

FOR ORE PROCESSING PLANT TURAMDIIH

Status of compliance of the environmental clearance with respect to Ore Processing Plant at Turamdih as on September 2017

Sl. No.	Condition	Status of Compliance
i.	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, hence it is not feasible to maintain the required 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 39600 number of tree plantation of local species has been done within mine, plant and township which cover about 31 ha area up to year 2016.
ii.	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.
iii.	LSHS should be used in boiler houses instead of fuel oil.	At present Furnace oil (FO) is used 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 boilers will be replaced with LDO after necessary modification in the storage license and handling system.
iv.	The stacks (S6, S4, S7) heights for the dust extraction system of : a). Primary jaw crusher(S6), b). Screening section (S4), c). Drying and packaging system (S7) should be raised by 35m	Height of dust extraction stacks at Mill section has been increased by 2 m to achieve the desired height of 35 m.

v.	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 as wet scrubbing systems attached to crushing plant, lime plant and pyrolusite plant to control the emission. Stack monitoring results shows that Particulate Matter concentration in flue gas is 69, 79, & 100 mg/ Nm ³ of Fine Screen House, Crushing Plant & Mill House respectively.
vi.	Sulphuric acid plant stack must have sampling point for regular monitoring of emissions particularly with respect to sulphur dioxide 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.
vii.	To prevent excessive emission of SO ₂ and acid mist frequent start up and shut down of sulphuric acid plant should be avoided.	Not applicable as described in point no. 6.
viii.	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.
ix.	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 1000-1500 ppm) which ensures minimum barium ion in treated effluent. Concentration of Barium ion in treated effluent less than 0.5 mg/l.
x.	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 1×10^{-9} m/s has been maintained by surface treatment which will enable to prevent seepage & percolation.
xi.	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 Kharkhai River. Monitoring results of Kharkhai water during January 2017 is attached. Uranium (nat) and ²²⁶ Ra values in up and downstream of Kharkhai river analyzed during January 2017 varies from 4.1 to 15.5 µg/l and less than 4.0 Bq/l

		<p>respectively which are well within limits of drinking water standards (U: 60 µg/l and ²²⁶Ra: 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 Kharkai 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 on weekly basis. Barium concentration in treated effluent samples during April to September 2017 is less than 0.5 mg/l. It is request to consider the treated effluent discharge through natural drain, ultimately merged to the Kharkhai River.</p>
xii.	<p>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.</p>	<p>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 samples during October 2016 to March 2017 shows that pH, TSS, BOD, COD, Oil & Grease, heavy metals (Cd, Cr, Cu, Fe, Pb, Zn, V, Mn and Ni) are within the prescribed standards. Gross alpha (α) and Gross Beta (β) in treated effluent during April to September 2017 in 5 samples varies as 0.7 to 0.9 Bq/l and 1.3 to 1.7 Bq/l respectively which are within the permissible limits (Limits:- Gross alpha: 3.7 Bq/l and Gross beta: 37 Bq/l).</p> <p>12 ambient air samples were collected from two locations within premises during April to September 2017. The value of PM₁₀, PM_{2.5}, SO₂, NO_x, Pb and Ni are within the permissible standards of NAAQS-2009.</p> <p>Noise levels at above locations were found within permissible limit which vary from 59 to 70 db (A). Radon concentration and Gamma radiation values around the tailing pond area are attached herewith.</p>

xiii.	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 have revealed that the annual dose to the individual member has never exceeded the prescribed limits. The same condition is being maintained at tailing pond of Turamdih.
xiv.	Concentration of Ra-226 in drinking water should not exceed 24 pci per litre.	Concentration of ²²⁶ Ra in drinking water shall not exceed the prescribed limit. Ra-226 value in source of drinking water supply is furnished in point no. XI.
xv.	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 recycled for industrial use.
xvi.	Adequate online continuous monitor with recording systems must be provided for the treated effluents before discharge into the Kharkai river.	On-line pH continuous monitor has been installed at ETP before discharge of effluent.
xvii.	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. U (Nat) and ²²⁶ Ra values of 28 ground water samples during April to September 2017 varies as 0.5 to 2.3 µg/l with median value 1.1 µg/l and 4 to 43 mBq/l with median value 7.0 mBq/l respectively.
xviii.	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 attached.
xix.	Recommendations made in the manual 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.
xx.	Environmental monitoring report should be submitted on six monthly basis to the Ministry of Environment & Forests.	Environmental monitoring report is being submitted to MoEF&CC on six monthly basis.
xxi.	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.

xxii.	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.	<p>We have constituted a monitoring committee which includes following:</p> <ul style="list-style-type: none"> I. In-Charge of Health Physics Unit of BARC at Turamdih II. In-charge, Environmental Engineering Cell of UCIL III. Head of the Ore Processing Plant, Turamdih UCIL <p>Compliance is reviewed on periodical basis.</p>
xxiii.	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.
xxiv.	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.

