

Compliance Status of Environmental Condition with respect to Jaduguda Mine and Ore Processing Plant Uranium Corporation of India Limited as on September 2025

SL. No.	Specific Condition	Compliance
i.	<i>The project proponent shall obtain Consent to Establish from the State Pollution Control Board and effectively implement all the conditions stipulated therein.</i>	Consent to Establish has been obtained from Jharkhand State Pollution Control Board (JSPCB) vide reference no. PC/NOC/JSR/68/09/G-2439 dated 21.12.2012. Status of the compliance of the conditions stipulated therein has been submitted to JSPCB vide letter no. UCIL/ENV/JAD/JSPCB/71/2023 dated 25.08.2023. JSPCB has granted Consent to Operate vide letter no. JSPCB/HO/RNC/CTO-16927663/2024/279 dated 23.02.2024 valid up to 31.12.2026.
ii.	<i>The environmental clearance is subject to approval of the State Landuse Department, Government of Jharkhand for diversion of agricultural land for non-agricultural use.</i>	Jaduguda Mine and Ore Processing Plant started in year 1967. Government of Jharkhand (formerly Bihar) has already delivered the possession of private land (agricultural land) in favor of Uranium Corporation of India Limited, for setting of uranium mine & ore processing facility. In principle, agricultural land has been acquired for non-agricultural purpose. No additional land (agricultural) is required for expansion and renewal of mining lease as all the activities are confined to the existing premises only.
iii.	<i>The environmental clearance is subject to grant of forestry clearance. The project proponent shall obtain requisite prior forestry clearance under the Forest (Conservation) Act, 1980 for working in the forest area.</i>	The Ministry of Environment & Forest, Government of India has granted the forestry clearance for the mine, processing plant and tailing pond under the Forest (Conservation) Act, 1980 vide letter No.8-49/97-FC dated 20.04.1998 and 12.02.2004. The Ministry has granted Stage-II Forest Clearance (renewal) of 134 ha forest area within lease vide letter no. 8-07/2016-FC dated 06.08.2018.
iv.	<i>The project proponent shall ensure that no natural watercourse and/or water resources shall be obstructed due to any mining operations.</i>	No natural watercourse and water resources have been obstructed due to underground mining activity at Jaduguda.
v.	<i>The top soil should be stacked at earmarked site(s) only with adequate measures and it should not be kept unutilized for a period more than 3 years. The topsoil should be used for land reclamation and rehabilitation of mined out areas.</i>	Not applicable as method of mining is underground. Top soil is not available.
vi.	<i>Regular monitoring of subsidence movement on the surface over working</i>	Cut and fill method of underground mining is being practiced in Jaduguda Mines. The voids

SL. No.	Specific Condition	Compliance
	<i>area and impact on water bodies / vegetation / structures / surrounding shall be continued till movement cases completely. In case of observation of any high rate of subsidence movement, appropriate measures shall be taken to avoid loss of life and material. Cracks shall be effectively plugged with ballast and clayey soil / suitable material.</i>	created during mining activities are filled up with waste rock and sand. Therefore subsidence is not envisaged. This practice has been adopted since four decades at Jaduguda Mines and no subsidence has been observed during mining operation.
vii.	<i>All the mine entries shall be above the highest flood level to avoid any anticipated flooding of mine from the surface water during the rainy season.</i>	The mine entry level of Jaduguda Mines is 115.037 mRL which is above the HFL (100 mRL).
viii.	<i>In areas where subsidence is anticipated in shallow uranium ore occurrence, such areas be identified and provided with garland drains to ensure draining of water and avoid ingress of the same in to the underground mine.</i>	Subsidence is not envisaged as explained in sl. no. (vi). Necessary action has been taken to avoid ingress of water into the mine. A garland drain has been constructed to divert the rain water around the mine entry. The mine entry level (115.037 mRL) is above the HFL (100 mRL).
ix.	<i>The project authorities shall check the possibility of existence of fault(s) before deciding about the thickness of safe barrier required to be maintained between the working face and the water bodies, if any, in consultation with the Director General Mines & Safety (DGMS). De-pillaring should also be carried out after taking prior approval of the DGMS.</i>	No water body exists within core zone of the project. However, necessary permission has been obtained from the Director General of Mines & Safety (DGMS) for working below nullah (a seasonal river) vide its letter no. 575 dated 05.02.2003. Copy of permission letter has been submitted to the ministry vide our letter no. UCIL/JAD/MoEFCC/11/2022 dated 26.05.2022.
x.	<i>The project proponent shall carry out conditioning of the ore with water to mitigate fugitive dust emission, without affecting flow of ore in the ore processing and handling areas.</i>	Water sprinkling is done to mitigate fugitive dust emission in the ore processing plant and ore handling areas. Water sprinklers have been installed at grizzly and conveyor belts in ore processing plant as shown in photograph. Total fugitive dust monitoring carried out during April to September 2025 in ground hopper area, crushing area, screening area & grinding area of ore processing plant. Photographs showing conditioning of the ore with water during unloading of the ore is attached. Photograph showing water sprinkling in haul road is attached and details of the log book of running hours of the water tanker is also attached. In addition to above, as directed by the ministry on its letter dated 06.09.2022 for further mitigation of dust, fog cannon system has been also procured and installed. Photograph is attached.
xi.	<i>The effluent from the ore beneficiation</i>	The effluent from ore beneficiation plant is

