

## URANIUM CORPORATION OF INDIA LIMITED

### Status of Environmental Compliance of the Ore Processing Plant Turamdih as on March 2014

(MoEF No. No. J-11011/9/86-IA dated 30<sup>th</sup> April 1987)

Please find the status of compliance of environmental condition as stipulated by the ministry:

1. *At 100 meter wide green belt of mixed species, within the periphery of the plant must be developed. The width of the greenbelt shall be 250 meters in the down wind direction prevailing most of the time.*

Derived area of total green belt by measuring 100 m width around the periphery of plant and 250 m width in the down wind direction is about 26 ha. As the total plant area including ETP is about 35 ha and hence it is not feasible to maintain the greenbelt area as derived above. We have developed greenbelt / plantation in the available area of about 6.0 ha along periphery and vacant space within the plant. Rest of greenbelt / plantation area i.e. 20 ha shall be developed within acquired area of Turamdih mine and township. We request for reconsideration of the total required greenbelt development within plant due to space constraints. Ore processing plant and township is under the mining lease area of Turamdih Mine.

Total 35000 number of tree plantation of local species has been done within mine, plant and township which cover about 27 ha area upto year 2012-13.

2. *Slum development near the periphery of UCIL complex should not be permitted.*

There is no slum area has developed in and around the UCIL complex. Company provides accommodation to all employees and long term contract workers within township. UCIL encourage employment from nearby villages for petty work.

3. *LSHS should be used in boiler houses instead of fuel oil.*

Furnace oil (FO) is currently used as fuel in boilers, due to unavailability of Low Sulphur Heavy Stock (LSHS) oil in the market. Necessary license for storage of FO from the Department of Explosive and District Authority have been obtained. Use of Furnace Oil (FO) in the existing boiler will be replaced with LDO after necessary modification in the storage license and handling system.

4. *The stacks (S6, S4, S7) heights for the dust extraction system of*

- a) *Primary jaw crushers (S6),*
- b) *Screening section (S4),*
- c) *Drying and packaging system (S7) should be raised to 35m*

Height of stacks of crushing (S6) and screening section (S4) are 33 m. At both locations, wet type dust extraction systems have been installed.

5. *In the ore grinding section, adequate dedusting system should be provided.*

De-dusting system in ore grinding and at other locations have been installed. Dust extraction having dry as well wet scrubbing systems are attached to crushing plant, lime plant and pyrolusite plant to control the emission. Stack monitoring results during march 2014 shows that Particulate Matter concentration in flue gas is 17 mg/ Nm<sup>3</sup> at Mill House, 65 mg/ Nm<sup>3</sup> at Lime Stone Plant and <5 mg/ Nm<sup>3</sup> at Pyrolusite Plant which are within permissible limit (150 mg/ Nm<sup>3</sup>).

6. *Sulphuric acid plant stack must have sampling point for regular monitoring of emissions particularly with respect to sulphurdioxide and acid mist. On line continuous monitoring systems have to be provided with all the stacks mentioned in (4) above.*

UCIL has decided not to construct the Sulphuric acid plant due to easy availability of sulphuric acid at nearby area. Sulphuric acid from the manufacturing unit is transported through tankers. About 15 days stock of acid is stored in MS tanks in the plant area.

7. *To prevent excessive emission of SO<sub>2</sub> and acid mist frequent start up and shut down of sulphuric acid plant should be avoided.*

Not applicable as described in point no. 6.

8. *A collection pond must be made for all waste waters from sulphuric acid plant/ processing plant area viz cooling water blow down, boiler blow down, DM plant wastewater, washing etc. including sewage effluent and treatment system for each of the effluent streams as necessary should be put up in consultation with the Bihar State Pollution Control Board.*

Effluents from utilities e.g. boiler blow down, cooling tower blow down etc. are collected and recycled to tailings pond. Washing and process effluent is treated in ETP.

9. *The treated effluent of tailings pond must always contain excess sulphate ions to ensure minimal residual Barium ion.*

The effluent contains required concentration of sulphate (around 600 ppm) which ensures minimum barium ion in treated effluent.

