

Status of conditions imposed in Environmental Clearance for proposed enhancement of production capacity of Alumina Refinery (1.5 to 3.0 MTPA) along with Cogeneration Power Plant (90 to 150 MW), F. No. J-11011/753/2007-IA.II (I) dated 25.06.2018

Project Name : UTKAL ALUMINA INTERNATIONAL LTD.

Sl. No.	Imposed Condition	Compliance Status
1	The PP shall implement recommendations of the approved Site-Specific Conservation Plan & Wildlife Management Plan in consultation with the State Forest Department. The implementation report shall be furnished along with the six monthly compliance report.	As per the recommendation of the study on Site-Specific Conservation Plan & Wildlife Management Plan, sum of Rs. 1,17,57,852/- has been deposited in the CAMPA fund for the purpose of implementation of various activities within the project impact area by the Forest Department as envisaged in the plan. However, awareness has been created in the periphery of the project site as per the plan.
2	The red mud already generated from the existing plant shall be stored in the red mud pond lined with impervious clay prior to use to prevent leakage, designed as per the CPCB guidelines with proper leachate collection system. Ground water shall be monitored regularly all around the red mud disposal area and report submitted to the Regional Office of the Ministry. Proper care shall be taken to ensure no run off or seepage from the red mud disposal site to natural drainage. Plan shall be prepared and implemented for utilising the already generated red mud in a time bound manner.	Red mud pond has been constructed as per the design and drawing approved by State Pollution Control Board vide their Letter No. 19306/IND-IV-HW-931 dated 30.08.2012. The red mud pond is lined with clay & 1.5 mm HDPE liner with sub-soil drainage collection & reuse system, run-off drainage network and leachate collection facility. The red mud from red mud filtration unit is being stored in red mud pond. Ground water is being monitored around the red mud pond and the report is enclosed as Annexure-I . R&D scheme has been developed with various research laboratories like IIT, IMMT, NML, and Cement Industries for its productive utilization in construction applications, mine backfilling and cement application. We have also supplied one rake of red mud to one of our group cement industry at Vijayawada and R & D is going on for utilisation in cement manufacturing. Further, R & R works are going on in association with M/s Argus Concrete Solution, Chennai for use of red mud and fly ash in road construction.
3	Water spraying on the red mud pond shall be arranged to prevent fine dust from being blown off the stack. Longer-term treatment of the red mud shall include reclamation of the mud ponds, neutralization, covering with topsoil, and planting with vegetation.	Fixed rain gun water sprinkling system has been provided at red mud pond to prevent dust from red mud pond area. In addition to this, continuous water tanker deployed for water sprinkling on the roads around red mud pond.
4	Decanted water from red mud pond is collected in the Process Water Lake during the monsoon and the same water	The decanted water from the Red Mud Pond-A is collected in Pond-C and the same water is entirely recycled back to the process.



	recycled back to the process through pumping arrangements.	
5	100 % of the fly ash generated shall be utilised.	Presently fly ash is being used to fill low lying areas within the plant premises, dyke height increase, road making and supply to brick manufacturing units. The plant is situated at a remote place. There are only four fly ash brick manufacturing units around 20 km radius of the plant and no cement industry exists within 150 km radius of the plant. However, 4 more brick units through local entrepreneurship being developed in line with our CER intervention.
6	The company shall construct separate RCC drains for carrying storm water inside the plant.	Complied.
7	The water drawl shall not exceed 20,000 m ³ /day (existing and the expansion project put together).	Agreed.
8	An amount of Rs Rs. 135.8 Crores (2.5% of Project cost of Rs. 5432.00 Crore) proposed towards Corporate Environmental Responsibility shall be utilized as capital expenditure in project mode. The project shall be completed in concurrence with the implementation of the expansion and estimated on the basis of Scheduled Rates.	Agreed.
9	Green belt shall be developed in 353 Ha equal to 33% of the plant area with a native tree species in accordance with CPCB guidelines. The greenbelt shall inter alia cover the entire periphery of the plant.	Greenbelt around plant premises, railway corridor, red mud pond, ash pond, infrastructural areas have been developed by planting in 327 hectares of land up to the year 2018. Greenbelt development will continue in the coming years to achieve 353Ha.
10	The Capital cost Rs. 255.00 Crore and annual recurring cost Rs. 5.55 Crores towards the environmental protection measures shall be earmarked separately. The funds so provided shall not be diverted for any other purpose.	Agreed. The funds earmarked for environmental protection shall not be diverted for any other purpose. The recurring cost incurred during the FY 2018-19 is attached herewith in Annexure- II .
11	Kitchen waste shall be composted or converted to biogas for further use.	Agreed.
12	The project proponent shall (Air Quality Monitoring):	
	a. install 24x7 continuous emission monitoring system with respect to standards prescribed in Environment (Protection) Rules 1986 vide G.S.R 742 (E) dated 30th August 1990 and thereafter amended vide G.S.R 46 (E) dated 3rd February 2006 (Aluminium); S.O. 3305 (E) dated 7th December 2015(Thermal Power Plants) as	Existing: Continuous emission monitoring systems have been provided in the running Cogeneration thermal power plant and Calciners of the alumina refinery. These Continuous Emission monitoring systems have been connected with the servers of the SPCB & CPCB for continuous online transmission of the data through RTDAS. The CEMS is calibrated as per the supplier specification. Remote calibration