SL. No.	Specific Condition	Compliance
	<i>plant shall be treated to conform to the prescribed standards and the tailing slurry shall be transported through a closed pipeline to the tailing dam.</i>	treated in Effluent Treatment Plant (ETP). Part of treated effluent is recycled in the process and excess is discharged to Gara river. Monitoring of treated effluent is done regularly. The tailing slurry is transported to tailing pond through a rubber lined mild steel pipelines. Photograph is attached.
xii.	<i>The decanted water from the tailing dam shall be re-circulated and there should be zero discharge from the tailing dam.</i>	The decanted water from the tailing pond is collected through RCC drain and treated in Effluent Treatment Plant. Part of the treated water is being reused in the processing plant. Excess treated effluent from ETP is discharged as per inland water discharge standards. There is no discharge from tailing pond to the environment. Photograph of drain system and ETP is attached.
xiii.	<i>The project proponent shall develop effective emergency response procedure to ensure appropriate risk management measures in the public domain, if any, due to project.</i>	Emergency response preparedness plan is available for Jaduguda Mines and Ore Processing Plant. It has been prepared as per the DGMS and AERB guidelines. Copy of the Emergency Response Plan approved by DGMS (No. 600001/579 dated 01.03.2006) has been submitted to the Ministry vide our letter no. UCIL/ENV/JDU/MoEFCC/03/2020 dated 25.05.2022. In addition to above, we have a dedicated Environmental Monitoring Laboratory located at Jaduguda for radiological monitoring and emergency. Radiological Emergency Response Centre (RERC) has been set up at East Singhbhum, Region of Jharkhand at Jaduguda to cater any radiological related emergency.
xiv.	<i>Effective safeguard measures, such as regular water sprinkling shall be carried out in critical areas prone to air pollution and having high levels of particulate matters loading and unloading points & all transfer points. Extensive water sprinkling shall be carried out on haul roads. It should be ensured that the Ambient Air Quality parameters conform to the norms prescribed by the Central Pollution Control Board in this regard.</i>	Sprinkling of water on haul road and dusty area is done. Pucca haul road has been constructed for ore transportation. Results of Ambient Air Quality, Noise Level monitored & analyzed by M/s Biocrat Environmental Services LLP, Ranchi. The conditioning of the ore with water is done in unloading of the ore and water sprinkling arrangement along the transportation road near the unloading area is attached. In addition to above, as directed by the ministry on its letter dated 06.09.2022 for further mitigation of dust, fog cannon system has been installed. Photograph is attached.

SL. No.	Specific Condition	Compliance
xv.	<i>Plantation shall be raised in an area of 79ha including a 7.5m wide green belt in the safety zone around the mining lease, around processing plant, around tailing dam, roads etc. by planting the native species in consultation with the local DFO/Agriculture Department. The density of the trees should be around 2500 plants per ha.</i>	<p>A comprehensive greenbelt and plantation of tree has been developed around the project in an area of about 80.20 ha. The existing greenbelt and plantation are attached. Progressive plantation along the tailing dam will be carried out during time of reclamation.</p> <p>100 nos. of trees were planted along the pathway leading to tailing pond during the month of June 2025.</p>
xvi.	<i>The project authority should implement suitable conservation measures to augment ground water resources in the area in consultation with the Regional Director, Central Ground Water Board.</i>	<p>Rainwater harvesting scheme has been implemented at three locations: (i) Jaduguda Hospital, (ii) Jaduguda Township & (iii) HPU of BARC for augmentation of ground water resource.</p> <p>Rainwater harvesting recharge structure of size 9.80 m x 2.23 m having a catchment area of 6000 sq m has been constructed at above locations. The recharge trench consists of one number of ground water recharge well of depth 20 m inserted with perforated PVC pipe having 6" dia. Filter bed chambers of size 250 mm sand top layer 250 mm gravels and 250 mm and pebbles has been layered inside the recharge trench for filtration. The water channel and the bore well chambers are cleaned off dry leaves, grass and loose soil at regular intervals. Photograph is attached.</p>
xvii.	<i>Regular monitoring of ground water level and quality shall be carried out in and around the project area (mine lease, ore processing plant and tailing dam) by establishing a network of existing wells and installing new piezometers during the operation. The periodic monitoring [(at least four times in a year – pre-monsoon (April-May), monsoon (August), post-monsoon (November) and winter (January)); once in each season)] shall be carried out in consultation with the State Ground Water Board / Central Ground Water Authority and the data thus collected may be sent regularly to the Ministry of Environment and Forest and its Regional Office, Bhubaneswar, Central Ground Water Authority and Regional Director, Central Ground Water Board. If at any stage, it is observed that the ground water table is getting depleted due to the mining activity;</i>	<p>Ground water level is monitored from the network of existing wells in and around the mine lease area. Ground water levels monitored from the 09 nos. of existing well of surrounding villages during April & August 2025 vary as 3.25 m to 8.30 m & 0.60 m to 4.00 m respectively. Also, as per Section 14 of Guidelines of CGWA, we have constructed two no. of monitoring bore well at the core zone of Jaduguda mines to monitor the GW level and quality. Digital Ground water level recorder has been installed at one location to monitor the GW levels.</p> <p>A request letter w.r.t requirement of additional key wells, if any is required has also been made to Regional Office, CGWB vide our letter no. UCIL/ENV/JAD/CGWB/03/2022 dated 05.09.2022. The water quality from the nine locations during April & August 2025 meets the standard as per IS:10500. Uranium and Radium values in 16 ground water samples during May & August 2025 varies from 0.1-7.2 µg/l & 3.5-67 mBq/l respectively which are well within drinking water</p>