10. *All the ponds should be provided with impervious lining so that seepage and percolation does not take place.*

All tanks of Effluent Treatment Plant are made of RCC. As far as Tailings pond is concerned, permeability value of less than  $1 \times 10^{-9}$  m/s has been maintained which will enable to prevent seepage & percolation.

11. *Treated effluent should be discharged only through closed routing and should join the mid stream of the Kharkai River through pipelines and diffusers. Quality of the river has*

*to be preserved even during lean season. For this, regular continuous monitoring of river water should also be done.*

Effluent is treated in Effluent Treatment Plant. Part of treated effluent is recycled and excess is discharged to natural drain, which ultimately merges with the Kharkhai River. Monitoring results of 2 water samples of the Kharkhai river during November 2013 and January 2014 shows that pH, Total Dissolved Solid, Turbidity, Chloride, Sulphate, Total Hardness as CaCO<sub>3</sub>, Total Alkalinity, Nitrate Nitrogen, Calcium Magnesium, Nitrate and heavy metals (Cd, Cr, Cu, Fe, Mn, Pb, Zn) are within drinking water standards. U (nat) and <sup>226</sup>Ra values analyzed during November 2013 are 0.9 µg/l and 4mBq/l respectively which are well within limits of drinking water standards (U- 60 µg/l and <sup>226</sup>Ra -300 mBq/l).

Proposal for conveyance system including construction of ponds for large exposed area to enable evaporation of effluent and disposal of excess treated effluent through closed routing to mid stream of the Kharkhai couldn't be materialized due to non availability of land. In the present context, the effluent treatment plant has been relocated & modified for increased dose of barium hydroxide treatment for sulfate removal. Facility has been developed to monitor Barium concentration in treated effluent. Request has been made to MoEF to consider the treated effluent discharge through natural drain, ultimately merged to the Kharkhai River.

- 12. Liquid effluent should meet ISI 2490 and IS 2296. The stipulation of emission and ambient air standards of the central Pollution Control Board should be complied with. In case, the standards of the Bihar State Pollution Control Board are more stringent than those of the central Pollution control Board then state Board norms are to be adopted.*

Treated effluent is monitored regularly. The parameters is compared with general standards for discharge of environmental pollutants for inland water surface as per standards prescribed under GSR 422(E) dated 19th May 1993 and 31st December 1993.

Monitoring results of 6 treated effluent during October 2013 to March 2014 shows that pH, Total Suspended Solid, BOD<sub>5</sub>, COD, Oil & Grease, heavy metals (Cd, Cr, Cu, Fe, Mn, Pb, Zn, Se, V and Ni) are within the prescribed standards. Gross alpha (α) and Gross Beta (β) in treated effluent during October 2013 to February 2014 (5 samples) varies as 1.3 to 2.3 Bq/l and 1.8 to 2.3 Bq/l respectively which are within the permissible limits (Gross alpha : 3.7 Bq/l and Gross beta 37 Bq/l). 12 ambient air samples were collected from two locations within premises during October 2013 to march 2014. The value of PM<sub>10</sub>, PM<sub>2.5</sub>, SO<sub>2</sub>, NO<sub>x</sub>, Pb and Ni are within the permissible standards of NAAQS-2009. Noise level at above locations were found within permissible limit which vary from 47 to 70 db(A).

- 13. The quality of the tailings pond liquid and that of the effluents should be such that any individual member of the public should not receive more than annual dose equivalent of 100 mrem (above the natural background exposures) from these sources.*

Monitoring results of operational tailing ponds of UCIL has revealed that the annual dose to the individual member has never exceeded the prescribed limits. The same condition shall be maintained at tailing pond of Turamdih.

*14. Concentration of Ra-226 in drinking water should not exceed 24 pci per litre.*

Concentration of <sup>226</sup>Ra in drinking water shall not exceed the prescribed limit. Ra-226 value in source of drinking water supply is furnished in point no. 11.