amended from time to time and connected to SPCB and CPCB online servers and calibrate these system from time to time according to equipment supplier specification through labs recognised under Environment (Protection) Act, 1986 or NABL accredited laboratories.

facility for the CPP gaseous emission has also been provided as per the CPCB guideline.

Proposed: Similar system shall be installed in the proposed expansion.

b. Monitor fugitive emissions in the plant premises at least once in every quarter through laboratories recognised under Environment (Protection) Act, 1986 or NABL accredited laboratories.

Fugitive emission monitoring is being carried out and the report is attached as **Annexure-III**.

c. Install system to carryout Continuous Ambient Air Quality monitoring for common/criterion parameters relevant to the main pollutants released (e.g. PM10 and PM2.5 in reference to PM emission, and SO2 and NOx in reference to SO2 and NOx emissions) within and outside the plant area at least at four locations (one within and three outside the plant area at an angle of 120° each), covering upwind and downwind directions;

Four numbers of CAAQMS have been installed as per the OSPCB directive to monitor the ambient air quality for the parameters PM₁₀, PM_{2.5}, SO₂, NO₂ and CO on continuous basis. These CAAQMS have been connected to OSPCB server through RTDAS to transmit online data.

d. submit monthly summary report of continuous stack emission and air quality monitoring and results of manual stack monitoring for calibrations of CEMS and manual monitoring of air quality /fugitive emission to Regional Office of MoEF&CC, Zonal office of SPCB along with

The results of continuous stack emission, manual stack monitoring and ambient air quality monitoring for the period October'18 to March'19 is attached as **Annexure-IV**.

The summary of stack emission & ambient air quality monitoring data during the period October'18 to March'19 is as below.

Calciner-A

Parameter	Max	Min	Avg	Norm
Particulate Matter mg/Nm ³	36.8	13.7	29.5	50
SO ₂ (mg/Nm ³)	303	280.5	293.1
NOx (mg/Nm ³)	128.7	95	108

Calciner-B

Parameter	Max	Min	Avg	Norm
Particulate Matter mg/Nm ³	33.2	9.0	26.6	50
SO ₂ (mg/Nm ³)	312.7	274.5	294.3



NOx (mg/Nm ³)	113.5	95.8	102.7
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From the above test results, it is evident that parameters are within the norm prescribed in the EC & CTO and no there is no deviation observed. Hence, complied.

CPP, Unit #1

Parameter	Max	Min	Avg	Norm
Particulate Matter mg/Nm ³	42.2	33.8	38.4	50
SO ₂ (mg/Nm ³)	412	393	401.5	600
NOx (mg/Nm ³)	200	177	189	300

CPP, Unit #2

Parameter	Max	Min	Avg	Norm
Particulate Matter mg/Nm ³	42.9	36	40.5	50
SO ₂ (mg/Nm ³)	391	278	353.1	600
NOx (mg/Nm ³)	197	92	164.8	300

CPP, Unit #3

Parameter	Max	Min	Avg	Norm
Particulate Matter mg/Nm ³	42	32.8	38.5	50
SO ₂ (mg/Nm ³)	408	374	391.4	600
NOx (mg/Nm ³)	196	103	166.8	300

From the above test results, it is evident that parameters are within the norm prescribed in the EC & CTO and no there is no deviation observed. Hence, complied.

