut down	Shut down
PR-VI,RS End	Shut down	Shut down	Shut down	Shut down	Shut down	Shut down
PR-VII,RS End	0.31	0.33	0.33	0.30	0.29	0.31
PR -VIII,RS End	0.32	0.31	0.32	0.33	0.32	0.30
PR- IX ,RS End	0.33	0.34	0.34	0.32	0.34	0.33
PR -X , RS End	0.34	0.35	0.35	0.34	0.35	0.34
PR -XI, RS End	Shut down	Shut down	Shut down	Shut down	Shut down	Shut down
80-POT Area (Middle)	0.30	0.31	0.30	0.29	0.27	0.30

**AMBIENT AIR QUALITY (Monthly Average Online AAQMS Data)**

Month-Year	Station Id	CO	NO	NO2	NOX	PM10	PM2.5	SO2
		Limit:- 2000 µg/Nm3	Limit :- 80 µg/Nm3	Limit :- 80 µg/Nm3	Limit :- 80 µg/Nm3	Limit :- 100 µg/Nm3	Limit :- 60 µg/Nm3	Limit :- 80 µg/Nm3
Apr-2020	AAQMS-1	0.179	2.456	3.445	5.911	9.921	30.556	4.364
Apr-2020	AAQMS-2	1.552	0.314	0.338	0.425	16.182	9.112	0.714
May-2020	AAQMS-1	0.076	2.53	1.051	3.558	7.08	27.196	8.362
May-2020	AAQMS-2	1.525	0.294	0.31	0.397	9.798	7.472	0.728
Jun-2020	AAQMS-1	0.051	2.537	1.039	3.553	5.812	21.266	9.586
Jun-2020	AAQMS-2	1.44	0.322	0.35	0.445	13.53	9.135	0.735
Jul-2020	AAQMS-1	0.027	2.537	1.035	3.552	3.8	13.673	5.087
Jul-2020	AAQMS-2	1.402	0.324	0.341	0.449	16.135	20.765	0.715
Aug-2020	AAQMS-1	0.039	2.541	1.054	3.567	3.825	15.404	4.763
Aug-2020	AAQMS-2	1.491	0.323	0.344	0.449	20.801	8.224	0.713
Sep-2020	AAQMS-1	0.039	2.539	1.037	3.554	7.037	21.673	6.101
Sep-2020	AAQMS-2	1.344	0.331	0.351	0.478		24.967	0.709

- Location:-AAQMS-1:- Near Administrative Building & AAQMS-2:- 80 Pot area near 50 KLD ETP



**GROUND WATER ANALYSIS : Parameter: F- Unit: mg/l**

Location of sampling (SPL shed Area)	Apr'20	May'20	June'20	July'20	Aug'20	Sep'20
Sludge pit test well (E)	0.54	0.52	0.57	0.57	0.58	0.60
Sludge pit test well(W)	0.65	0.63	0.69	0.69	0.70	0.68
Sludge pit test well (N)	0.37	0.35	0.36	0.36	0.32	0.34
Sludge pit test well (S)	0.43	0.44	0.41	0.41	0.43	0.45
Tube well near sludge pit	0.29	0.29	0.30	0.30	0.30	0.29

**WATER ANALYSIS:**

(a) The treated water quality after treatment in the Effluent Treatment Plant (ETP outlet) was monitored. The values were as follows: (by NABL approved External Lab)

(i) **ETP (R&D back side) 250 KLD**

SL. NO.	Parameter	Unit	Limit	Value Outlet of ETP
1	pH	-	6.5-9.0	6.31
2	TSS	mg/L	100	<1
3	TDS	mg/L	2100	17.0
4	Fluoride	mg/L	2.0	0.49
5	OIL & GREASE	mg/L	10.0	<1.0
6	BOD	mg/L	30	<3
7	COD	mg/L	250	<5
8	Chromium hexavalent	mg/L	0.1	<0.05
9	Cyanide	mg/L	0.2	<0.02
10	Free ammonia	mg/L	5.0	<0.1
11	Total Nitrogen	mg/L	100	<1.0
12	Total Chromium	mg/L	2.0	<0.01