SL. No.	Specific Condition	Compliance
	<i>necessary corrective measures shall be carried out.</i>	standards (U- 60 µg/l and ²²⁶ Ra-300 mBq/l). The ground water level & quality monitoring reports are being sent to the Ministry, MoEFCC Regional Office, Ranchi, Central Ground Water Authority and Regional Director, Central Ground Water Board vide our letter no. UCIL/ENV/JAD/CGWB/03/2025 dated 03.05.2025. Ground water has also been monitored & analyzed by M/s Biocrat Environmental Services LLP, Ranchi.
xviii.	<i>The project authorities should obtain prior approval of the competent authority for drawl of surface water and ground water, required for the project.</i>	No groundwater is withdrawn for the project. A weir has been constructed in the year 1987 on Garanala to meet the water requirement of the project. Agreement for drawl of surface water (11000 m ³ /day) from Gara Nala, a Tributary of Subarnarekha River has been done on 29.05.2019 with Water Resource Department, Government of Jharkhand. NOC from CGWA has been received for Jaduguda Mines vide letter no NOC/MIN/JH/2025/12285/R-2/2 dated 07/10/2025 for dewatering during mining activity.
xix.	<i>The mineral handling plant should be provided with adequate number of high efficiency dust extraction system. Loading and unloading areas including all the transfer points should also have efficient dust control arrangements. These should be properly maintained and operated.</i>	In the ore processing plant high efficiency dust extraction system (HEPA filter) has been installed at drying and packaging area. Dust extraction and wet scrubbing systems have also been installed at crushing plant, lime plant and pyrolusite plant to control the emission. Ore transported from other mines is transported in a covered truck. Photographs showing ore transportation inside premises in covered truck is attached.
xx.	<i>Vehicular emissions should be kept under control and regularly monitored. Measures shall be taken for maintenance of vehicles used in mining operations and in transportation of mineral. Overloading of trucks should be avoided to stop spillage. The ore shall be transported through closed containment to prevent spillage.</i>	Ore from Jaduguda Mines is transported to processing plant through the conveyor belt. Ore from other UCIL's mine like Narwapahar, Bhatin and Bagjata is transported through covered truck. Regular maintenance of vehicles is done and overloading of truck is avoided to prevent the spillages during transportation.
xxi.	<i>Digital processing of the entire lease area using remote sensing technique should be done regularly once in three years for monitoring land use pattern and report submitted to Ministry of Environment and Forests and its Regional Office, Bhubaneswar.</i>	M/s Geovale Services Pvt. Ltd., Kolkata has conducted the land use and land cover study of Jaduguda Mines on 21.05.25. Land use/land cover study is attached. The Jaduguda mine lease area, primarily an underground uranium excavation site, exhibits a diverse distribution of land use and land cover (LULC) types. Greenbelt/Plantation dominates

SL. No.	Specific Condition	Compliance
		the area, accounting for 36.49% (141.68 hectare), followed by Forest land at 19.17% (74.43 Hectare), reflecting the region's ecological significance. Greenbelt and plantation areas highlight ongoing efforts toward environmental conservation. Agricultural land, settlements, opens or barren land, industrial establishments and infrastructure collectively occupy a significant portion of the lease area.
xxii.	<i>The project proponent should take all precautionary measures during mining operation for conservation and protection of endangered fauna such as giant squirrel, Indian elephant, pangolin, sloth bear, python etc. spotted in the study area in consultation with the concerned forest officials. Action plan so prepared for conservation of flora and fauna shall be implemented in consultation with the State Forest and Wildlife Department. Necessary allocation of funds for implementation of the conservation plan shall be made and the funds so allocated shall be included in the project cost. Copy of action plan shall be submitted to the Ministry of Environment and Forests and its Regional Office, Bhubaneswar within 3 months.</i>	<p>Endangered fauna are not spotted in the lease area. Only python has been reported for which action plan for conservation has been submitted to the ministry. Special training program on environment including conservation of python was conducted on 25.01.2014 at VTC Jaduguda.</p> <p>In addition, we have also prepared Site Specific Wildlife Conservation & Management Plan report for Jaduguda-Bhatin Uranium Complex in accordance with the guideline of PCCF (Wildlife) & Chief Warden Jharkhand vide its letter no. 302 dated 26.03.2015 and the same has been submitted to DFO, Jamshedpur on 15.06.2017. The report was reviewed and based on various comments and observations, necessary revision was made from time to time in consultation with DFO, Jamshedpur and was again submitted on 21.08.2019, 17.10.2020, 18.02.2021, 07.07.2021 and 30.07.2021.</p> <p>However, in the meeting held on 06.10.2021 with DFO, Jamshedpur it was opined that, the fund allocated for Jaduguda Uranium Complex needs to be revised. Accordingly after several meetings and consultation with forest department Site Specific Wildlife Conservation & Management Plan has been prepared with revised fund and activities and was submitted on 24.08.2022. Further, DFO vide its letter no 2397 dated 16.10.2023 has again asked for additional query related to maps and fund. Requisite document has been submitted to DFO vide our letter no. UCIL/ENV/Forest/WL/04/2024 dated 28.09.2024. However report has been returned on 18.07.2025 vide their letter no. 1570 dated 08.07.2025.</p> <p>Various measures have been undertaken and initiated for the conservation and protection for wildlife found in the area.</p>
xxiii.	<i>Monitoring of background radiation levels</i>	Monitoring of background radiation levels in