*15. Rain water of the complex also requires collection and on line continuous monitoring before discharge into the Kharkai river.*

Rain water of critical areas of the complex like stock pile and waste dump yard is collected and recycles for industrial use.

*16. Adequate on line continuous monitor with recording systems must be provided for the treated effluents before discharge into the Kharkai river.*

On-line continuous monitor has been installed at ETP before discharge of effluent.

*17. Ground water should be monitored around the tailing pond area particularly.*

Monitoring wells have been constructed around the tailing pond to monitor groundwater quality. Regular monitoring of ground water is done by HPU of BARC. pH, U (Nat) and <sup>226</sup>Ra values of 20 ground water samples during October 2013 to December 2013 varies as 6.5 to 8.7, <0.5 to 26.1 µg/l and 5-54 mBq/l respectively.

*18. Details of monitoring equipment instruments and development of associated facilities for monitoring of emissions, ambient air and liquid effluents should be provided to the Ministry of Environment and forests.*

An environmental engineering laboratory has been established at Turamdih to cater the need of UCIL's operations. Apart from above, Environmental Surveillance Laboratory of Bhabha Atomic Research Center at Turamdih has started functioning for comprehensive environmental monitoring. List of equipment used for environmental monitoring is annexed herewith.

*19. Recommendations made in the mannual for "Health and Safety Practices in Turamdih Processing Plant" should be strictly implemented.*

Approved practice of Health & Safety requirement as per AERB guideline is being followed at Turamdih Ore Processing Plant.

*20. Environmental monitoring report should be submitted on six monthly basis to the Ministry of Environment & Forests.*

Environmental monitoring report is being submitted to MoEF on six monthly basis.

*21. Any significant change in the operations/ design of the plant which might create substantial change in the hazards / to the Ministry of Environment & Forests for approval.*

Any significant change in the operations/design of the plant which might create substantial change in the hazards will be intimated to the Ministry of Environment & Forest for approval. We have applied to the ministry for environmental clearance for ore processing capacity enhancement from 3000 TPD to 4500 TPD.

*22. A monitoring committee shall be set up, in consultation with the Department of Environment, to ensure that the conditions stipulated are effectively implemented. The committee shall have the powers to order engineering works / or operations of the plant to cease if so warranted, on environmental grounds. Further, the industry may be asked to prepare or carry out any study on environmental aspect and submit its report to the Department of Environment.*

We have constituted a monitoring committee which includes following:

- (i). In-Charge of Health Physics Unit of BARC at Turamdih
- (ii). In-charge, Environmental Engineering Cell of UCIL
- (iii). Chief Superintendent (Mill) of UCIL,

*23. The Ministry of Environment & Forests reserve the option to revise/ prescribe any other condition(s) for implementation as are considered necessary for protection of the environment, public health and ecological balance in the region.*

Noted.

*24. The project authorities are requested to follow the procedure laid down for clearance under the Forest conservation Act, 1980 to obtain necessary approvals. The present clearance should not be construed as an assurance that clearance from Forest Conservation Act will be allowed.*

Forest clearance under Forest Conservation Act, 1980 has been obtained.

**Annexure**

**List of equipment used for environmental monitoring**

<b>Sr. No.</b>	<b>Description</b>	<b>Quantity</b>
1	Multiparameter (pH, TDS, DO, Temp)	1
2	Turbidity meter	1
3	COD Thermo reactor	1
4	BOD incubator	1
5	Heating Mantle	2
6	Magnetic Stirrer	2
7	Hot Plate	1
8	Jar Test Apparatus	1
9	Filter Assembly with Vacuum Pump	1
10	Thermometer (wet & dry)	1
11	Sound meter	1
12	Refrigerator	1
13	PM10 / PM2.5 Air Sampler	4
14	Air Sampler Attachment	4
15	Water measuring system	2
16	Microscope	1
17	Titration table	1
18	Fume hood	1
19	Muffle furnace	1
20	Oven	1
21	Analytical Balance	1
22	Photometer	1
23	ICP	1

Note: Health Physics Unit of BARC equipments are not included in the above listed equipments.