Analysis Results of Downstream of Kharkai River

Sl. No.	Parameters	Date of Sampling	
		11.04.17	03.08.17
1	pH	7.8	7.2
2	Total Dissolved Solid (mg/l)	265	169
3	Turbidity (NTU)	1.13	113
4	Total Suspended Solid (mg/l)	04	0.7
5	Chloride (mg/l)	48	11
6	Sulphate (mg/l)	127	168
7	Total Hardness as CaCO ₃ (mg/L)	100	78
8	Calcium as Ca (mg/l)	72	25
9	Magnesium as Mg(mg/l)	23	07
10	Total Alkalinity (mg/L)	140	76
11	Free Chlorine (mg/L)	0.18	0.30
12	BOD 5 at 20°C (mg/l)	08	12
13	COD (mg/l)	21	29
14	Aluminium as Al (mg/l)	0.18	1.5
15	Cadmium as Cd (mg/l)	<0.1	<0.1
16	Total Chromium as Cr (mg/l)	<0.05	<0.05
17	Copper as Cu (mg/l)	<0.05	<0.05
18	Iron as Fe (mg/l)	0.9	2.2
19	Manganese as Mn (mg/l)	0.15	<0.1
20	Lead as Pb (mg/l)	<0.1	<0.1
21	Zinc as Zn (mg/l)	<1.0	<1.0
22	Nitrate Nitrogen as NO ₃ —N (mg/l)	08	07
23	Selenium as (mg/l)	<0.1	<1.0
24	Barium as Ba (mg/l)	0.88	<0.5
25	Cyanide as CN (mg/l)	0.01	0.02
26	Boron as B (mg/l)	<0.5	<0.5
27	Nickel as Ni (mg/l)	<0.01	<0.01
28	Sulphide as S (mg/l)	0.04	0.08
29	Fluoride as F (mg/l)	0.57	0.54

Note: Sampling & analysis has done by Environmental Engineering Cell, Turamdih.

Absolute Radon concentration around Tailing Pond

Sl. No.	Location	Date of Survey	Abs. 222Rn conc. (Bq/m3)
1.	Eastern side, Tailings pond on Bund wall	08.04.17	33 \pm 17
2.	Southern side, Tailings pond	08.04.17	18 \pm 08
3.	Western side, Tailing pond on Bound wall	06.05.17	30 \pm 12
4.	Northern side , Tailing pond	06.05.17	24 \pm 10
5.	Easter side, Tailing Pond on road	26.06.17	22 \pm 11
6.	Southern side, Tailings pond	26.06.17	14 \pm 07
7.	Western side, Tailing pond on road	15.07.17	19 \pm 08
8.	Northern side , Tailing pond	15.07.17	15 \pm 07
9.	Eastern side, Tailings pond on Bund wall	03.08.17	24 \pm 10
10.	Southern side, Tailings pond	03.08.17	21 \pm 09
11.	Western side, Tailing pond on road	03.08.17	18 \pm 08
12.	Northern side , Tailing pond	03.08.17	21 \pm 09

Gamma Radiation Survey around Tailing Pond

Sr. No.	Location	Date of Survey	gamma-radiation microGyh ⁻¹
1.	Eastern side, Tailings pond on Bund wall	08.04.17	0.15-0.25
2.	Southern side, Tailings pond	08.04.17	0.08-0.18
3.	Western side, Tailing pond on Bound wall	06.05.17	0.14-0.21
4.	Northern side , Tailing pond	06.05.17	0.13-0.28
5.	Eastern side, Tailing Pond on road	26.06.17	0.06-0.12
6.	Southern side, Tailings pond	26.06.17	0.06-0.15
7.	Western side, Tailing pond on road	15.07.17	0.10-0.23
8.	Northern side , Tailing pond	15.07.17	0.11-0.28
9.	Eastern side, Tailings pond on Bund wall	03.08.17	0.14-0.44
10.	Southern side, Tailings pond	03.08.17	0.08-0.14
11.	Western side, Tailing pond on Bound wall	03.08.17	0.22-0.42
12.	Northern side , Tailing pond	03.08.17	0.10-0.31

List of equipment used for environmental monitoring

Sr. No.	Description	Quantity
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
24.	UV-VIS Spectrophotometer	1

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