(ii) **ETP (CPP side) 250 KLD**

SL. NO.	Parameter	Unit	Limit	Value Outlet of ETP
1	pH	-	6.5-9.0	6.29
2	TSS	mg/L	100	2.3
3	TDS	mg/L	2100	92.0
4	Fluoride	mg/L	2.0	0.35
5	OIL & GREASE	mg/L	10.0	<1.0
6	BOD	mg/L	30	<3
7	COD	mg/L	250	10.0
8	Chromium hexavalent	mg/L	0.1	<0.05
9	Cyanide	mg/L	0.2	<0.02
10	Free ammonia	mg/L	5.0	<0.1
11	Total Nitrogen	mg/L	100	<1.0
12	Total Chromium	mg/L	2.0	<0.01

(iii) **ETP (80 Pot Area) 50 KLD**

SL. NO.	Parameter	Unit	Limit	Value Outlet of ETP
1	pH	-	6.5-9.0	6.79
2	TSS	mg/L	100	1.0
3	TDS	mg/L	2100	30.0
4	Fluoride	mg/L	2.0	0.23
5	OIL & GREASE	mg/L	10.0	<1.0
6	BOD	mg/L	30	<3
7	COD	mg/L	250	<5
8	Chromium hexavalent	mg/L	0.1	<0.05
9	Cyanide	mg/L	0.2	<0.02
10	Free ammonia	mg/L	5.0	<0.1
11	Total Nitrogen	mg/L	100	<1.0
12	Total Chromium	mg/L	2.0	<0.01





(b) Domestic effluent after treatment in Sewage Treatment Plant (STP Outlet) was monitored.

The values were as follows: (by NABL approved External Lab)

(i) **Plant STP (CPP side) 500 KLD**

SL. NO.	Parameter	Unit	Limit	Value Domestic Effluent
1	pH	-	6.5-9.0	6.0
2	TSS	mg/L	100.0	1.6
3	BOD	mg/L	30	<3
4	Fecal Coliform(FC)	Mpn / 100 ml	1000 (max)	<1.8

(ii) **Plant STP(CPP side) 300 KLD**

SL. NO.	Parameter	Unit	Limit	Value Domestic Effluent
1	pH	-	6.5-9.0	6.24
2	TSS	mg/L	100.0	3.7
3	BOD	mg/L	30	<3
4	Fecal Coliform(FC)	Mpn / 100 ml	1000 (max)	<1.8

(iii) **Plant STP(80 Pot area) 100 KLD**

SL. NO.	Parameter	Unit	Limit	Value Domestic Effluent
1	pH	-	6.5-9.0	7.14
2	TSS	mg/L	100.0	1.2
3	BOD	mg/L	30	<3
4	Fecal Coliform(FC)	Mpn / 100 ml	1000 (max)	<1.8

(iv) **Colony STP(Main Colony) 400 KLD**

SL. NO.	Parameter	Unit	Limit	Value Domestic Effluent
1	pH	-	6.5-9.0	6.44
2	TSS	mg/L	100.0	1.7
3	BOD	mg/L	30	<3
4	Fecal Coliform(FC)	Mpn / 100 ml	1000 (max)	<1.8



**ANNEXURE - III**

**ENVIRONMENTAL QUALITY PARAMETERS OF CPP**  
**(April-2020 TO September-2020)**

**STACK EMISSION**  
**(April 20 to Sep' 2020)**

**Unit # I**

Process attached to the unit : Boiler # 1 & 2

Sl. No.	Month / Year	Unit	PM	SO <sub>2</sub>	NO <sub>x</sub>	Hg
01.	Apr'20r	mg / NM <sup>3</sup>	The unit was under shut down (SD)			
02.	May'20	mg / NM <sup>3</sup>	The unit was under shut down (SD)			
03.	June'20	mg / NM <sup>3</sup>	The unit was under shut down (SD)			
04.	July'20	mg / NM <sup>3</sup>	The unit was under shut down (SD)			
05.	Aug'20	mg / NM <sup>3</sup>	The unit was under shut down (SD)			
06.	Sep'20	mg / NM <sup>3</sup>	The unit was under shut down (SD)			
	<b>Average</b>	mg / NM <sup>3</sup>	The unit was under shut down (SD)			
	<b>Standard</b>	mg / NM <sup>3</sup>	100	600	600	0.03