Ambient Air Quality (AAQ)

Parameter	Max.	Min.	Avg.	NAAQS
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PM ₁₀ µg/m ³	65.5	55.8	58.5	60
PM _{2.5} µg/m ³	40	31.11	35.6	40
SO ₂ µg/m ³	10.4	7.35	8.9	50
NO ₂ µg/m ³	21.4	15.81	19.2	40
CO mg/m ³	0.3	0.2	0.3	04

From the above test results, it is evident that all the parameters are within the prescribed standard of National Ambient Air Quality and there is no deviation from NAAQS. Hence, complied.

13 The project proponent shall (Water Quality Monitoring):

a. install 24x7 continuous effluent monitoring system with respect to standards prescribed in Environment (Protection) Rules 1986 (G.S.R 742 (E) dated 30th August 1990 and further amended vide G.S.R 46 (E) dated 3rd February 2006 (Aluminium); S.O. 3305 (E) dated 7th December 2015 (Thermal Power Plants) as amended from time to time and connected to SPCB and CPCB online servers and calibrate these system from time to time according to equipment supplier specification through labs recognised under Environment (Protection) Act, 1986 or NABL accredited laboratories.

The waste water generated in the Alumina refinery are alkaline in nature. All these waste water from the process is centrally collected through a dedicated drainage system (RCC) in a concrete pond called the Caustic Pond bottom lined with LDPE. The waste water so collected is entirely recycled back to the process.

Similarly in the CPP, the blow down water from the Boilers and the Cooling Towers along with the DM Plant waste water are collected in a Holding Pond after sedimentation and neutralization. This water is also entirely reused for sprinkling in CHP, AHP, Roads and Ash conditioning.

Similarly, the surface run-off water is also collected centrally in a pond called the Guard Pond having neutralization system at the inlet with continuous pH monitoring. This water is also entirely recycled into the process for Red Mud washing.

Thus, The waste water generated is being reused in the process and no waste water is discharged to outside the plant as the plant operates on a Zero Discharge principle. The zero discharge condition is ensured by continuous surveillance through web camera and flow meter as per CPCB guidelines.

b. monitor regularly ground water quality at least twice a year (pre and post monsoon) at sufficient numbers of piezometers/sampling wells in the plant and adjacent areas through labs recognised under Environment (Protection) Act, 1986 and NABL accredited laboratories; and

Ground water quality is being monitored in and around the plant premises through labs recognised under Environment (Protection) Act, 1986 and NABL accredited laboratory M/s Visiontek Consultancy Services PVT. Ltd. Bhubaneswar. Refer **Annexure-V**



c. submit monthly summary report of continuous effluent monitoring and results of manual effluent testing and manual monitoring of ground water quality to Regional Office of MoEF&CC, Zonal office of CPCB and Regional Office of SPCB along with six-monthly monitoring report.

Agreed.

14 The project proponent shall (Air Pollution Control):

a. ensure ambient air quality around the project site as prescribed under National Ambient Air Quality Standards issued by the Ministry vide G.S.R. No. 826 (E) dated 16th November, 2009 (as amended from time to time).

Ambient air quality is being monitored by establishing six nos. of AAQ stations inside and outside the plant premises. The summary of the ambient air quality monitoring data during the period October'18 to March'19 is as below.

Ambient Air Quality (AAQ)

Parameter	Max.	Min.	Avg.	NAAQS
PM ₁₀ µg/m ³	65.5	55.8	58.5	60
PM _{2.5} µg/m ³	40	31.11	35.6	40
SO ₂ µg/m ³	10.4	7.35	8.9	50
NO ₂ µg/m ³	21.4	15.81	19.2	40
CO mg/m ³	0.3	0.2	0.3	04

From the above test results, it is evident that all the parameters are within the prescribed standard of National Ambient Air Quality and there is no deviation from NAAQS. Hence, complied.

b. provide appropriate Air Pollution Control (APC) system for all the dust generating points including fugitive dust from all vulnerable sources, so as to comply prescribed stack emission and fugitive emission standards.