SL. No.	Specific Condition	Compliance										
	<i>in water, soil and ambient air should be carried out periodically in the study area (core and buffer zone) of the project.</i>	water, soil and ambient air (Gamma Radiation Survey) is carried out by Health Physics Unit of BARC in core & buffer zone of the mine. Uranium (0.1-7.2 µg/l) and radium (3.5-67 mBq/l) values in 16 ground water samples collected during May & August 2025 are well within drinking water standards (U: 60 µg/l and ²²⁶ Ra: 300 mBq/l). The environmental Gamma radiation survey conducted from April to September 2025 in work zone shows the variation as 0.10 to 4.80 µGy/hr which is within permissible limits (8.0 µGy/hr).										
xxiv.	<i>The plants growing in the area, soil invertebrate animals and local agricultural produce should be analyzed to check the build up of radioactivity levels, if any.</i>	Analysis of invertebrate animals (snail) within mining lease has been analyzed by Health Physics Unit, BARC to check the buildup of radioactivity levels. Results are as under: <table><tr><td>Date of Sampling</td><td>U (Nat) (mg/kg)</td><td>²²⁶Ra (Bq/kg)</td><td>Th (Bq/kg)</td><td>²¹⁰Po (Bq/kg)</td></tr><tr><td>30.07.25</td><td><0.1</td><td>0.7</td><td>0.4</td><td>6.1</td></tr></table>	Date of Sampling	U (Nat) (mg/kg)	²²⁶ Ra (Bq/kg)	Th (Bq/kg)	²¹⁰ Po (Bq/kg)	30.07.25	<0.1	0.7	0.4	6.1
Date of Sampling	U (Nat) (mg/kg)	²²⁶ Ra (Bq/kg)	Th (Bq/kg)	²¹⁰ Po (Bq/kg)								
30.07.25	<0.1	0.7	0.4	6.1								
xxv.	<i>Discharges from the treatment plant and settling pits should be constantly monitored for concentration of radio nuclides.</i>	Radiological parameter in treated effluent is done by HPU of BARC. The values of gross alpha (0.4-3.7 Bq/l) and Gross beta (0.5-9.3 Bq/l) in treated effluent during April to September 2025 are within permissible limits (Gross alpha: 3.7 Bq/l and Gross beta 37 Bq/l).										
xxvi.	<i>Sludge from the treatment plant and settling pit shall be transported to the tailing pond in safe containment.</i>	Sludge from treatment plant is transported to tailings pond of Jaduguda for safe containment.										
xxvii.	<i>The project proponent shall have an emergency response plan to ensure that all potentially affected people understand the possible causes and consequences of radiation and other project related activities.</i>	Kindly Refer specific condition no xiii.										
xxviii.	<i>Wet drilling and water spraying on muck should be practiced to reduce generation of silica and low level of radioactivity in the work place. The external radiation dose should be monitored quarterly to ensure that workers engaged in the work place are not over exposed.</i>	Wet drilling & water spraying on working area, waste dump and haul road is practiced to reduce the fugitive dust. Total fugitive dust and external radiation dose is monitored by HPU of BARC. Respirable siliceous dust during April to September 2025 at workplace area of processing plant varies from 0.05 to 0.64 mg/m ³ (Permissible limit 0.80 mg/m ³). The corresponding value of airborne long lived alpha activity in dust is varies from 2.0 to 12.0 mBq/m ³ . Permissible limit for airborne long lived alpha activity is 150 mBq/m ³ .										
xxix.	<i>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</i>	Not applicable. Employees of Jaduguda Mine & Ore Processing Plant reside in Jaduguda Township.										

SL. No.	Specific Condition	Compliance
	<i>care, crèche etc. The housing may be in the form of temporary structures to be removed after the completion of the project.</i>	
xxx.	<i>The critical parameters such as SPM, RSPM, NOx in the ambient air within the impact zone, peak particle velocity at 300m distance or within the nearest habitation, whichever is closer shall be monitored periodically. Further, quality of discharge water shall be monitored [(TDS, DO, PH, Total Suspended Solids (TSS) and radio nuclides]. The monitored data shall be uploaded on the website of the company as well as displayed on a display board at the project site at a suitable location near the main gate of the Company in public domain. The circular No. J-20012/1/2006-IA.II(M) dated 27.05.2009 issued by Ministry of Environment and Forests, which is available on the website of the Ministry www.envfor.nic.in shall also be referred in this regards for compliance.</i>	Digital display board has been installed at the main gate showing readings of Ambient Air Quality, Water Quality, DO and radio nuclides which are access to the public domain. Photograph of the digital display board is attached. Soft copy of monitoring results and compliance report are sent to MoEF&CC. Environmental data, Environmental Statement and compliance report is being uploaded on company's website, www.uraniumcorp.in .
xxxi.	<i>A Final Mine Closure Plan along with details of Corpus Fund should be submitted to the Ministry of Environment & Forests 5 years in advance of final mine closure for approval.</i>	A Final Mine Closure Plan will be submitted to MoEF&CC before 5 years of mine closure.

Sl. No.	General Condition	Compliance
i.	<i>No change in mining technology and scope of working should be made without prior approval of the Ministry of Environment and Forests.</i>	Noted. No change in mining technology & scope of working shall be made without prior approval of the Ministry of Environment & Forest.
ii.	<i>No change in the calendar plan including excavation, quantum of mineral uranium ore and waste should be made.</i>	No change in the calendar plan including excavation and quantum of mineral shall be made.
iii.	<i>Four ambient air quality monitoring stations should be established in the core zone as well as in the buffer zone for RSPM (Particulate matter with size less than 10 micron i.e. PM₁₀) and NOx monitoring. Location of the stations should be decided based on the meteorological data, topographical features and environmentally and ecologically sensitive targets and frequency of monitoring should be undertaken in consultation with State Pollution Control Board.</i>	Four locations of Ambient Air Quality have been identified in core zone & buffer zone based on the meteorological data, topographical feature and environmentally ecological sensitive targets. The ambient air quality monitored at four locations in core and buffer zones in terms of PM ₁₀ , PM _{2.5} , SO ₂ , NO _x and CO parameters are found within the permissible standards. Ambient Air Quality, Noise Level monitored & analyzed by M/s Biocrat Environmental Services LLP, Ranchi.
iv.	<i>Data on ambient air quality RSPM</i>	Ambient air quality has been done. Results are