**STACK EMISSION**  
**(April 20 to Sep' 2020)**

**Unit # II**

Process attached to the unit : Boiler # 3, 4 & 5

<b>Sl.No.</b>	<b>Month / Year</b>	<b>Unit</b>	<b>PM</b>	<b>SO<sub>2</sub></b>	<b>NO<sub>x</sub></b>	<b>Hg</b>
01.	Apr'20r	mg / NM <sup>3</sup>	39.12	385.63	159.77	0.0056
02.	May'20	mg / NM <sup>3</sup>	38.60	383.48	165.48	0.0054
03.	June'20	mg / NM <sup>3</sup>	40.93	387.23	171.32	0.0059
04.	July'20	mg / NM <sup>3</sup>	41.90	390.28	172.75	0.0061
05.	Aug'20	mg / NM <sup>3</sup>	42.25	368.98	157.43	0.0052
06.	Sep'20	mg / NM <sup>3</sup>	41.18	386.00	170.52	0.0054
	<b>Average</b>	mg / NM <sup>3</sup>	40.66	383.60	166.21	0.0056
	<b>Standard</b>	mg / NM <sup>3</sup>	50	600	300	0.03



**STACK EMISSION**  
**(April 20 to Sep' 2020)**

**Unit # III**

Process attached to the unit : Boiler # 6, 7 & 8

Sl.No.	Month / Year	Unit	PM	SO <sub>2</sub>	NO <sub>x</sub>	Hg
01.	Apr'20r	mg / NM <sup>3</sup>	The unit was under shut down (SD)			
02.	May'20	mg / NM <sup>3</sup>	42.75	384.00	166.00	0.0052
03.	June'20	mg / NM <sup>3</sup>	43.50	406.00	176.95	0.0060
04.	July'20	mg / NM <sup>3</sup>	43.00	411.45	182.55	0.0059
05.	Aug'20	mg / NM <sup>3</sup>	The unit was under shut down (SD)			
06.	Sep'20	mg / NM <sup>3</sup>	40.08	397.00	172.55	0.0055
	<b>Average</b>	mg / NM <sup>3</sup>	42.33	399.61	174.51	0.0057
	<b>Standard</b>	mg / NM <sup>3</sup>	50	600	300	0.03



**STACK EMISSION**  
**(April 20 to Sep' 2020)**

**Unit # IV**

Process attached to the unit : Boiler # 9, 10 & 11

Sl.No.	Month / Year	Unit	PM	SO <sub>2</sub>	NO <sub>x</sub>	Hg
01.	Apr'20r	mg / NM <sup>3</sup>	41.27	398.22	165.17	0.0058
02.	May'20	mg / NM <sup>3</sup>	40.88	393.57	171.35	0.0057
03.	June'20	mg / NM <sup>3</sup>	41.08	393.97	176.95	0.0058
04.	July'20	mg / NM <sup>3</sup>	42.35	396.12	181.97	0.0058
05.	Aug'20	mg / NM <sup>3</sup>	39.90	395.62	179.95	0.0057
06.	Sep'20	mg / NM <sup>3</sup>	37.93	393.55	179.20	0.0057
	<b>Average</b>	mg / NM <sup>3</sup>	40.57	395.18	175.77	0.0058
	<b>Standard</b>	mg / NM <sup>3</sup>	50	600	300	0.03



**STACK EMISSION**  
**(April 20 to Sep' 2020)**

**Unit # V**

Process attached to the unit : Boiler # 12 & 13

<b>Sl.No.</b>	<b>Month / Year</b>	<b>Unit</b>	<b>PM</b>	<b>SO<sub>2</sub></b>	<b>NO<sub>x</sub></b>	<b>Hg</b>
01.	Apr'20r	mg / NM <sup>3</sup>	40.88	369.18	158.43	0.0055
02.	May'20	mg / NM <sup>3</sup>	43.30	430.00	182.10	0.0063
03.	June'20	mg / NM <sup>3</sup>	40.60	390.75	166.85	0.0057
04.	July'20	mg / NM <sup>3</sup>	41.98	392.75	172.30	0.0057
05.	Aug'20	mg / NM <sup>3</sup>	38.85	406.00	182.83	0.0058
06.	Sep'20	mg / NM <sup>3</sup>	38.10	397.20	176.70	0.0059
	<b>Average</b>	mg / NM <sup>3</sup>	40.62	397.65	173.20	0.0058
	<b>Standard</b>	mg / NM <sup>3</sup>	50	600	300	0.03