Existing: Electrostatic precipitator (ESPs) designed to control particulate matter emissions within 50 mg/Nm³ and connected to the three boilers of the Power Plant & two Calciners of the Alumina Refinery with online monitoring system.

The following provisions have been made to control fugitive emission:

a) Dry mud stacking system has been adopted by installing Red Mud Filtration Unit. Dry mud is being stacked by compacting and water sprinkling to check fugitive emission, with rain gun type water sprinklers.

b) Bag filters have been provided at different locations and details of bag filters are as below.

Fixed high jet water spraying system have been installed at bauxite & coal handling areas. Wagon



		<p>Tippler with dry fog system at coal unloading area and closed type pipe conveyor system have been provided. Fully covered conveyors with water spraying system at transfer points for bauxite transportation have been provided.</p> <p>c) Two nos wet scrubbers at lime handling area have been provided.</p> <p>Proposed: Similar system shall be provided in the proposed expansion.</p>
	c. provide leakage detection and mechanised bag cleaning facilities for better maintenance of bags;	Agreed.
	d. provide sufficient number of mobile or stationery vacuum cleaners to clean plant roads, shop floors, roofs regularly;	Agreed.
	e. ensure covered transportation and conveying of ore, coal and other raw material to prevent spillage and dust generation;	Bauxite is transported through state of the art technology, Long Distance Conveyor (LDC).The entire conveyor length of 18.4 kms is covered with hood to prevent spillage & dust generation. In-plant Raw material conveyors like Bauxite, Lime etc. are covered. Coal is conveyed through a pipe conveyor. Other raw materials like lime and coal are transported through rail.
	f. provide covered sheds for raw materials like bauxite, coal, etc;	Covered shed is provided for coal & lime.
	g. recycle alumina dust collected in ESPs installed in calciner.	Alumina dust collected in ESP is recycled through pneumatic conveying system.
15	The project proponent shall (Water Pollution Control):	
	a. adhere to 'zero liquid discharge';	Already adopted.
	b. provide Sewage Treatment Plant for domestic wastewater; and	Provided.
	c. provide garland drains and collection pits for each stock pile to arrest the run-off in the event of heavy rains and to check the water pollution due to surface run off.	Provided.
16	The project proponent shall (Water Conservation):	
	a. practice rainwater harvesting to maximum possible extent; and	Bayer's process is alkaline in nature and hence rain water harvesting inside the plant is not possible. The rain water during rainy season is being collected in guard Pond, caustic pond and holding pond and the water is reused in the process avoiding usage of fresh water. However, six recharge pits have been constructed to harvest roof top rain water for ground water recharge at the township.



	b. reduce water consumption in bauxite beneficiation and alumina refinery by concentrating the solids in the tailings;	No bauxite beneficiation is envisaged. The tailings from alumina refinery is being disposed using High Concentration Slurry Disposal (HCSD) having 60% solids to red mud filtration unit as per the CREP guidelines and the reclaimed water is recirculated in the same process. The filtered cake is stored in the red mud pond.
17	The project proponent shall (Energy Conservation):	
	a. provide waste heat recovery system (pre-heating of combustion air) at the flue gases.	Agreed
	b. provide solar power generation on roof tops of buildings, for solar light system for all common areas, street lights, parking around project area and maintain the same regularly; and	Agreed
	c. Provide the project proponent for LED lights in their offices and residential areas.	LED lights have already been provided at plant as well townships.
18	Used refractories shall be recycled as far as possible.	Agreed
19	Oily scum and metallic sludge recovered from ETP shall be mixed, dried, and briquetted and reused.	No ETP is there in the refinery and we do not generate of oily scum and metallic sludge. We have already requested your good office to exclude this condition vide our letter no. UAIL/ENV/2018-19/96 dated 16.07.2018.
20	The project proponent shall prepare GHG emissions inventory and shall submit the programme for reduction of the same including carbon sequestration including plantation.	Noted for compliance.
21	Emergency preparedness plan based on the Hazard identification and Risk Assessment (HIRA) and Disaster Management Plan shall be implemented.	HIRA and Disaster Management Plan has been prepared and approved by Directorate of Factories & Boilers, Odisha.
22	The project proponent shall carry out heat stress analysis for the workmen who work in high temperature work zone and provide Personal Protection Equipment (PPE) as per the norms of Factory Act.	Agreed
23	The project proponent shall adhere to the corporate environmental policy and system of the reporting of any infringements/ non-compliance of EC conditions at least once in a year to the Board of Directors and the copy of the board resolution shall be submitted to the MoEF&CC as a part of six-monthly report.	Agreed
24	Ventilation system shall be designed for adequate air changes as per ACGIH document for all tunnels, motor houses.	Provided.