Sl. No.	General Condition	Compliance
	<i>(Particulate mater with size less than 10 micron i.e. PM₁₀) & NOx should be regularly submitted to the Ministry of Environment Forest including its Regional office located at Bhubaneswar and the State Pollution Control Board / Central Pollution Control Board once in six months.</i>	submitted to Ministry of Environment Forest including its Regional office located at Ranchi and the State Pollution Control Board once in six months.
v.	<i>Fugitive dust emission from all the sources be controlled regularly mentioned and data recorded properly. Water spraying arrangements of haul roads, wagon loading, dumps loading & unloading points should be provided and properly maintained.</i>	Fugitive dust emission is controlled by wet operation of dust extraction system & drilling and water spraying arrangement on haul roads, loading & unloading points. Water tankers with water sprinkling arrangement are used. Fugitive dust is monitored in work zone area. In addition to above, as directed by the ministry on its letter dated 06.09.2022 for further mitigation of dust, fog cannon system has been procured and installed. Photograph is attached.
vi.	<i>Adequate measures should be taken for control of noise levels within prescribed standards. Workers engaged in blasting and drilling operations of HEMM, etc., should be provided with ear plugs/muffs.</i>	Ear muffs/plug have been provided to workers. Total 3050 nos. of PPE have been provided during April to September 2025. HEMM is not applicable to Jaduguda underground mine. Monitoring of noise levels is carried out within premises. All values are within the permissible limits.
vii.	<i>Industrial wastewater (workshop and waste water from the mine) should be properly collected, treated so 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. Oil and grease trap should be installed before discharge of effluents from workshop.</i>	Mine discharge water is pumped to surface and then reused in ore processing plant operations after physical treatment and excess water from ETP is discharge to environment. No water is discharged from mine to the environment.
viii.	<i>Personnel working in dusty areas should wear protective respiratory devices and they should be provided with adequate training and information on safety and health aspects. Occupational health surveillance program of the workers should be undertaken periodically to observe any contractions due to exposure to dust and take corrective measures, if needed.</i>	Personnel working in dust prone area are provided with PPE. Use of PPE is also monitored. Vocational Training Officer (VTO) conducts various programs e.g. initial, refresher, special & development trainings on occupational health & safety and other topics as per the certified schedule of DGMS. Occupational health surveillance: 1. Medical teams visit surrounding villages periodically and medicines are supplied free of cost. 2. Pre employment and Periodical medical examination of all employees for blood test, lung function test, x-ray, audiometric test, ECG & physical tests etc. 3. Medical facility is provided for all employees and their dependent. During April to September 20225, total 225 employees were medically examined and 432 were given vocational training from mine and plant.

Sl. No.	General Condition	Compliance																																																												
ix.	<i>A separate environmental management cell with suitable qualified personnel should be set up under the control of a Senior Executive, who will report directly to the Head of the organization.</i>	Environmental Engineering Cell (EEC) has been set up at Turamdih with suitable qualified personnel. EEC is under direct supervision of General Manager/HOD (Civil & Environment) who report to the Director of the organization. All the environmental management activities related to this project is carried out by EEC. At mines & processing plant, safety meeting is held on monthly basis and members from Health Physics Division, BARC and EEC is present to monitor and address the radiological environmental safety.																																																												
x.	<i>The funds earmarked for environmental protection measures should be kept in separate account and should not be diverted for other purpose. Year wise expenditure should be reported to the Ministry and its Regional Office located at Bhubaneswar.</i>	<div>Expenditure incurred on the environmental protection measures up to March 2025 is Rs. 31,641.62 lakhs. Detail cost of item wise and year wise expenditure is given as under:</div> <table><tr><th>Sl No</th><th>Year</th><th>Activity</th><th>Cost (in Lakhs)</th></tr><tr><td>1</td><td>1988-1989</td><td>ETP/WTP construction & installation</td><td>100.64</td></tr><tr><td>2</td><td>1995-2000</td><td>STP construction & installation</td><td>233.48</td></tr><tr><td>3</td><td></td><td>Installation of scrubber for control of air pollution at OPP</td><td>201.40</td></tr><tr><td>4</td><td></td><td>Ventilation system</td><td>175.92</td></tr><tr><td>5</td><td>Up to 2021</td><td>Capital cost in construction of Tailing Pond</td><td>28903.75</td></tr><tr><td>6</td><td></td><td>DG chimney modification</td><td>20.00</td></tr><tr><td colspan="3">Total Cost (Rs. in Lakhs)</td><td>29,635.19</td></tr></table> <div>Recurring cost for environmental protection measures is given as under:</div> <table><tr><th>Sl No</th><th>Year</th><th>Activity</th><th>Cost (in Lakhs)</th></tr><tr><td>1</td><td>2024-25</td><td>Operation and Maintenance Cost of ETP, WTP & STP</td><td>922.19</td></tr><tr><td>2</td><td>2024-25</td><td>Operation and Maintenance Cost of DE System</td><td>69.40</td></tr><tr><td>3</td><td>2024-25</td><td>Operation and Maintenance Cost of Water Sprinkling by Tankers</td><td>13.61</td></tr><tr><td>4</td><td>2024-25</td><td>Operation and Maintenance Cost of Air Ventilation System</td><td>42.88</td></tr><tr><td>5</td><td>2024-25</td><td>Other Expanses towards environmental protection measure (raw materials like Lime and carbide sludge & Procurement of HEPA Filter and PPE)</td><td>958.35</td></tr><tr><td colspan="3">Total Cost (Rs. in Lakhs)</td><td>2,006.43</td></tr></table>	Sl No	Year	Activity	Cost (in Lakhs)	1	1988-1989	ETP/WTP construction & installation	100.64	2	1995-2000	STP construction & installation	233.48	3		Installation of scrubber for control of air pollution at OPP	201.40	4		Ventilation system	175.92	5	Up to 2021	Capital cost in construction of Tailing Pond	28903.75	6		DG chimney modification	20.00	Total Cost (Rs. in Lakhs)			29,635.19	Sl No	Year	Activity	Cost (in Lakhs)	1	2024-25	Operation and Maintenance Cost of ETP, WTP & STP	922.19	2	2024-25	Operation and Maintenance Cost of DE System	69.40	3	2024-25	Operation and Maintenance Cost of Water Sprinkling by Tankers	13.61	4	2024-25	Operation and Maintenance Cost of Air Ventilation System	42.88	5	2024-25	Other Expanses towards environmental protection measure (raw materials like Lime and carbide sludge & Procurement of HEPA Filter and PPE)	958.35	Total Cost (Rs. in Lakhs)			2,006.43
Sl No	Year	Activity	Cost (in Lakhs)																																																											
1	1988-1989	ETP/WTP construction & installation	100.64																																																											
2	1995-2000	STP construction & installation	233.48																																																											
3		Installation of scrubber for control of air pollution at OPP	201.40																																																											
4		Ventilation system	175.92																																																											
5	Up to 2021	Capital cost in construction of Tailing Pond	28903.75																																																											
6		DG chimney modification	20.00																																																											
Total Cost (Rs. in Lakhs)			29,635.19																																																											
Sl No	Year	Activity	Cost (in Lakhs)																																																											
1	2024-25	Operation and Maintenance Cost of ETP, WTP & STP	922.19																																																											
2	2024-25	Operation and Maintenance Cost of DE System	69.40																																																											
3	2024-25	Operation and Maintenance Cost of Water Sprinkling by Tankers	13.61																																																											
4	2024-25	Operation and Maintenance Cost of Air Ventilation System	42.88																																																											
5	2024-25	Other Expanses towards environmental protection measure (raw materials like Lime and carbide sludge & Procurement of HEPA Filter and PPE)	958.35																																																											
Total Cost (Rs. in Lakhs)			2,006.43																																																											
xi.	<i>The project authorities should inform to the Regional Office located at Bhubaneswar regarding date of financial closures and final approval of the project by the concerned authorities and the date of start of land development work.</i>	The competent authority has approved the financial sanction for capacity enhancement. Land development work for enhancement of production is not applicable as no additional land has been envisaged. Only rate of production of the existing ore processing plant will be enhanced.																																																												
xii.	<i>The Regional Office of this Ministry located at Bhubaneswar shall monitor compliance of the stipulated conditions. The project</i>	Uranium Corporation of India Ltd. is committed to take action of any requirement/suggestion of the Ministry for safeguard of environment. We																																																												