## **FINAL EFFLUENT ANALYSIS**

**(April 20 to Sep' 2020)**

### **INDUSTRIAL EFFLUENT (CPP):**

Sl. No	PARAMETERS	Apr' 20	May' 20	June' 20	July' 20	Aug' 20	Sep' 20
1	Color & Odour	Colorless & Odorless	Colorless & Odorless	Colorless & Odorless	Colorless & Odorless	Colorless & Odorless	Colorless & Odorless
2	pH at 25°C	6.85	7.24	6.93	7.04	6.87	7.36
3	Turbidity	2.7	3.0	3.5	2.9	3.2	3.4
4	Total Suspended Solids (as TSS)	32.0	35.0	41.0	46.0	40.0	31.0
5	Total Dissolved Solids (as TDS)	561.0	577.0	586.0	567.0	534.0	518.0
6	Oil & Grease (as O & G)	3.2	2.6	3.4	2.8	3.0	2.6
7	Total Residual Chloride	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
8	Ammonical Nitrogen (as NH <sub>3</sub> -N)	1.44	1.28	1.52	1.72	1.56	1.2
9	Total Kjeldahl Nitrogen (as N)	2.26	2.4	2.74	3.12	2.82	2.28
10	Free Ammonia (as NH <sub>3</sub> )	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
11	Biochemical Oxygen Demand as BOD(3days at 27 <sup>o</sup> C)	6.0	6.4	7.2	8.0	7.4	6.8
12	Chemical Oxygen Demand (as COD)	24.0	28.0	32.0	36.0	30.0	24.0
13	Arsenic (as As)	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
14	Mercury (as Hg)	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
15	Lead (as Pb)	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
16	Cadmium (as Cd)	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003
17	Hexavalent Chromium (as Cr <sup>+6</sup> )	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
18	Total Chromium (as Cr)	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
19	Copper (as Cu)	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
20	Zinc (as Zn)	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
21	Selenium (as Se)	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
22	Nickel (as Ni)	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
23	Cyanide ( as CN)	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
24	Fluoride (as F)	0.21	0.27	0.32	0.35	0.38	0.51
25	Dissolved phosphate ( as P)	0.29	0.33	0.35	0.42	0.47	0.56
26	Sulphide (as S)	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
27	Phenolic Compound (as C <sub>6</sub> H <sub>5</sub> OH)	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
28	Manganese (as Mn)	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
29	Iron (as Fe)	0.17	0.19	0.22	0.26	0.23	0.28
30	Vanadium (as V)	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
31	Nitrate Nitrogen (as NO <sub>3</sub> -N)	0.76	0.68	0.73	0.67	0.73	1.2
32	Bio- assay Test	All fishes survive after 96 hrs in 100% effluent	All fishes survive after 96 hrs in 100% effluent	All fishes survive after 96 hrs in 100% effluent	All fishes survive after 96 hrs in 100% effluent	All fishes survive after 96 hrs in 100% effluent	All fishes survive after 96 hrs in 100% effluent



**AMBIENT AIR MONITORING, (CPP)  
(April 20 to Sep' 2020)**

**PARTICULATE MATTER 10 (PM<sub>10</sub>) :** **Limit : 100.00 µg / m<sup>3</sup>**

Location	Apr'20	May'20	June'20	July'20	Aug'20	Sep'20
FHP Control Room Top			71	62	66	71.0
120° NNE (Near Hindalco Admn. Building)			58	55	52	60.0
240° SSE (Rajapada village)			62	72	65	68.0
360° W (Hindalco Club)			53	50	54	57.0
Jyoti Vihar, Burla			55			
Ash Mound Road			71	75	81	92.0
Ash Mound area			63	62	60	74.0

- AAQ monitoring in core and buffer zone in April and May was not done due to COVID19.
- Monitoring at Jyoti Vihar was stopped due to Covid 19 from July 2020

**SULPHUR DI-OXIDE (SO<sub>2</sub>) :** **Limit : 80.00 µg / m<sup>3</sup>**

Location	Apr'20	May'20	June'20	July'20	Aug'20	Sep'20
FHP Control Room Top			16.6	15.7	16.1	18
120° NNE (Near Hindalco Admn. Building)			11.8	10.7	10.2	11.5
240° SSE (Rajapada village)			13.2	12.3	13.1	12.4
360° W (Hindalco Club)			12.6	11.8	11.3	11.8
Jyoti Vihar, Burla			11.4			
Ash Mound Road			14.8	15.3	16.5	17.7
Ash Mound area			16.5	14.8	13.7	15.1