25	100% utilization of fly ash shall be ensured. All the fly ash shall be provided to cement and brick manufacturers for further utilization and Memorandum of Understanding in this regard shall be submitted to the Ministry's Regional Office.	Presently fly ash is being used to fill low lying areas within the plant premises, dyke height increase, road making and supply to brick manufacturing units. The plant is situated at a remote place. There are only four fly ash brick manufacturing units around 20 km radius of the plant and no cement industry exists within 150 km radius of the plant. Memorandum of Understanding with brick manufacturers is already submitted vide our Letter No. UAIL/ENV/2018-19/35.								
26	All the recommendations made in the Charter on Corporate Responsibility for Environment Protection (CREP) for the Aluminium Industry shall be implemented.	Red mud is being disposed off using High Concentration Slurry Disposal (HCSD) with 60% solids to red mud filtration unit as per the CREP guidelines. The filtered cake is stored in the red mud pond.								
27	A dedicated environmental cell with qualified personnel shall be established. The head of the environment cell shall report directly to the head of the organization.	An independent environment management cell has been established by the unit for monitoring of environmental parameters and implementation of effective control measures related to environment management. The head of the environment cell is directly reporting to the unit head of Utkal.								
28	Provision shall be made for the housing of construction labour within the site with all necessary infrastructure and facilities such as fuel for cooking, mobile toilets, mobile STP, Safe drinking water, medical health care, creche etc. The housing may be in the form of temporary structures to be removed after the completion of the project.	Mobile toilets, sewage treatment plant, safe drinking water, medical health care unit etc have been provided inside the proposed expansion site. As the existing plant is in running condition, the housing for the construction labour is provided outside the plant with all necessary infrastructure.								
29	The project authorities must strictly adhere to the stipulations made by the State Pollution Control Board and the State Government.	All the conditions stipulated in CTE & CTO are being complied.								
30	No further expansion or modifications in the plant shall be carried out without prior approval of the Ministry of Environment, Forests and Climate Change (MoEF&CC).	Agreed.								
31	The waste oil, grease and other hazardous waste shall be disposed of as per the Hazardous & Other waste (Management & Transboundary Movement) Rules, 2016.	Hazardous waste is being sold to the authorized recyclers/ reprocessors of CPCB as per the Hazardous & Other waste (Management & Transboundary Movement) Rules, 2016.								
32	The ambient noise levels should conform to the standards prescribed under EPA Rules, 1989 viz. 75 dB(A) during day time and 70 dB(A) during night time.	<p>Noise monitoring report is attached as Annexure-IV. Refer Annexure-VI. The summary of noise during the period October'18 to March'19 is as below.</p> <table border="1"> <thead> <tr> <th>Area</th> <th>Max</th> <th>Min</th> <th>Avg</th> </tr> </thead> <tbody> <tr> <td>Industrial (Day)</td> <td>72.7</td> <td>60.9</td> <td>69.5</td> </tr> </tbody> </table>	Area	Max	Min	Avg	Industrial (Day)	72.7	60.9	69.5
Area	Max	Min	Avg							
Industrial (Day)	72.7	60.9	69.5							



Industrial (Night)	63.6	50.8	58.3
Residential (Day)	53.8	45.4	50.6
Residential (Night)	42.9	37.8	46.5

From the above test results, it is evident that Noise levels are within the prescribed norm and no deviation is observed from Ambient air quality standard in respect of Noise for industrial and residential areas. Hence, complied.