Sl. No.	General Condition	Compliance
	<i>authorities should extend full cooperation to the officer (s) of the Regional Office by furnishing the requisite data / information / monitoring reports.</i>	extend our full cooperation to officials of Regional Office of MoEFCC, Ranchi during their visit.
xiii.	<i>The project proponent shall submit six monthly report on the status of compliance of the stipulated environmental clearance conditions including results of monitored data (both in hard copies as well as by e-mail) to the Ministry of Environment and Forest, its Regional Office Bhubaneswar, the respective zonal office of Central Pollution Control Board and State Pollution Control Board. The proponent shall upload the status of compliance of of the environmental clearance conditions, including results of monitored data on their website and shall update the same periodically. It shall simultaneously be sent to the Regional Office of the Ministry of Environment and Forests, Bhubaneswar, the respective zonal office of Central Pollution Control Board and the State Pollution Control Board.</i>	Being Complied.
xiv.	<i>A copy of clearance letter will be marked to concerned Panchayat, Zila Parisad / Municipal Corporation, 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.</i>	Copy of EC has been submitted to Zila Parishad and Panchayat vide our letter nos. UCIL/ENV/GEN/MoEFCC/02/2022 dated 22.07.2022 and UCIL/ENV/GEN/MoEFCC/03/2022 dated 06.08.2022.
xv.	<i>State Pollution Control Board should display a copy of the clearance letter at the Regional office, District Industry Centre and Collector's office/ Tehsildar's Office for 30 days.</i>	Complied with by State Pollution Control Board, Ranchi.
xvi.	<i>The environmental statement for each financial year ending 31st 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 clearance conditions and shall also be sent to the Regional Office of the Ministry of Environment and Forest, Bhubaneswar by</i>	The environmental statement is being sent to Jharkhand State Pollution Control Board. The status of six monthly compliance reports of environmental clearance conditions is being sent to JSPCB and the Regional Office of the Ministry of Environment and Forest, Ranchi by e-mail and the same has been uploaded in UCIL website.

Sl. No.	General Condition	Compliance
	<i>e-mail.</i>	
xvii.	<i>The project authorities should advertise at least in two local newspapers of the District or State in which project is located and widely circulated, one of which shall be in the vernacular language of the locality concerned, within 7 days of the issue of the clearance letter informing that the project has been accorded environmental clearance and a copy of the clearance letter is available with the State Pollution Control Board and also at web site of the Ministry of Environment and Forests at http://envfor.nic.in and a copy of the same should be forwarded to the Regional Office of this Ministry located Bhubaneswar.</i>	Advertise was published in two local newspapers namely Hindustan Times and Uditvani dated 21 st May 2011 which are widely circulated in the area. A copy of the clearance letter was made available to the State Pollution Control Board.