- AAQ monitoring in core and buffer zone in April and May was not done due to COVID19.
- Monitoring at Jyoti Vihar was stopped due to Covid 19 from July 2020





**NITROGEN OXIDE (NO<sub>x</sub>)** : **Limit : 80.00 µg / m<sup>3</sup>**

Location	Apr'20	May'20	June'20	July'20	Aug'20	Sep'20
FHP Control Room Top			13.3	12.4	12.3	14.7
120° NNE (Near Hindalco Admn. Building)			14.7	13.8	14.4	15.6
240° SSE (Rajapada village)			16.3	15.7	16.6	17
360° W (Hindalco Club)			15.2	16.1	15.7	15.2
Jyotivihar, Burla			15.6			
Ash Mound Road			18.1	19.4	21.2	23.1
Ash Mound area			20.3	18.3	17.6	20.2

- AAQ monitoring in core and buffer zone in April and May was not done due to COVID19.
- Monitoring at Jyoti Vihar was stopped due to Covid 19 from July 2020

**PARTICULATE MATTER 2.5 (PM<sub>2.5</sub>)** : **Limit : 60.00 µg / m<sup>3</sup>**

Location	Apr'20	May'20	June'20	July'20	Aug'20	Sep'20
FHP Control Room Top			38.5	31.6	35.2	38.5
120° NNE (Near Hindalco Admn. Building)			30.7	29.6	27.8	31.2
240° SSE (Rajapada village)			33.5	38.3	34.3	35.4
360° W (Hindalco Club)			28.6	26.8	28.5	29.6
Jyoti Vihar, Burla			29.5			
Ash Mound Road			37.7	39.5	43	49.8
Ash Mound area			33.3	33.1	31.7	39.3

- AAQ monitoring in core and buffer zone in April and May was not done due to COVID19.
- Monitoring at Jyoti Vihar was stopped due to Covid 19 from July 2020



**STATUS OF UTILISATION OF FLY ASH AND BOTTOM ASH**  
**((April 20 to Sep' 2020))**

<b>Sl. No</b>	<b>Description</b>	<b>Quantity</b>
1	Quantity of fly ash generated (MT)	406112
2	Quantity of bottom ash generated (MT)	45123
	<b>Total ash generated (MT)</b>	451235
3	Supply to Brick Manufacturing Units (MT)	203921
4	Supply to Cement Plants (MT)	83641
5	Land Filling (MT)	26956
6	Utilization in Embankment / Dyke Raising (MT)	16007
7	Utilization in other purposes (MT) (road making etc)	28483
	<b>Total Ash Utilized (MT)</b>	359008
8	% of total ash utilization	79.5



## **PLANTATION DETAILS**

<b>YEAR</b>	<b>NO. OF SAPLINGS PLANTED</b>	<b>AREA COVERED (ACRE)</b>	<b>SPECIES PLANTED</b>
Up to 2006 – 07	419865	250.12	
2007 – 08	33,000	12.0	Chakunda, Gambhari, Sisam, Krushna Chuda, Radha Chuda, Jammun & Neam
2008 – 09	25,200	16.0	Chakunda, Gambhari, Sisam, Krushna Chuda, Radha Chuda, Jammun & Neam
2009 – 10	31,000	10.0	Chakunda, Gambhari, Sisam, Krushna Chuda, Radha Chuda, Jammun & Neam
2010 – 11	30,000	10.0	Chakunda, Gambhari, Sisam, Krushna Chuda, Radha Chuda, Jammun & Neam
2011 – 12	25,200	10.0	Chakunda, Gambhari, Sisam, Krushna Chuda, Radha Chuda, Jammun & Neam
2012 – 13	25000	10.0	Neam, Karanja, Sisam, Krushna Chuda, Radha Chuda, Cassia Fistula, Alstonia & Kadamba
2013 – 14	30000	13.0	Neem, Karanja, Sisam, Cassia Fistula, Alstonia, Kadamba, Mango, Jamunetc
2014 – 15	12000	6.0	Neem, Karanja, Sisam, Cassia Fistula, Alstonia, Kadamba, Mango, Jamunetc
2015 – 16	10000	5.0	Bamboo, Sisoo, Karanja, Alstonia, Chhatiana, Mango, Jamunetc
2016 – 17	21175	10.6	Bamboo, Ficus, Alstonia, Champa, Plumeria Alva etc
2017 – 18	13500	6.75	Krushnachuda, Radhachuda, Acassia, Ficus, Jamun, Arjun, Ashok etc
2018 - 19	10500	5.25	Bamboo, Sisam, Cassia Fistula, Alstonia, Kadamba, Mango, Jamun
2019 - 20	8400	4.2	Alstonia, Champa Bamboo, Sisam, Alstonia, Kadamba, Mango, Jamun
2020 – 21 (Upto Sep)	445	0.45	Ficus, Rubber, Mulsari, Ashok, Radhachuda, Krushnachuda, Jamun, Neem, Debdaroo etc
<b>Total</b>	<b>686885</b>	<b>369.37*</b>	