33	Occupational health surveillance of the workers shall be done on a regular basis and records maintained as per the Factories Act.	<p>1. Pre-employment Health check-up is being carried out for all the employees at the time of joining.</p> <p>2. As per The Factories Act –1948 periodical Health check-up is being carried out on annual basis for all the employees and records are maintained and submitted to the Director of Factories & Boilers, Odisha.</p>
34	The project proponent shall also comply with all the environmental protection measures and safeguards recommended in the EIA/EMP report.	Agreed.
35	The project proponent shall (Post-EC Monitoring):	
	a. send a copy of environmental clearance letter to the heads of Local Bodies, Panchayat, Municipal bodies and relevant offices of the Government;	Complied
	b. put on the clearance letter on the web site of the company for access to the public.	Complied. Environmental Clearance (EC) was uploaded in our company website (http://www.hindalco.com/upload/pdf/EC-alumina-refinery-expansion-power-plant-90MW-2018.pdf)
	c. inform the public through advertisement 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 that the project has been accorded environmental clearance by the Ministry and copies of the clearance letter are available with the SPCB and may also be seen at Website of the Ministry of Environment, Forests and Climate Change (MoEF&CC) at http://envfor.nic.in .	Complied. The same was published in local newspapers namely "The political business daily" and "The Sambada Kalika" that are widely circulated in the region.
	d. upload the status of compliance of the stipulated environment clearance conditions, including results of monitored data on their website and update the same periodically;	It is being complied. The status of compliance of the stipulated environmental clearance conditions including the results of monitored data is being submitted along with half yearly compliance report and the same is uploaded periodically in



		our website (http://www.hindalco.com/upload/pdf/half-yearly-EC-compliance-UAIL-refinery-April19 to September.pdf)
	e. monitor the criteria pollutants level namely; PM ₁₀ , SO ₂ , NO _x (ambient levels as well as stack emissions) or critical sectoral parameters, indicated for the projects and display the same at a convenient location for disclosure to the public and put on the website of the company;	Ambient air quality and stack emission monitoring is being carried out and the results of the monitored parameters are displayed through digital display board at main gate for the public view. These monitored results are uploaded periodically in our website (http://www.hindalco.com/upload/pdf/half-yearly-EC-compliance-UAIL-refinery-oct17-march18.pdf)
	f. submit six monthly reports on the status of the compliance of the stipulated environmental conditions including results of monitored data (both in hard copies as well as by e-mail) to the Regional Office of MoEF&CC, the respective Zonal Office of CPCB and the SPCB;	Agreed. Six monthly reports are being submitted regularly to Regional Office of the Ministry at Bhubaneswar / Central Pollution Control Board / SPCB, Odisha.
	g. submit the environmental statement for each financial year in Form-V to the concerned State Pollution Control Board as prescribed under the Environment (Protection) Rules, 1986, as amended subsequently and put on the website of the company;	Complied. Environmental Statement for the year 2017-18 has already been submitted vide our letter No. UAIL/ENV/2018-19/27 dated 16-09-2018.
	h. 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.	Agreed.
25	The Ministry may revoke or suspend the clearance, if implementation of any of the above conditions is not satisfactory.	Agreed.
26	The Ministry reserves the right to stipulate additional conditions if found necessary. The company in a time bound manner shall implement these conditions.	Agreed.
27	The PP shall abide by all the commitments and recommendations made in the EIA/EMP report and that during their presentation to the EAC. The commitment made by the project proponent to the issue raised during Public Hearing shall be implemented by the proponent	Agreed.
28	The above conditions shall be enforced, inter-alia under the provisions of the Water (Prevention & Control of Pollution) Act, 1974, the Air (Prevention & Control	Agreed.



	of Pollution) Act, 1981, the Environment (Protection) Act, 1986, Hazardous and Other Wastes (Management and Transboundary Movement) Rules, 2016 and the Public Liability Insurance Act, 1991 along with their amendments and rules.	
29	This EC is issued in suppression of the earlier EC vide F. No. J-11011/753/2007-IA-II(I) dated 29.01.2018	Agreed.
30	This is EC issued subject to the outcome of the court case in W.P.No. 5697 of 2007 (Prafulla Samantray Vs Union of India & Others) before High Court of Odisha.	Agreed.
31	Any appeal against this EC shall lie with the National Green Tribunal, if preferred, within a period of 30 days as prescribed under Section 16 of the National Green Tribunal Act, 2010.	Agreed.