Photograph of water sprinklers at ore handling area



Photographs showing conditioning of the ore with water at the unloading of the ore



Photograph of the existing greenbelt and plantation



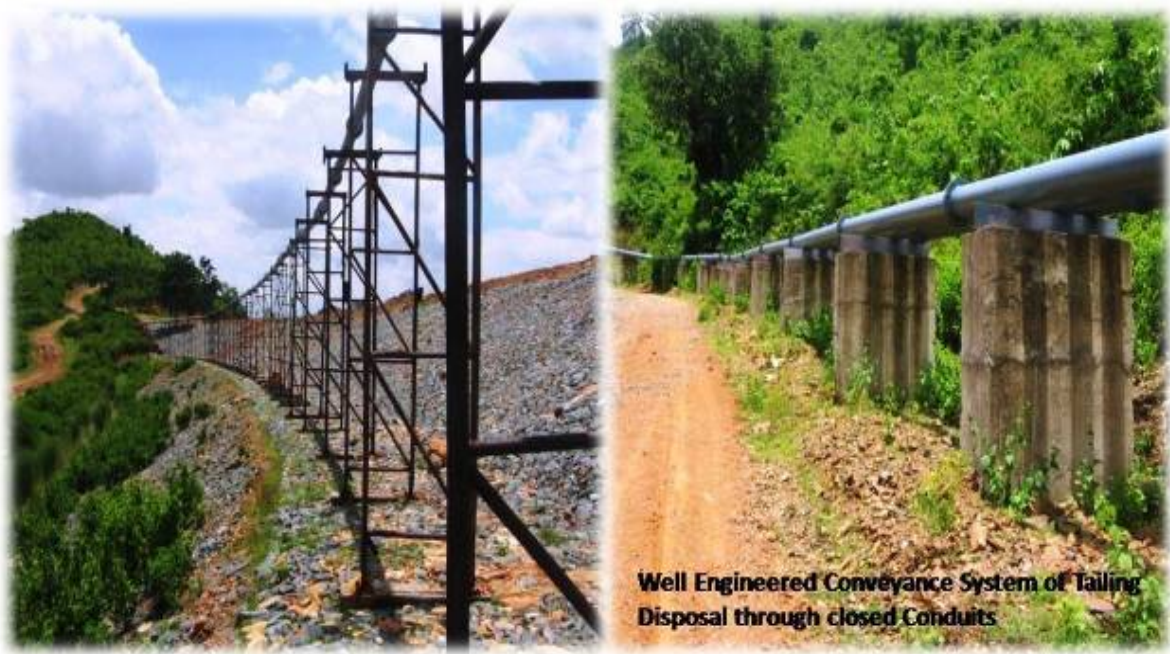
Panaromic view of greenbelt and plantation is shown in the photograph attached below.







Photograph of fog cannon system at Jaduguda



Conveyance System for Tailings



Effluent Treatment Plant at Jaduguda

Rain Water Harvesting Structures

- i. Located at Jaduguda Hospital



- ii. Located at Jaduguda Township



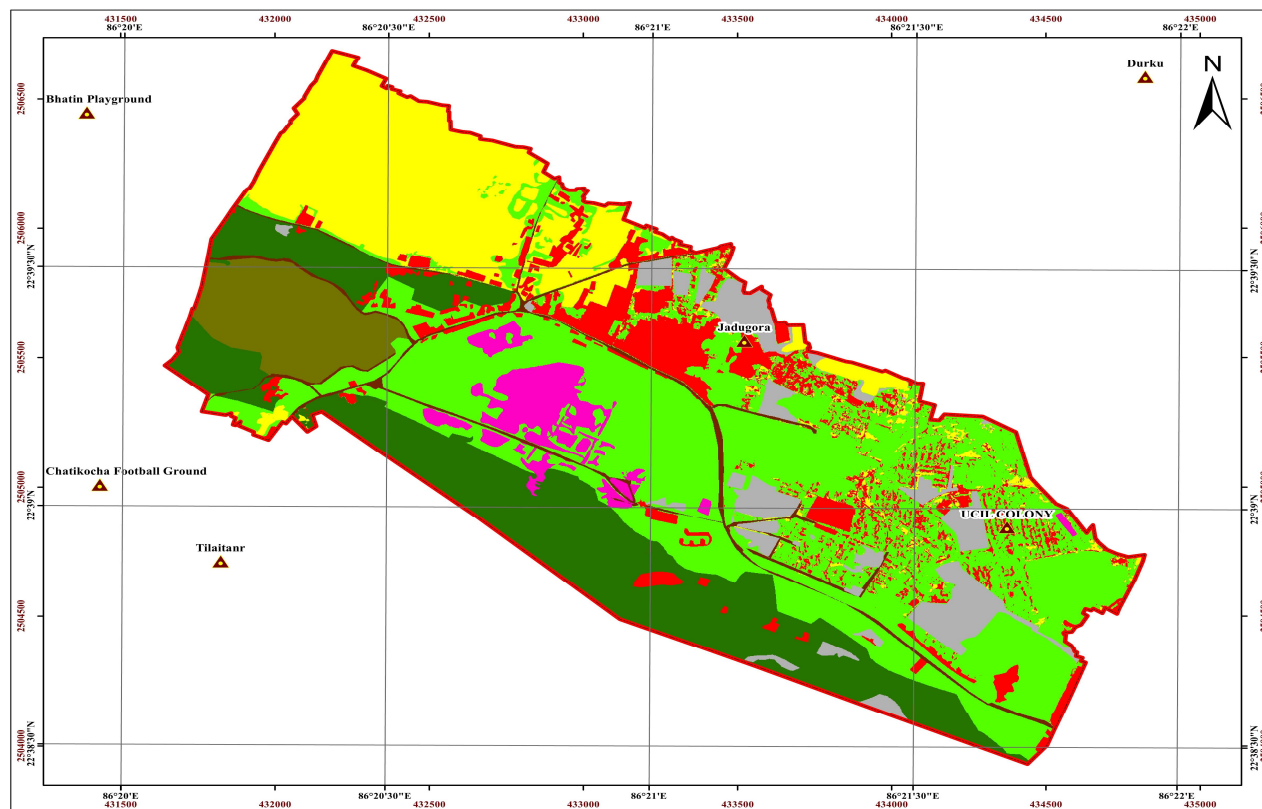
- iii. Located at Health Physics Unit, Jaduguda