\* Including replenished area



**ENVIRONMENTAL EXPENDITURE**  
**(April 20 to Sep' 2020)**

01. Ash Disposal	:	Rs. 1070.36	Lakh
02. Operating & Maintenance cost of ESP, Ash Handling Plant including Ash Silo & CHP DES	:	Rs. 46.35	Lakh
03. Emt. Monitoring / Emt. Charges including Environment Management System and water cess	:	Rs. 16.84	Lakh
04. Plantation Activities	:	Rs. 16.87	Lakh
05. Aesthetics	:	Rs. 137.48	Lakh
06. Community Development (Hirakud complex)	:	<b>Rs. 55.94</b>	<b>Lakh</b>
		<hr/>	
<b>TOTAL</b>	<b>:</b>	<b>Rs. 1343.84</b>	<b>Lakh</b>



**AMBIENT NOISE QUALITY DATA (CPP)**  
**(April 20 to Sep' 2020)**

Sl. No.	Location	Category	Standard* Day / Night	Distance / Direction w.r.t Plant	Noise Level (Day/Night) in dB(A)					
					Apr'20	May'20	June'20	July'20	Aug'20	Sep'20
1.	Riverside Colony	Residential	55/45	0.8 km / SW	46.9/39.6	49.7/42.2	51.9/43.8	53.4/42.6	54.2/41.8	53.9/44.8
2.	Tarasingh pada	Residential	55/45	0.2 km / S	42.0/38.3	48.4/43.7	50.7/44.4	51.8/43.3	52.0/44.1	51.9/43.2
3.	Christianpada	Residential	55/45	0.1 km / S	43.1/40.5	49.0/45.0	50.7/41.8	52.2/42.8	52.2/40.7	54.1/43.6
4.	Power Plant Security Gate	Industrial	75/70	Plant Site	50.6/46.2	52.5/48.8	54.5/50.5	55.3/51.3	53.6/50.4	56.1/52.5
5.	Power Colony	Residential	55/45	0.4 km / NW	47.9/40.3	51.2/44.6	53.5/43.3	54.1/40.6	52.7/43.6	52.4/44.2

\* Day Time : 0600 to 2200 Hrs      \* Night Time : 2200 to 0600 Hrs.



**ANNEXURE – IV**

**CSR ACTIVITIES WITH EXPENSES**  
**April-2020 TO September-2020**

Area	Activities	No of Benf Covered in nos.	Amount Expenses in Lakh
Education	Mini Science Laboratory Development and follow up cum training activities.	1200	1.94
	ITI Training to a poor student	1	0.22
	<b>Total</b>	<b>1201</b>	<b>2.16</b>
Health care	COVID care Support to Dist Administration and Community	23000	40.19
	Support for Immunisation Programmes	1250	0.12
	Healthcare Awareness programmes	1375	0.50
	Free Homeopathic clinic for villagers	660	5.40
	Drinking Water Supply To Villages By water tanker	900	1.00
	Tube well installation	50	1.00
	<b>Total</b>	<b>27235</b>	<b>48.21</b>
Sustainable Livelihood	Tailoring Training Programme & SHG Development for undertaking Income generation Programme	50	3.52
	Support to farmers for Crop & Equipment's	20	1.75
	<b>Total</b>	<b>70</b>	<b>5.27</b>
Infrastructure development			
	<b>Total</b>	<b>0</b>	<b>0.00</b>
Social Empowerment	Social awareness Programmes	755	0.30
	<b>Total</b>	<b>755</b>	<b>0.30</b>
	<b>Grand Total</b>	<b>29261</b>	<b>55.94</b>