

1. NOAMUNDI IRON MINE, M/s TATA STEEL LTD

Tata Steel Limited holds the Noamundi lease over an area of 1160.06 ha in West Singhbhum District of Jharkhand and is being worked for winning of iron ore having a capacity to produce 10.00 million tonnes per annum of Iron ore. Mechanized method of open cast mining adopted for mining iron ore in a series of 12 m high benches with the help of shovel-dumper combination. The company is having a full-fledged Environment Management Department to take care of all environmental aspects of different mines. Best practices followed in this mine are elaborated in the following paragraphs.

- ❖ **Mineral Conservation:** Conservation of insitu mineral is being achieved with the use of SURPAC Software which is utilised for preparation 3-D ore body model, pit digning, production scheduling. This software provides quantitative and qualitative data in 3-D on geology, ore grades etc.

- ❖ **Solid Waste Management:**
 - Wastes generated during the process used for road making and haul road maintenance.
 - The excess quantity of over burden is stacked separately over non-mineralized area. The sub grade ore is used by blending the same with richer ore to achieve mineral conservation.
 - The excess quantity is being stored separately as subgrade stack for future use. The Slime from the ore washing plant isseparately stored in zero discharge slime dam for possible future use.
 - Reclamation and rehabilitation plan has been established.
 - All the inactive dump slopes, slopes of embankment and dams etc. have been stabilized by planting grass/trees.

- ❖ **Effective Ore Handling Plants:**

In Noamundi Iron Mine, two beneficiation circuits wet and dry are in operation Another step taken towards mineral conservation is the installation of Jigging plant and Hydro cyclone in the wet process for further beneficiation of Iron ore to recover iron values from fines. Installation of Jigging Plant helps to improve the recovery of process-able Iron ore from the mineral rejects in the iron ore washings. The Jigging plant for Iron ore fines is the first of its kind in India.

- ❖ **Water Quality**

The only source of water within the lease area is the Balijhore nallah. During monsoon, mine wash-off from pits will be arrested by series of check dams proposed on the downstream side and only clear water will leave from lease boundary. The different measure have been taken for control of water pollution and conservation as under:

 - Recycle and reuse of process water generated from the wet beneficiation plant by provision of two thickeners.

 - Construction of zero discharge slime dams, where the under flow from the thickeners is pumped to and decanted water from the dam is again recycled from the pond, leaving the solids there.



The Slime from the ore washing plant is separately stored in zero discharge slime dam for possible future use.

- The addition of chemicals for faster settling of suspended solids also binds the sludge and hence, increases life of the slime dam.
- Construction of rain water harvesting structures for use of rain water and augmentation of ground water table.

- Construction of series of check dams across the water courses those enable retention of suspended solids and allow flow of clear water during rainy season.
- Stabilization of waste dump slopes by timely vegetation with native species to prevent wash offs during rain. A total of 19,13,366 nos. of saplings have been planted since beginning, to develop green belts in and around the mining lease area.
- Waste dumps are provided with toe walls and garland drains, that arrest washed off solids from the dumps and prevents the outside water source from pollution.
- Oil & Grease traps in the equipment workshop have been provided to trap oil & grease from the workshop effluent and the water is again reused for washing of vehicles and the oil so collected is handed over to authorized recyclers for reuse.
- Actiflo clarifier (micro sand ballasted technology) with pressure sand filter has been installed for treatment of Drinking water system. The filtered water is supplied to the inhabitants of the colony. The quality of the drinking continues to improve and it meets the WHO standard.
- Mining operation is limited on hill slopes and above the ground water table. Hence, there is no intersection of ground water table and hence no depletion of water table occurs because of our mining operation.
- The beneficiation process does not use any chemicals and hence there is no likelihood of any chemical contamination of water bodies due to the mining activities. Domestic discharges from the residence of the employees are treated in septic tanks and their overflows reach soak pits, which later get percolated in earth.

Reclamation & Rehabilitation of Mined out Areas:

- A total of 1918366 saplings planted inside the lease, over an area of 365.765 ha.
- Afforestation has been done on 126 ha of mined out benches of Hill 1&2.
- A mined out area of 18 ha (old Quarry) has been developed in 1991 into a scenic park named as Sir Dorabji Tata Botanical Park. An amount of about Rs 60 Lakhs is spent annually for maintenance and upkeep of the parks, gardens and greeneries.

- Part of the western pit (about 33 ha) of area which has been mined out is being backfilled with slime generated from wet processing.
- The southern part of Hill-4, where the benches have reached the ultimate pit limits is being backfilled.
- A mined out pit of about 13 ha area on the western ridge has been rehabilitated into a zero discharge slime dam serving as slime storage hence, saving additional land requirement.
- A total of 1918366 saplings have been planted inside the lease, over an area of 365.765 ha.
- Solar light in use.

Rain Water Harvesting System:

To catch surface runoff water from hills and augment the ground water, rain water harvesting structures and ground water recharge system constructed during 2010-11. This system has comparatively reduced the dependency of Noamundi Iron Mine on water from the river. Moreover, towards maximization of rain water harvesting and augmentation of ground water resources, a detailed study of the entire lease area was conducted during 2007. The study revealed that there is a potential of harvesting 1.82 million KL per annum of rain water from a



Rain water harvesting at Noamundi

catchment area of 392 ha within the lease area. Two numbers of Rain water harvesting structures have been constructed within the lease area of Noamundi across the Balijhore Nallah passing through the lease.

Dump plantation:

(i) Method of pitting & planting

Reclamation in the worked out mining benches are done by making pits 1.5 ft x 1.5 ft x 1.5 ft size with 6 ft apart and filling the pits with sweet earth, sand and cow dung. Neem cake powder is also applied in the pit to protect the plants from white ants. Such ground preparations are completed before monsoon, and appropriate varieties of sapling are planted during the monsoon. During post monsoon the weeds are cleared from the planted area and manures are applied to ensure healthy growth of the plant and to enhance the rate of survival. The planted area is fenced with wooden posts and barbed wire to protect the plants from cattle grazing and destruction. Watch and ward personnel are posted in vulnerable area to safeguard the plants.



(ii) Method of planting by contour trenching

On the long slopes, contour trenches are dug at 3 m interval along the contours. The excavated earth is stacked on the edge of the trench on the lower slope side to arrest the water flow that comes due to rains and accumulates on the trenches and gradually seeps through the strata enabling the planted saplings to get water and nutrients regularly to ensure healthy growth

Plantation in mined out area of hill1&2

❖ **Environmental Monitoring:**

An in-house Environmental Management cell has been developed in the year 1992 to carry out environmental quality monitoring,

❖ **Scientific Studies:**

Various scientific studies have been undertaken by the mine management, with research institutions like CIMFR, IIFM, CSME, Calcutta University, RRL & IIT, Kharagpur for keeping abreast in safe blasting practices, biological resources management, study on underground water quality, study on aquatic life, study on carbon sequestration etc.