Photographs of vehicle used for Ore transportation



Land Use Land Cover Map for Jaduguda Mine Lease Area



0.5 0.25 0 0.5 1
Kilometers

1:10,000

THIS DRAWING IS THE PROPERTY OF UCIL AND IS ISSUED FOR THE SPECIFIC PROJECT MENTIONED THEREIN, THIS IS NOT TO BE COPIED OR USED FOR OTHER PROJECTS UNLESS EXPRESSLY PERMITTED BY UCIL

REFERENCES :
SATELLITE IMAGE CARTOSAT-2S
SPATIAL RESOLUTION 1.6m
IMAGERY DATE : 26 - MAY - 2023

© Uranium Corporation of India Limited (UCIL)

Preparation of Land Use / Land Cover Map of Jaduguda Mine Lease Area using Remote Sensing Techniques

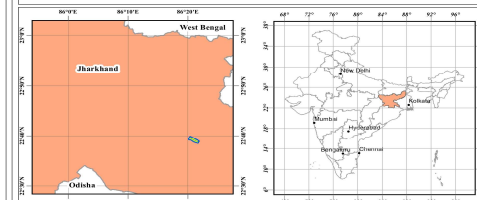
Uranium Corporation of India Limited (UCIL)

(A Government of India Enterprise)
(CIN:U 12000 JH 1967 GOI 000806)
Singbhum East, Jharkhand - 832102



Project Implementing Agency (PIA) :

Geovale Services Private Limited
GN 38/5, 3rd Floor, Sector V, Salt Lake,
Kolkata, West Bengal - 700091



LEGEND

	Area (Ha)
Jaduguda Mine Lease Area	388.23
Known Locations	
Greenbelt / Plantation	141.68
Forest	74.43
Agricultural Land	66.41
Settlements	37.39
Open Land / Barren Land	25.71
Tailing Pond	20.84
Industrial Establishment	13.47
Infrastructure (Road)	8.30

Uranium Corporation of India Limited (UCIL)
(A Govt. of India Enterprise, Dept. of Atomic Energy)
Jaduguda Mine Lease Area

Drawn by	Name & Designation	Rabiya Parween, Geospatial Scientist
Signature		<i>Rabiya Parween</i>
Checked & Verified by	Name & Designation	Sujay Payra, Project Manager
Signature		<i>Sujay Payra</i>
Approved by	Name & Designation	Biplab Chatterjee, CEO
Signature		<i>Biplab Chatterjee</i> 21.05.2025

Fourier transform of a rectangular pulse function

Q1) Find the Fourier transform of the rectangular pulse function

Sol)

$$f(x) = \begin{cases} 1 & -1 \leq x \leq 1 \\ 0 & \text{elsewhere} \end{cases}$$

Ans) We know that

$$F(\omega) = \int_{-\infty}^{\infty} f(x) e^{-j\omega x} dx$$

Substituting the value of $f(x)$ in the above equation

$$F(\omega) = \int_{-1}^{1} 1 \cdot e^{-j\omega x} dx$$

$$= \int_{-1}^{1} e^{-j\omega x} dx$$

$$= \left[\frac{e^{-j\omega x}}{-j\omega} \right]_{-1}^{1}$$

$$= \frac{1}{-j\omega} \left[e^{-j\omega \cdot 1} - e^{-j\omega \cdot (-1)} \right]$$

$$= \frac{1}{-j\omega} \left[e^{-j\omega} - e^{j\omega} \right]$$

$$= \frac{1}{-j\omega} \left[-2j \sin \omega \right]$$

$$= \frac{2 \sin \omega}{\omega}$$

Hence, the Fourier transform of the rectangular pulse function is $\frac{2 \sin \omega}{\omega}$.

Information related to Air, Water and Hazardous waste management

S. No.	Production Details	Details of Hazardous Chemicals used with quantity and purpose	Type of HW generated with category as per HCHWM Rules, 2016	Quantity of HW generated, stored and disposed	Mode of treatment and disposal/Pre-processing, Co-processing, recycling / Utilizing / reuse/ Sl/Incinerator etc.
1	Classified Information under Atomic Energy Act, 1982	i) Sulphuric Acid: 10000 T/Annun, used in process ii) Arsenic trioxide: 84 T/Annun, used in process, iii) Hydrogen Peroxide: 800 T/Annun, used in process, iv) Caustic Soda: 63 T/Annun, used in process	Used for lab/traffing Oil [Schedule 1, Cat 5-1]	6.176 T/Annun Generated [2024-25] Quantity Sold [2024-25] Quantity stored as on 31.03.2025	Used for Lubricating oil is sold to fine Aut/boiled Mill Recycle through Aurilian 7.725 MT

Information related to Air, Water and Hazardous waste generation

Parameters Monitored w.r.t. Ambient Air Pollution (PM₁₀, CO, SO₂, NO_x etc.)

Date of Monitoring ~ 24.12.2023

Sr. No.	Parameters	Near AD Building	Near Guest House Adjacent to Colony	Near UCL Barrage	Near Clubhouse a Village	1/limit/ Standard prescribed by CPCB/CrCB
1	PM ₁₀ (µg/m ³)	70.55	63.69	75.85	66.45	100 µg/m ³
2	PM _{2.5} (µg/m ³)	88.94	81.09	87.80	29.01	60 µg/m ³
3	SO ₂ (µg/m ³)	08.27	06.39	09.58	07.22	80 µg/m ³
4	NO _x (µg/m ³)	20.68	15.06	22.95	12.87	80 µg/m ³
5	CO (mg/m ³)	<1.15	<1.15	<1.15	<1.15	2.0 mg/m ³

***OCEMS Connectivity details (Date of installation and operational status):**

22 of 22